Project Dissertation Report
on

ANALYZING INDIAN CRICKET TEAM'S DATA POST 1 JAN,2000

Submitted by

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CERTIFICATE

This is to certify that the work titled **'Analyzing Indian cricket team's data post 1 January, 2000** as part of the final year Major Research Project submitted by Ashish Tomar in the 4th Semester of MBA, Delhi School of Management, Delhi Technological University during January-May 2021 is his original work and has not been submitted anywhere else for the award of any credits/ degree whatsoever.

The project is submitted to Delhi School of Management, Delhi Technological University in partial fulfillment of the requirement for the award of the degree of Master of Business Administration.

Prof. Abhinav Chaudhary
Faculty Advisor

Prof. Rajan Yadav
Head of Department (DSM, DTU)

DECLARATION

I hereby declare that the work titled **'Analyzing Indian cricket team's data post 1 j**
January, 2000" as part of the final year Major Research Project submitted by me in the 4th Semester of MBA, Delhi School of Management, Delhi Technological University, during January-May 2020 under the guidance of Prof. Abhinav Chaudhary is my original work and has not been submitted anywhere else.

The report has been written by me in my own words and not copied from elsewhere. Anything that appears in this report which is not my original work has been duly and appropriately referred/ cited/ acknowledged.

Ashish Tomar

(Roll No 2K19/MBA/023)

ACKNOWLEDGMENT

It is a great pleasure for me to acknowledge the kind of help and guidance received during the research work. I would like to thank my faculty advisor Prof. Abhinav Chaudhary, who helped me to take up the topic **'Analyzing Indian cricket team's data post 1 jan, 2000"** and guided me to complete this project properly. The project provided me with an excellent opportunity to explore the areas of sports and Analytics.

I am highly indebted to Delhi School of Management, Delhi Technological University for giving me an opportunity to work on this project. Lastly, I would like to express my gratitude to all the honorable faculty members for sharing their experience and expertise on this project.

I have put all my efforts to ensure that the project is completed in the best possible manner and also ensured that the project is error-free.

Ashish Tomar

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ABSTRACT

Indian cricket team represents Republic of India in international cricket in all three formats of t-20, ODIs and test cricket. India is a full and permanent member of ICC and enjoys test status along with 11 other countries.

This report attempts to inspect and explain various factors which affect Indian team's performance. For this, the data in ODI cricket team since 1 Jan, 2000 has been used. The reason to select data only post 1 Jan, 2000 is arbitrary to an extent, but also because of the fact that it was only post 1999 world cup and 2000 match fixing scandal, I have started to watch and follow Indian cricket very closely and these two events are popularly considered as transition points in Indian cricket team's conquest, especially with the appointment of Saurav Ganguly as the captain of Indian cricket team's captain.

The report focuses on the outcome of data analysis done on the data collected, based on various parameters. The report focuses on asking precise questions like "does parameter A, parameter B etc. and their combination in some form, bear any effect on Indian team and opposition team's performance and statistics?".

Cricket being a statistic heavy sport, the number of questions and enquiries which can be made while analyzing data are literally countless, but still, this report focuses on focusing on as making many enquiries into data as possible by putting one into the shoes of a sports, or more specifically a cricket statistician.

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Chapter 1

INTRODUCTION

Indian cricket team falls under the ambit of BCCI (Board of control for cricket in India). Cricket was introduced to Indian subcontinent by British during imperial era. Indian cricket team played its international match on 25 June, 1932 at Lord's cricket ground against England. At the time it was the sixth ever country to play international cricket or more specifically test cricket, which was the only cricket format used to be played at the time. It was in 1952, almost 20 years after their international debut that Indian team managed to win their first match. The match was plated on their home soil against Pakistan in Lucknow.

1.1 Introduction to one day international (ODI) cricket

ODI cricket started to be played since 1971. Indian team was considered a weak team in ODI cricket in initial years. There are various explanations for the same, but the most fundamental reason for Indian team's poor performance in ODI cricket in initial days was the defensive mindset and style of play adopted by the team. Indian team basically played ODI cricket as an extension of test cricket into a 60 over format (ODI's used be of 60 overs initially).

Indian team's poor performance during their initial foray into ODI cricket is evident from the fact that they even failed to advance beyond the group stages in first two world cups in 1975 and 1979. This was in stark contrast to their performance in test cricket during those times where they were regarded as pretty strong side at home to contend with and were a reasonably strong side with their performances abroad.

Then came arguably the biggest turning event in the history of Indian cricket and also world cricket in 1983 world cup where India, who were still considered underdogs in ODI cricket, managed to defeat West Indies, the winners of first two world cups in 1975 and 1979 and the world's strongest cricket team by a distance, in the finals of 1983 world cup and win the tournament. This event turned Indian as well as world cricket on its head and made cricket the most popular sport in India. Till then it was field hockey which used to dominate the psyche of Indian people but since then Indian cricket hasn't looked back at least in the terms of popularity and following in India and across the world in Indian diaspora.
Then came the lowest moment in Indian cricket so far. The match fixing scandal of 2000 where top players like Mohd. Azharuddin, Ajay Jadeja, Nayan Mongia were found guilty of being involved in match fixing and were served life bans from sport.
Saurav Ganguly was handed over the command of the team and he went on to create a strong Indian cricket team by incorporating many youngsters like Virender Sehwag, Harbhajan Singh, Zaheer Khan, VVS Laxman, Ashish Nehra, Mohd. Kaif, Yuvraj Singh etc. around the nucleus of already established players like- Sachin Tendulkar, Rahul Dravid, Anil Kumble, Ganguly himself, and Javagal Srinath.

1.2 Objectives of the Research

The major objectives for carrying out the research work are to interrogate these aspects:-

1. Overall performance of the team.
2. Performance of the team in d/n matches.
3. Performance of the team in day matches.
4. Comparison of team's performance in overall, d/n & day matches.
5. Toss results for India in overall matches.
6. Overall patter of team's decision after winning the toss.
7. Overall pattern of team's decision after winning the toss depending on whether it's a day or day-night match.
8. Overall pattern of team's decision after winning the toss depending on whether the match is taking place in Asia or in SENA (South Africa, England, Australia, New Zealand) countries.
9. Overall pattern of team's decision after winning the toss depending on the number of all-rounders Indian team is playing in the match.
10. Overall pattern of team's decision after winning the toss depending on the number of specialist bowlers Indian team is playing in the match.
11. Overall pattern of team's decision after winning the toss depending on the number of specialist batsmen Indian team is playing in the match.
12. How does the number of specialist bowlers fielded by Indian team affect the outcome of the match for India?

13. How does the number of specialist batsmen fielded by Indian team affect the outcome of the match for India?
14. How does the number of specialist bowlers fielded by Indian team affect the outcome of the match in SENA countries?
15. How does the number of specialist bowlers fielded by Indian team affect the outcome of the match in Asian countries?
16. How does the number of specialist batsmen fielded by Indian team affect the outcome of the match in SENA countries?
17. How does the number of specialist batsmen fielded by Indian team affect the outcome of the match in Asian countries?
18. How does the number of all-rounders fielded by Indian team affect the outcome of the match for India?
19. How does the number of all-rounders fielded by Indian team affect the outcome of the match in SENA countries?
20. How does the number of all-rounders fielded by Indian team affect the outcome of the match in Asian countries?
21. How does the number of specialist bowlers fielded by Indian team affect the eventual runs scored and wickets lost by opposition team when they bat first?
22. How does the number of specialist batsmen fielded by Indian team affect the eventual score and wickets lost by Indian team when they bat first?
23. How does the number of all-rounders fielded by India affect the score of Indian team?
24. How does the number of specialist batsmen fielded by India affect the outcome of the match for India when they are chasing?
25. What is the overall average number of bowlers and the type of bowlers Indian team fields against SENA and Asian countries?
26. What is the number of matches played by various combination of bowlers?
27. How does the various combinations of bowlers and the type of bowlers Indian team fields affect the outcome of the match?
28. How does the various combinations of bowlers and the type of bowlers Indian team fields in SENA countries affect the outcome of the match?
29. What is India's overall record against test playing nations since 1 January, 2000 in ODI cricket?
30. What is India's home record against test playing nations since 1 January, 2000 in ODI cricket?
31. What is India's away record against test playing nations since 1 January, 2000 in ODI cricket?

32. What is India's neutral venue record against test playing nations since 1 January, 2000 in ODI cricket?
33. How does an Indian bowler taking 5+ wickets in an innings affect the overall result for India?

Above are some of the inspections that are being made into the data. With cricket being a very statistically heavy sport, the number and type of inspections into the data can be huge and there is hardly a limit on it.

1.3 Scope of the Research

The data which is being used for analysis is only for post 1 January, 2000 era, thus making it an analysis into the Indian team's ODI data in 3rd millennium. The data pre 1 January, 2000 has not been selected for arbitrary reasons which have been explained earlier.

Chapter 2

DATA DESCRIPTION

The data has been collected from espncricinfo website. The data includes all the matches played by India where a valid result (win, loss or tie) has been achieved, meaning, matches which were abandoned, cancelled or washed out have been excluded from the data. Here is the composition of the dataset on which this report is based on:-

1. **Team: - This** column includes the name of the team for which the data is. Thus it has content value = "India".
2. **Match result for India:** - This column describes the match result for India. It's a categorical variable and has only three possible value, 1) "won", 2) "lost, 3) "tied".
3. **Margin: -** This value depicts the margin of result for Indian team. It is a numerical value which describes the result margin. The margin can either be in terms of wickets or runs, depending upon the nature of result for India and India's batting turn in the match. Tied matches are marked with margin = 0 runs, because a tied result is irrespective of number of wickets to fall for either team and solely depends on the fact that both teams ended up scoring equal number of runs eventually.
4. **Margin in wickets: -** This column store logical values i.e. "TRUE" or "FALSE". It describes the nature of the margin column's value. The value is set to "TRUE" when the nature of the margin

of result is in terms of wickets, which happens when 1) Indian team wins when chasing, 2) opposition team wins when chasing. The value is set to "FALSE" when 1) Indian team wins batting first 2) opposition team wins batting first.

5. **Margin in runs: -** This column store logical values i.e. "TRUE" or "FALSE". It describes the nature of the margin column's value. The value is set to "TRUE" when the nature of the margin of result is in terms of runs, which happens when 1) Indian team wins when batting first, 2) opposition team wins when batting first. The value is set to "FALSE" when 1) Indian team wins batting second 2) opposition team wins batting second.
6. **Toss result for India: -** This column stores the toss result for Indian team. It's a categorical variable and has only two possible value 1)"won", 2)"lost".
7. **Batting turn: -** This column stores the value "1st" for cases where India batted first in the match and "2nd" when India batted second in the match.
8. **Opposition: -** This column stores the name of the opposition team.
9. **Host country: -** This column stores the host country's name. In the case of England, Scotland, Northern Ireland and Wales the value "uk" is used, thus denoting United Kingdom. In the case of Antigua & Barbuda Barbados, Dominica, Grenada, Guyana, Jamaica, Saint Lucia, Saint Vincent and Grenadines, Trinidad and Tobago, St. Kitts and Nevis, Anguilla, Montserrat, British Virgin Islands, Saint Marteen, US Virgin Islands we use the value "West Indies".
10. **Date: -** It stores the date when match took place.
11. **D/N Match: -** it stores the logical values of "TRUE" and "FALSE". If the match was a day-night match, the value is set to "TRUE" and when not, it's set to "FALSE".
12. **Day match: -** It stores the logical values of "TRUE" and "FALSE". The value is set to "TRUE" if it's a day match and when not, it's set to "FALSE".
13. **Home: -** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if the match took place in India and it's set to "FALSE" otherwise.
14. **Away: -** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if the match didn't take place in India and it's set to "FALSE" otherwise.
15. **Neutral: -** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if the match took place at a neutral venue and it's set to "FALSE" otherwise.
16. **SENA Host (Y/N):-** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if the match took place at a SENA venue and it's set to "FALSE" otherwise.
17. **Asia Host (Y/N):-** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if the match took place at an Asian venue and it's set to "FALSE" otherwise.
18. **SENA opposition: -** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if the opposition was a SENA country and it's set to "FALSE" otherwise.
19. **Asian opposition: -** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if the opposition was an Asian country and it's set to "FALSE" otherwise.
20. **No of batsmen: -** It stores the number of specialist batsmen fielded by the Indian team.
21. **No of bowlers: -** It stores the number of specialist bowlers fielded by the Indian team.
22. **No of spinners: -** It stores the number of specialist spinners fielded by the Indian team.
23. **No of pacers: -** It stores the number of specialist fast bowlers fielded by the Indian team.
24. **Total all-rounders:-** It stores the number of all-rounders fielded by the Indian team.
25. **No of spin all-rounders:-** It stores the number of spin all-rounders fielded by the Indian team.
26. **No of fast all-rounders:-** It stores the number of fast bowling or medium pace (basically seamers) all-rounders fielded by the Indian team.

27. **India runs: -** It stores the number of runs scored by Indian team.
28. **India wickets lost: -** It stores the number of wickets lost by Indian team.
29. **Opposition runs: -** It stores the number of runs scored by opposition team.
30. **Opposition wickets lost: -** It stores the number of wickets lost by opposition team.
31. **100s by Indian batsmen: -** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if the at least 1 Indian batsmen scores a century in the match and it's set to "FALSE" otherwise.
32. **No of 100s by Indian batsmen: -** It stores the number of Indian batsmen scoring a century in the match.
33. **Indian bowler taking 5+ wickets: -** It stores the logical values of "TRUE" and "FALSE". The values is set to "TRUE" if an Indian bowler takes at least 5 wickets in the match and it's set to "FALSE" otherwise.
34. **Against Australia: -** its value is set to "TRUE" if the opposition was Australia and to "FALSE" if otherwise.
35. **Against Bangladesh: -** its value is set to "TRUE" if the opposition was Bangladesh and to "FALSE" if otherwise.
36. **Against England: -** its value is set to "TRUE" if the opposition was England and to "FALSE" if otherwise.
37. **Against New Zealand: -** its value is set to "TRUE" if the opposition was New Zealand and to "FALSE" if otherwise.
38. **Against Pakistan: -** its value is set to "TRUE" if the opposition was Pakistan and to "FALSE" if otherwise.
39. **Against South Africa: -** its value is set to "TRUE" if the opposition was South Africa and to "FALSE" if otherwise.
40. **Against Sri Lanka: -** its value is set to "TRUE" if the opposition was Sri Lanka and to "FALSE" if otherwise.
41. **Against West Indies: -** its value is set to "TRUE" if the opposition was West Indies and to "FALSE" if otherwise.
42. **Against Zimbabwe: -** its value is set to "TRUE" if the opposition was Zimbabwe and to "FALSE" if otherwise.

Chapter 3
DATA ANALYSIS

To conduct data analysis for ths report, Rstudio is used. The outcome of the data analysis is as follows:-

1. **Overall performance of the team :-.**

Total number of matches played by India= 545.

Number of matches won by India= 323.

Number of matches lost by India= 216.

Number of matches tied by India= 6.

Percentage of matches won by India= (Number of matches won by India)/ (Total number of matches played by India)*100

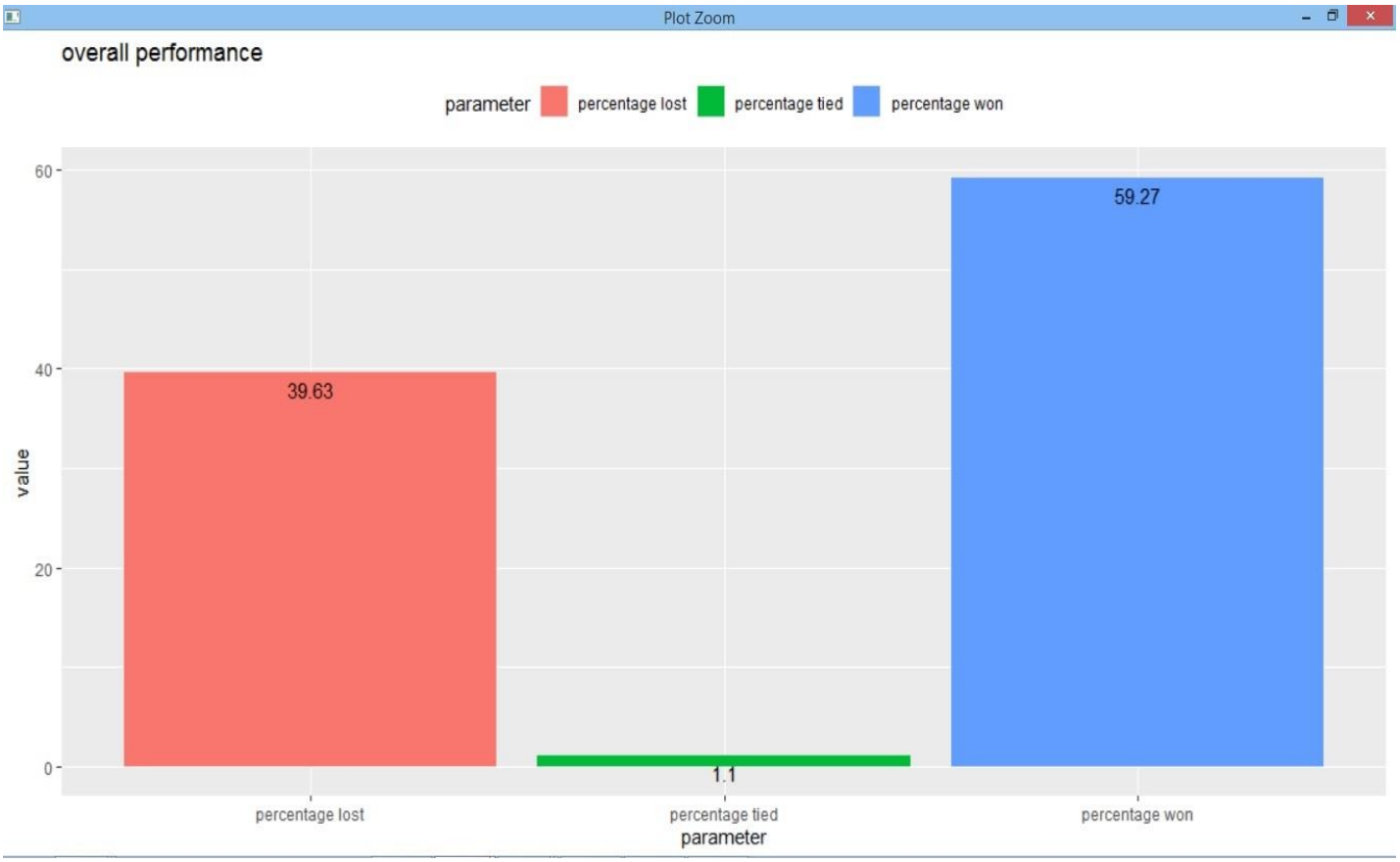
= 59.26606%.

Percentage of matches lost by India= (Number of matches lost by India)/ (Total number of matches played by India)*100

= 39.63303%.

Percentage of matches tied by India= (Number of matches tied by India)/ (Total number of matches played by India)*100

= 1.100917%.



2. Team's performance in day-night matches :-

Total number of d/n matches played by India= 325.

Number of d/n matches won by India= 189.

Number of d/n matches lost by India= 132.

Number of d/n matches tied by India= 4.

Percentage of d/n matches won by India= (Number of d/n matches won by India)/ (Total number of d/n matches played by India)*100

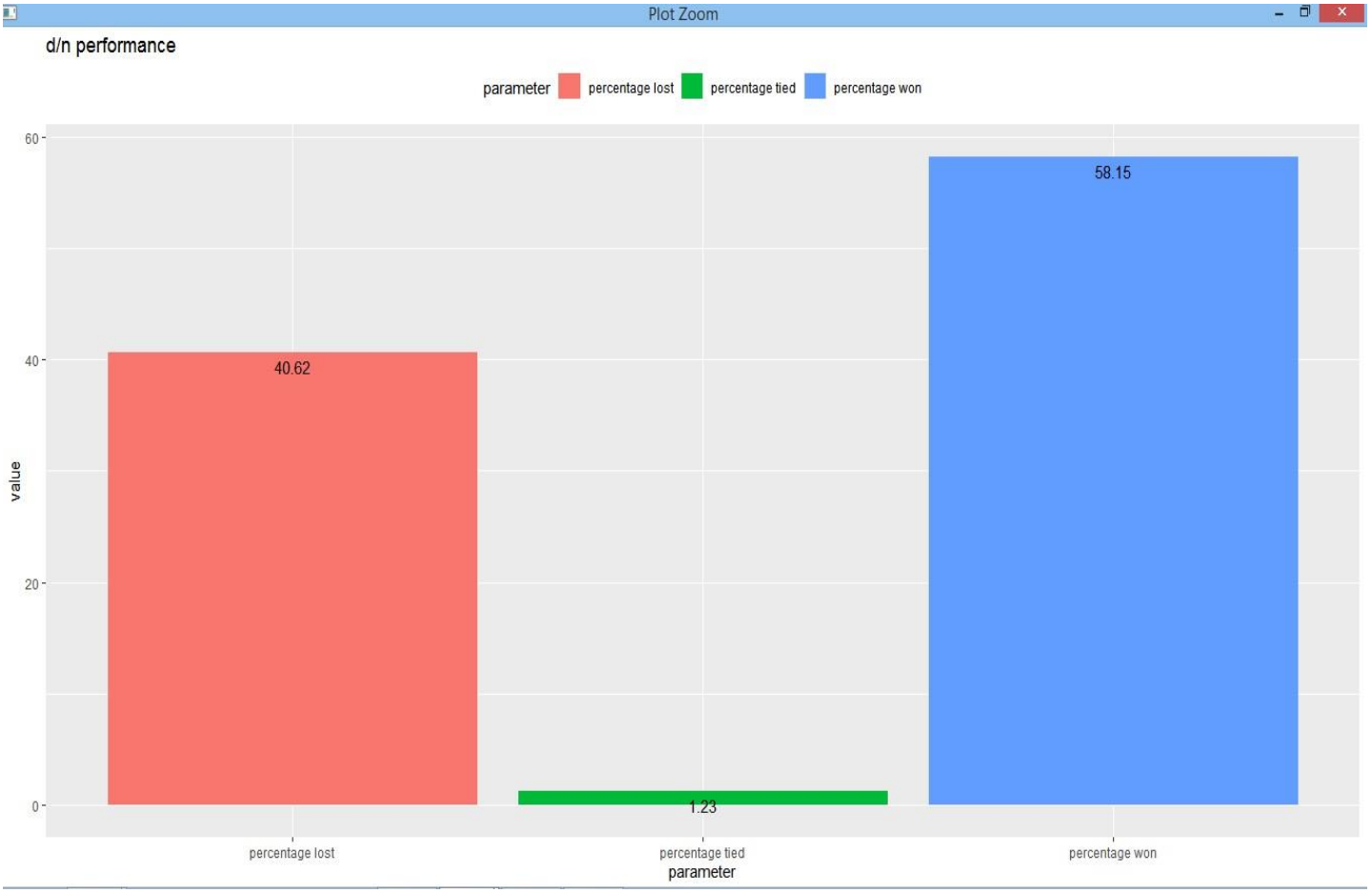
= 58.15385%

Percentage of d/n matches lost by India= (Number of d/n matches lost by India)/ (Total number of d/n matches played by India)*100

= 40.61538%

Percentage of d/n matches tied by India= (Number of d/n matches tied by India)/ (Total number of d/n matches played by India)*100

= 1.230769%



3. Team's performance in day matches :-

Total number of day matches played by India= 220.

Number of day matches won by India= 134.

Number of day matches lost by India= 84.

Number of day matches tied by India= 2.

Percentage of day matches won by India= (Number of day matches won by India)/ (Total number of day matches played by India)*100

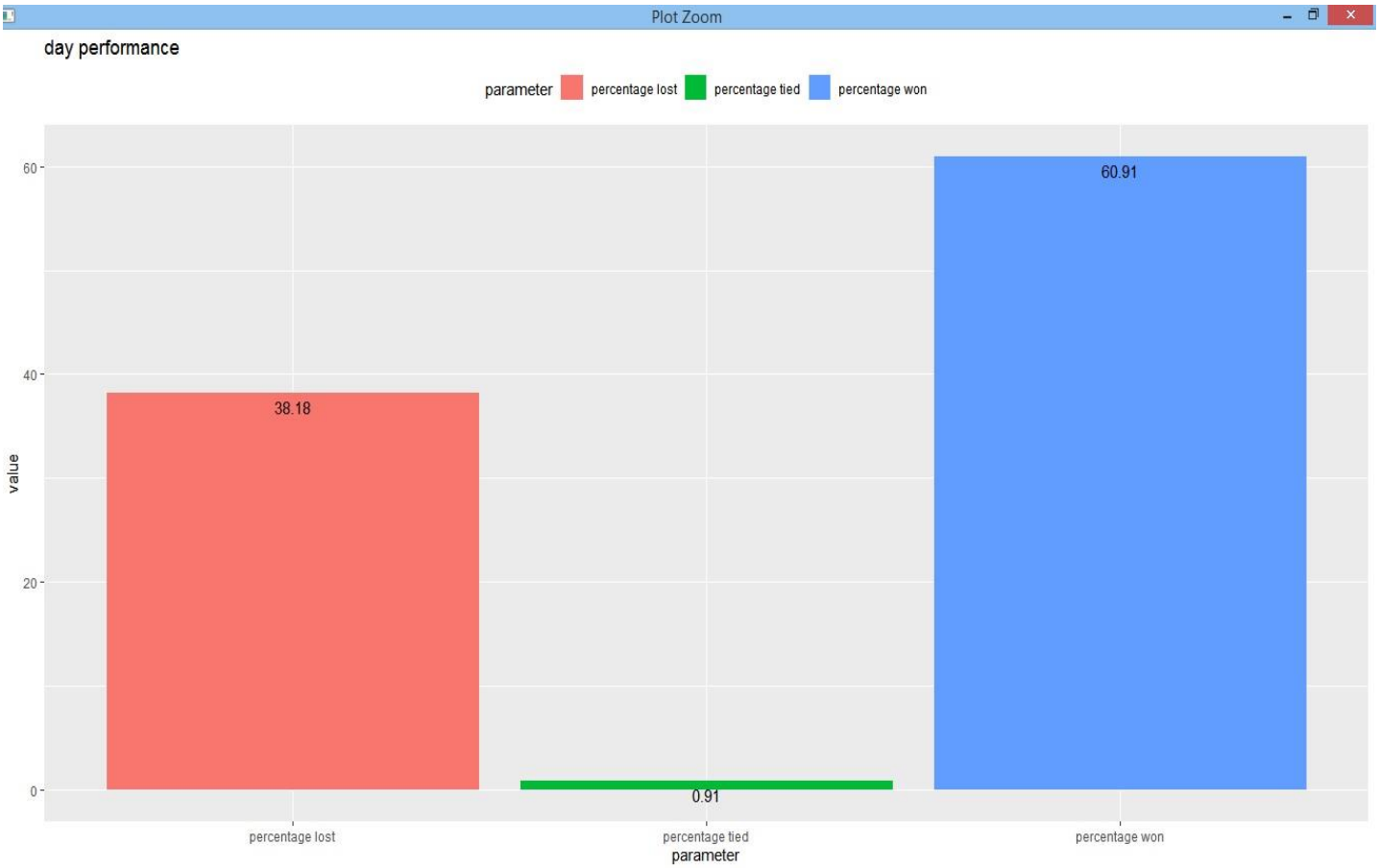
= 60.90909 %

Percentage of day matches lost by India= (Number of day matches lost by India)/ (Total number of day matches played by India)*100

= 38.18182 %

Percentage of day matches tied by India= (Number of day matches tied by India)/ (Total number of day matches played by India)*100

= 0.9090909 %



4. Toss results for India in overall matches :-

Number of tosses won= 268.

Number of tosses lost= 277.

Percentage of tosses lost= 50.82569%.

Percentage of tosses won= 49.1741%.

5. Overall patter of team's decision after winning the toss :-

Number of tosses won= 268.

Decision to bat first= 140.

Decision to bowl first= 128.

Percentage of decision to bat first= 52.23881%.

Percentage of decision to bowl first= 47.76119%.

6. Overall pattern of team's decision after winning the toss depending on whether it's a day or day-night match :-

Number of tosses won in day matches= 115.

Number of tosses won in day-night matches= 153.

Number of tosses won in day matches & India decided to bat 1st= 42.

Number of tosses won in day matches & India decided to bat 2nd = 73.

Number of tosses won in day-night matches & India decided to bat 1st = 98.

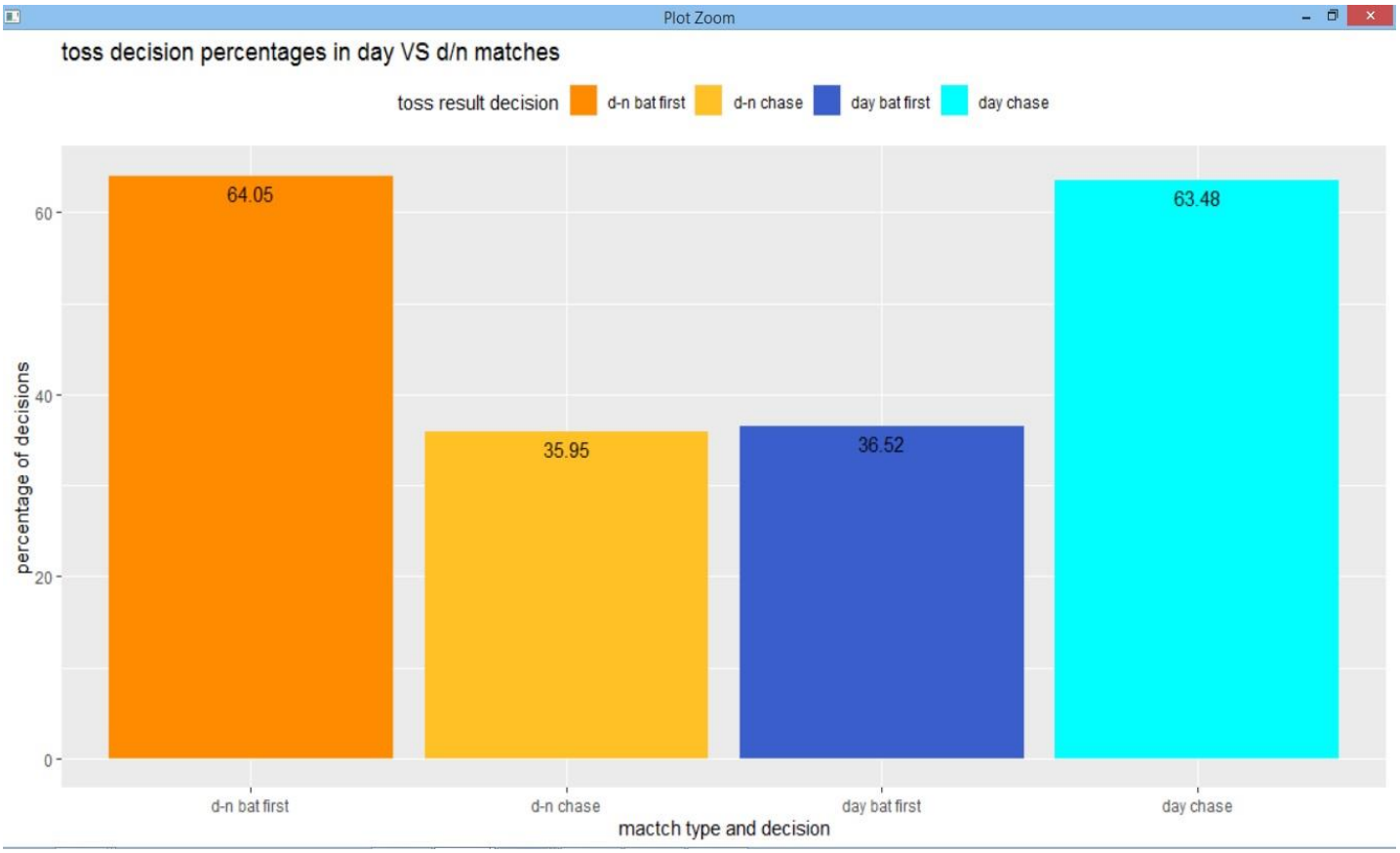
Number of tosses won in day-night matches & India decided to bat 1st = 55.

Percentage of tosses won in day matches & India decided to bat 1st =36.52174%.

Percentage of tosses won in day matches & India decided to bat 2nd = 63.47826 %.

Percentage of tosses won in day-night matches & India decided to bat 1st = 64.05229 %.

Percentage of tosses won in day-night matches & India decided to bat 2nd = 35.94771 %.



7. Overall patter of team's decision after winning the toss depending on whether the match is taking place in Asia or in SENA (South Africa, England, Australia, New Zealand) countries:-

Number of tosses won in SENA countries= 101.

Number of tosses won in Asian countries= 149.

Number of tosses won in SENA countries & India decided to bat 1st = 45.

Percentage of tosses won in SENA countries & India decided to bat 1st = 44.55446%.

Number of tosses won in SENA countries & India decided to bat 2nd = 56.

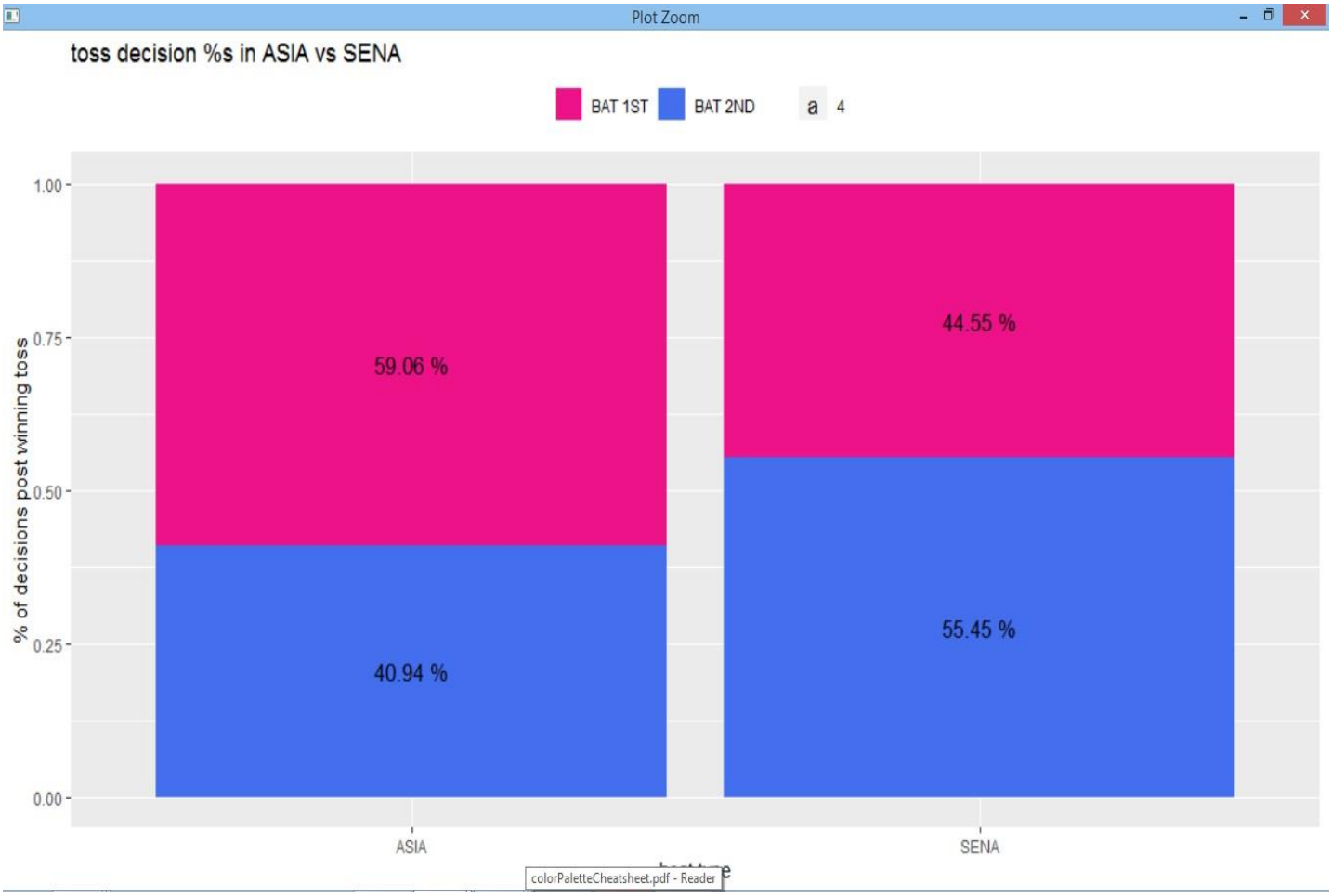
Percentage of tosses won in SENA countries & India decided to bat 2nd = 55.44554 %.

Number of tosses won in Asian countries & India decided to bat 1st = 88.

Percentage of tosses won in Asian countries & India decided to bat 1st = 59.0604 %.

Number of tosses won in Asian countries & India decided to bat 2nd = 61.

Percentage of tosses won in Asian countries & India decided to bat 2nd = 40.9396 %.



8. <u>Overall pattern of team's decision after winning the toss depending on the number of all-rounders Indian team is playing in the match :-</u>

Number of all-rounders India has played in ODI cricket since 1 January, 2000= 3, 2, 1 and 0.

Number of matches where India have played 3 all-rounders and won the toss= 5.

Number of matches where India have played 3 all-rounders & won the toss & decided to bat 1st = 4.

Number of matches where India have played 3 all-rounders & won the toss & decided to bat 2nd = 1.

Percentage of matches where India have played 3 all-rounders & won the toss & decided to bat 1st = 80%.

Percentage of matches where India have played 3 all-rounders & won the toss & decided to bat 2nd = 20%.

Number of matches where India have played 2 all-rounders and won the toss= 65.

Number of matches where India have played 2 all-rounders & won the toss & decided to bat 1st = 34.

Number of matches where India have played 2 all-rounders & won the toss & decided to bat 2nd = 31.

Percentage of matches where India have played 2 all-rounders & won the toss & decided to bat 1st = 52.30769%.

Percentage of matches where India have played 2 all-rounders & won the toss & decided to bat 2nd = 47.69231 %.

Number of matches where India have played 1 all-rounder and won the toss= 139.

Number of matches where India have played 1 all-rounder & won the toss & decided to bat 1st = 66.

Number of matches where India have played 1 all-rounder & won the toss & decided to bat 2nd = 73.

Percentage of matches where India have played 1 all-rounder & won the toss & decided to bat 1st = 47.48201%.

Percentage of matches where India have played 1 all-rounder & won the toss & decided to bat 2nd = 52.51799%.

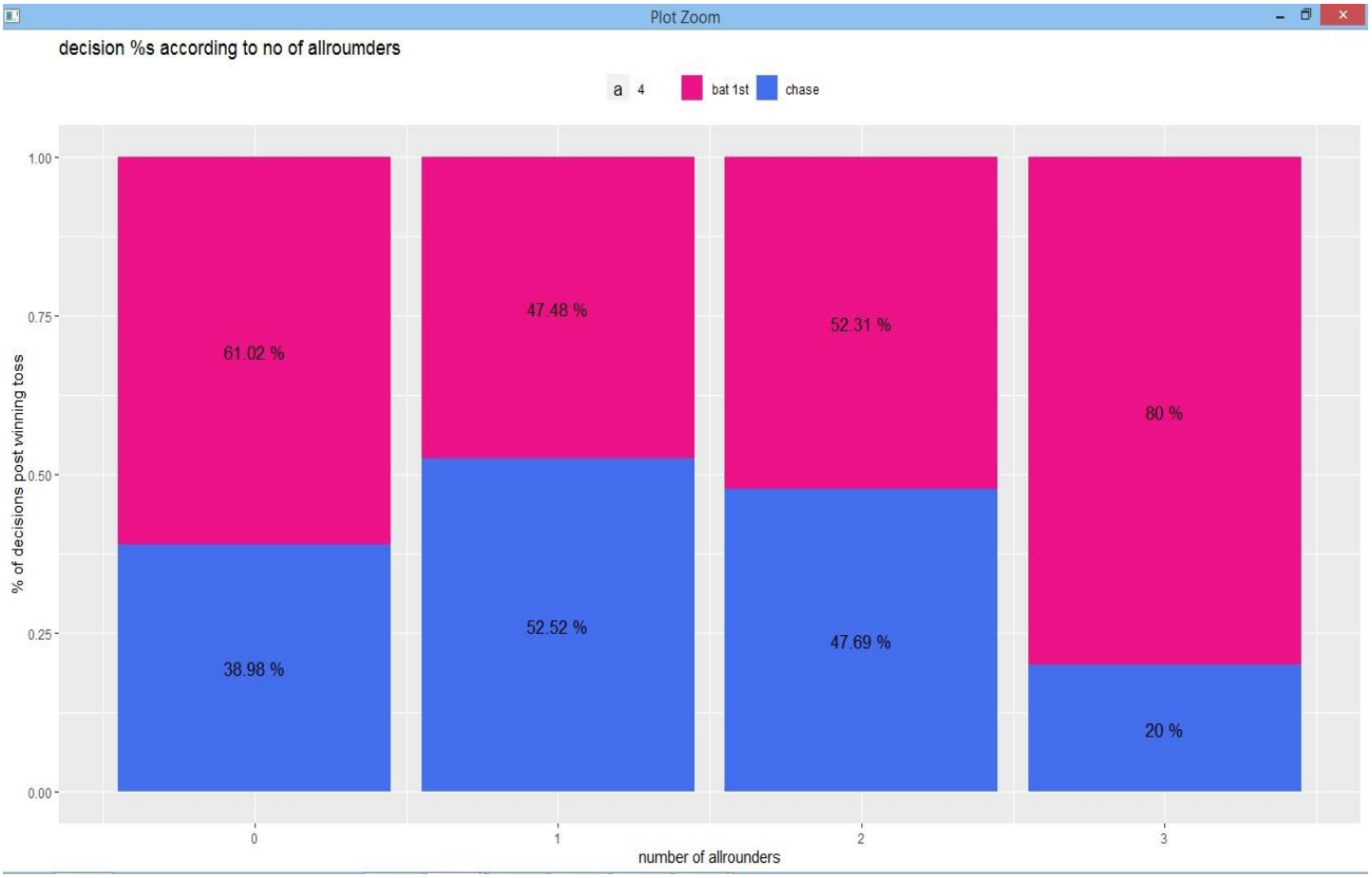
Number of matches where India have played 0 all-rounder and won the toss= 59.

Number of matches where India have played 0 all-rounder & won the toss & decided to bat 1st = 36.

Number of matches where India have played 0 all-rounder & won the toss & decided to bat 2nd = 23.

Percentage of matches where India have played 0 all-rounder & won the toss & decided to bat 1st = 61.01695 %.

Percentage of matches where India have played 0 all-rounder & won the toss & decided to bat 2nd = 38.98305 %.



9. Overall pattern of team's decision after winning the toss depending on the number of specialist bowlers Indian team is playing in the match:-

Number of bowlers India has played in ODI cricket since 1 January, 2000= 5, 4, 3 and 2.

Number of matches where India have played 5 bowlers and won the toss= 11.

Number of matches where India have played 5 bowlers & won the toss & decided to bat 1^{st} = 6.

Number of matches where India have played 5 bowlers & won the toss & decided to bat 2^{nd} = 5.

Percentage of matches where India have played 5 bowlers & won the toss & decided to bat 1^{st} = 54.54545%.

Percentage of matches where India have played 5 bowlers & won the toss & decided to bat 2^{nd} = 45.45455%.

Number of matches where India have played 4 bowlers and won the toss= 177.

Number of matches where India have played 4 bowlers & won the toss & decided to bat 1^{st} = 95.

Number of matches where India have played 4 bowlers & won the toss & decided to bat 2nd = 82.

Percentage of matches where India have played 4 bowlers & won the toss & decided to bat 1st = 53.67232 %.

Percentage of matches where India have played 4 bowlers & won the toss & decided to bat 2nd = 46.32768 %.

Number of matches where India have played 3 bowlers and won the toss= 73.

Number of matches where India have played 3 bowlers & won the toss & decided to bat 1st = 33.

Number of matches where India have played 3 bowlers & won the toss & decided to bat 2nd = 40.

Percentage of matches where India have played 3 bowlers & won the toss & decided to bat 1st = 45.20548 %.

Percentage of matches where India have played 3 bowlers & won the toss & decided to bat 2nd = 54.79452 %.

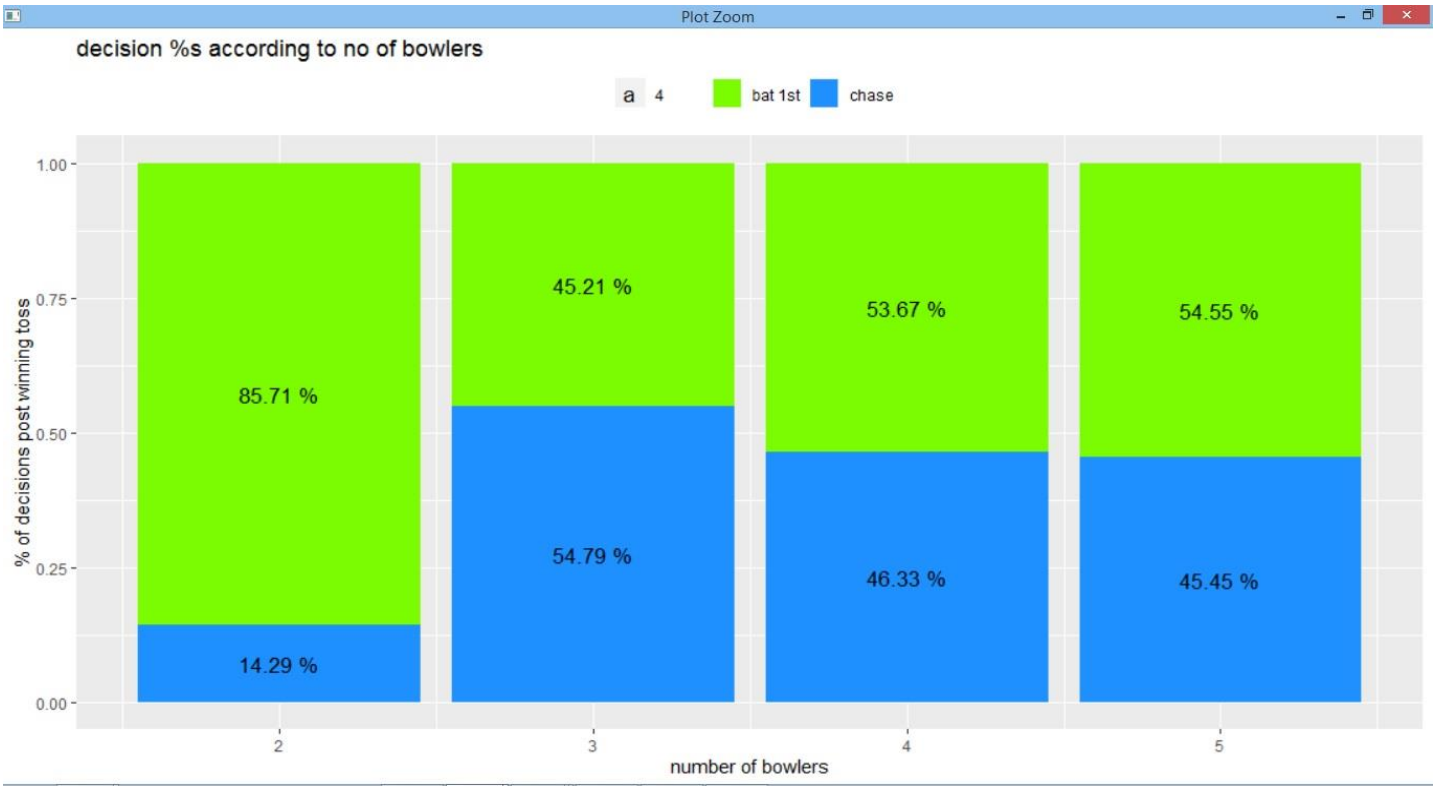
Number of matches where India have played 2 bowlers and won the toss= 7.

Number of matches where India have played 2 bowlers & won the toss & decided to bat 1st = 6.

Number of matches where India have played 2 bowlers & won the toss & decided to bat 2nd = 1.

Percentage of matches where India have played 2 bowlers & won the toss & decided to bat 1st = 85.71429 %.

Percentage of matches where India have played 2 bowlers & won the toss & decided to bat 2nd = 14.28571 %.



10. Overall pattern of team's decision after winning the toss depending on the number of specialist batsmen Indian team is playing in the match:-

Number of batsmen India has played in ODI cricket since 1 January, 2000= 7, 6, 5 and 4.

Number of matches where India have played 7 batsmen and won the toss= 60.

Number of matches where India have played 7 batsmen & won the toss & decided to bat 1^{st} = 35.

Number of matches where India have played 7 batsmen & won the toss & decided to bat 2^{nd} = 25.

Percentage of matches where India have played 7 batsmen & won the toss & decided to bat 1^{st} = 58.33333 %.

Percentage of matches where India have played 7 batsmen & won the toss & decided to bat 2^{nd} = 41.66667 %.

Number of matches where India have played 6 batsmen and won the toss= 176.

Number of matches where India have played 6 batsmen & won the toss & decided to bat 1^{st} = 83.

Number of matches where India have played 6 batsmen & won the toss & decided to bat 2^{nd} = 93.

Percentage of matches where India have played 6 batsmen & won the toss & decided to bat 1^{st} = 47.15909 %.

Percentage of matches where India have played 6 batsmen & won the toss & decided to bat 2^{nd} = 52.84091 %.

Number of matches where India have played 5 batsmen and won the toss= 27.

Number of matches where India have played 5 batsmen & won the toss & decided to bat 1^{st} = 19.

Number of matches where India have played 5 batsmen & won the toss & decided to bat 2^{nd} = 8.

Percentage of matches where India have played 5 batsmen & won the toss & decided to bat 1^{st} = 70.37037 %.

Percentage of matches where India have played 5 batsmen & won the toss & decided to bat 2^{nd} = 29.62963 %.

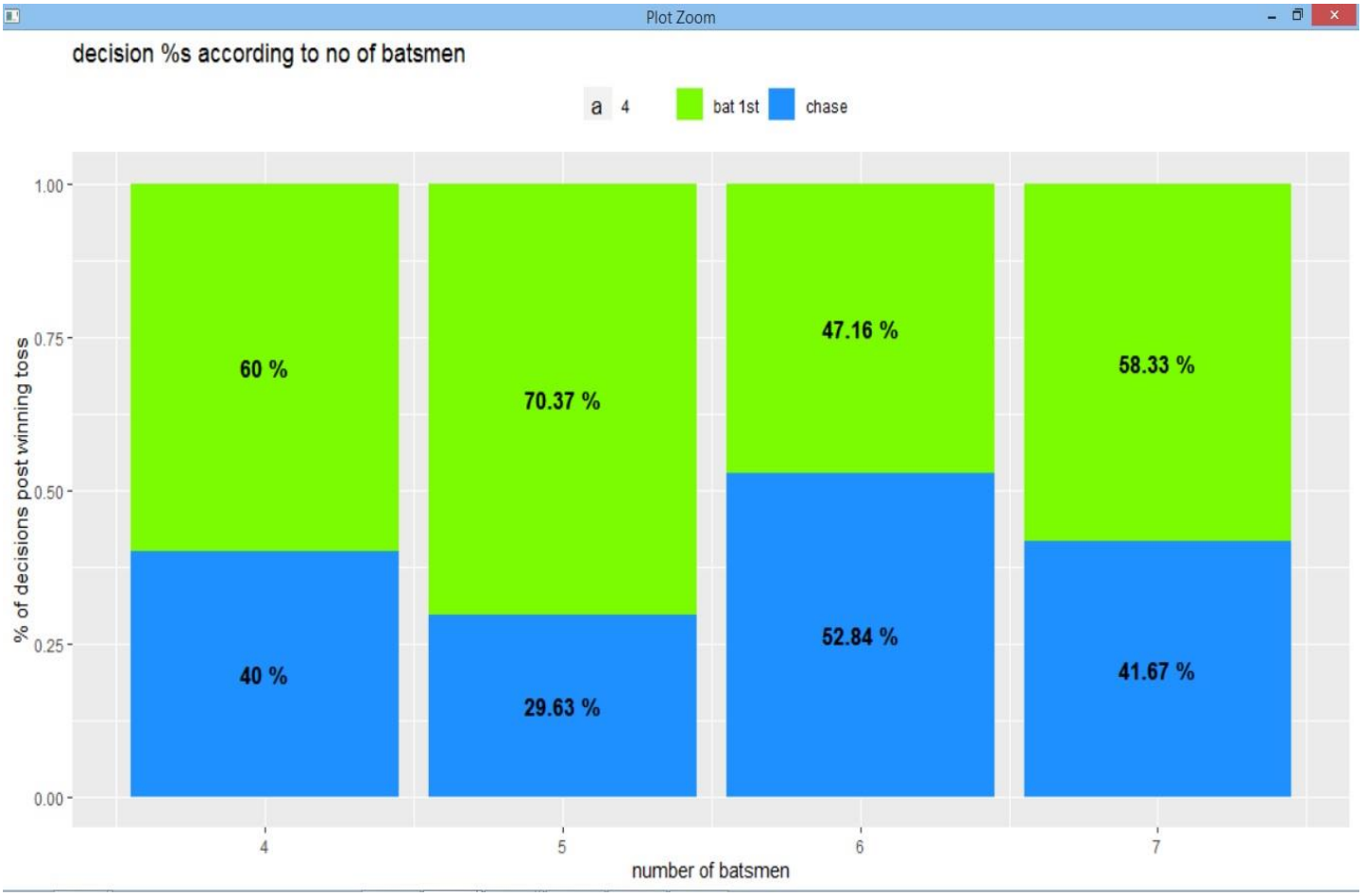
Number of matches where India have played 4 batsmen and won the toss= 5.

Number of matches where India have played 4 batsmen & won the toss & decided to bat 1^{st} = 3.

Number of matches where India have played 4 batsmen & won the toss & decided to bat 2^{nd} = 2.

Percentage of matches where India have played 4 batsmen & won the toss & decided to bat 1^{st} = 60 %.

Percentage of matches where India have played 4 batsmen & won the toss & decided to bat 2^{nd} = 40 %.



11. <u>How does the number of specialist bowlers fielded by Indian team affect the outcome of the match for India?</u>

Number of bowlers India has played in ODI cricket since 1 January, 2000= 5, 4, 3 and 2.

Number of matches where India have played 5 bowlers = 15.

Number of matches where India have played 5 bowlers & won match = 8.

Number of matches where India have played 5 bowlers & lost the match = 7.

Number of matches where India have played 5 bowlers & tied the match = 0.

Percentage of matches where India have played 5 bowlers & won the match = 53.33333 %.

Percentage of matches where India have played 5 bowlers & lost the match = 46.66667 %.

Percentage of matches where India have played 5 bowlers & tied the match = 0 %.

Number of matches where India have played 4 bowlers = 353.

Number of matches where India have played 4 bowlers & won match = 205.

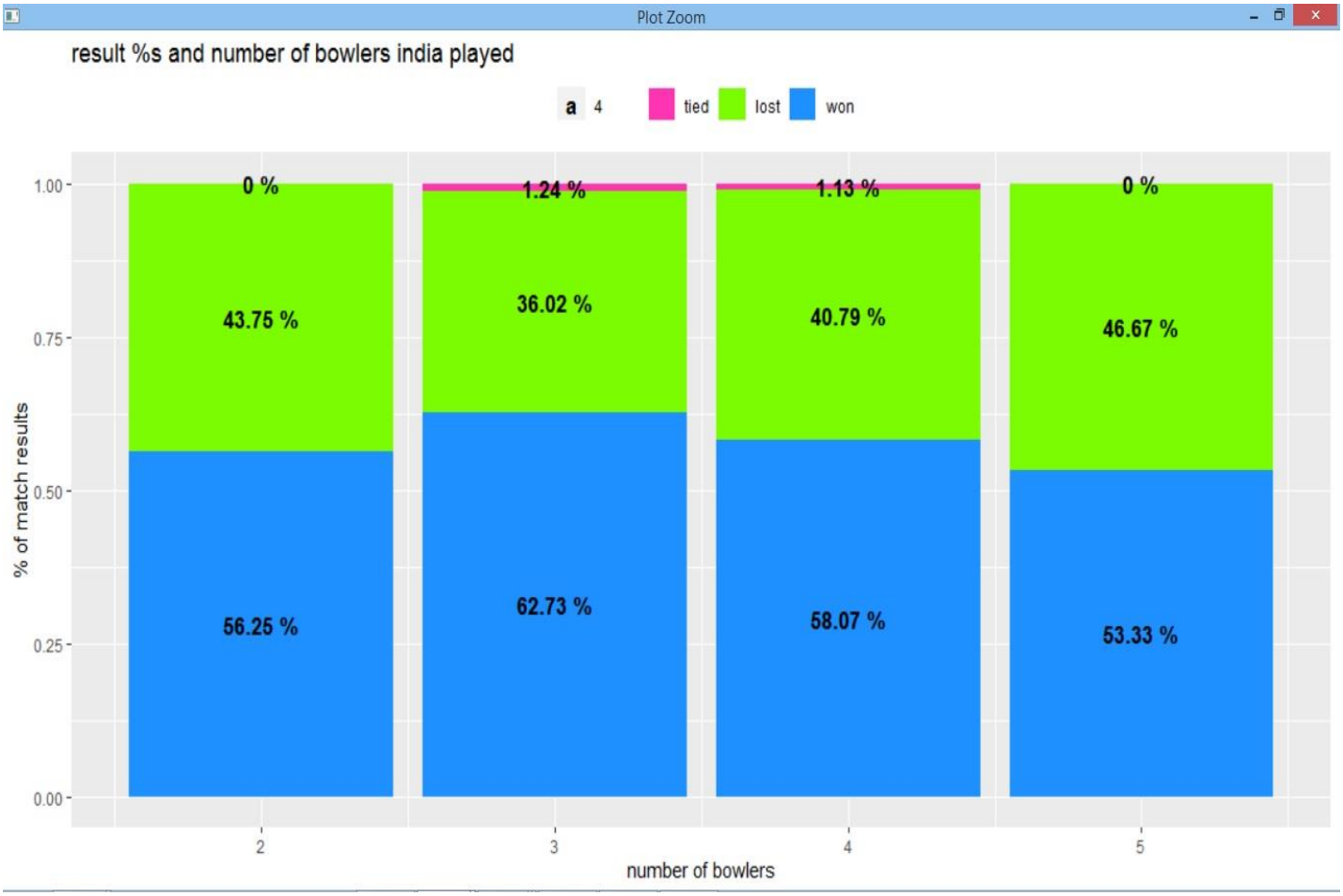
Number of matches where India have played 4 bowlers & lost the match = 144.

Number of matches where India have played 4 bowlers & tied the match = 4.

Percentage of matches where India have played 4 bowlers & won the match = 58.07365 %.
Percentage of matches where India have played 4 bowlers & lost the match = 40.7932 %.
Percentage of matches where India have played 4 bowlers & tied the match = 1.133144%.
Number of matches where India have played 3 bowlers = 161.
Number of matches where India have played 3 bowlers & won match = 101.
Number of matches where India have played 3 bowlers & lost the match = 58.
Number of matches where India have played 3 bowlers & tied the match = 2.

Percentage of matches where India have played 3 bowlers & won the match = 62.73292 %.
Percentage of matches where India have played 3 bowlers & lost the match = 36.02484 %.
Percentage of matches where India have played 3 bowlers & tied the match = 1.242236 %.
Number of matches where India have played 2 bowlers = 16.
Number of matches where India have played 2 bowlers & won match = 9.
Number of matches where India have played 2 bowlers & lost the match = 7.
Number of matches where India have played 2 bowlers & tied the match = 0.

Percentage of matches where India have played 2 bowlers & won the match = 56.25 %.
Percentage of matches where India have played 2 bowlers & lost the match = 43.75 %.
Percentage of matches where India have played 2 bowlers & tied the match = 0 %.



12. <u>How does the number of specialist batsmen fielded by Indian team affect the outcome of the match for India?</u>

Number of batsmen India has played in ODI cricket since 1 January, 2000= 7, 6, 5 and 4.

Number of matches where India have played 7 batsmen = 117.

Number of matches where India have played 7 batsmen & won match = 72.

Number of matches where India have played 7 batsmen & lost the match = 45.

Number of matches where India have played 7 batsmen & tied the match = 0.

Percentage of matches where India have played 7 batsmen & won the match = 61.53846 %.

Percentage of matches where India have played 7 batsmen & lost the match = 38.46154 %.

Percentage of matches where India have played 7 batsmen & tied the match = 0 %.

Number of matches where India have played 6 batsmen = 362.

Number of matches where India have played 6 batsmen & won match = 220.

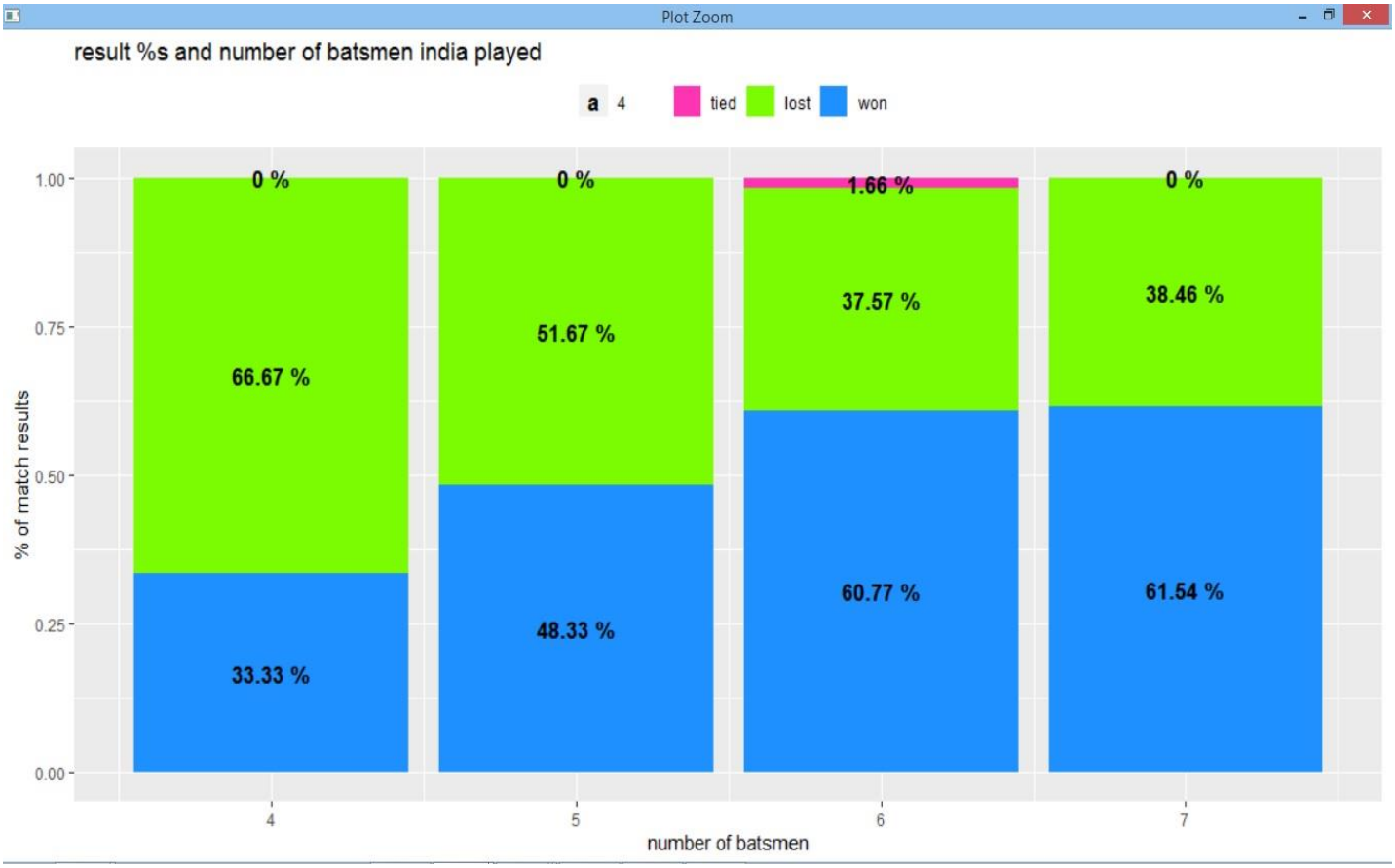
Number of matches where India have played 6 batsmen & lost the match = 136.

Number of matches where India have played 6 batsmen & tied the match = 6.

Percentage of matches where India have played 6 batsmen & won the match = 60.77348 %.
Percentage of matches where India have played 6 batsmen & lost the match = 37.56906 %.
Percentage of matches where India have played 6 batsmen & tied the match = 1.657459%.
Number of matches where India have played 5 batsmen = 60.
Number of matches where India have played 5 batsmen & won match = 29.
Number of matches where India have played 5 batsmen & lost the match = 31.
Number of matches where India have played 5 batsmen & tied the match = 0.

Percentage of matches where India have played 5 batsmen & won the match = 48.33333 %.
Percentage of matches where India have played 5 batsmen & lost the match = 51.66667 %.
Percentage of matches where India have played 5 batsmen & tied the match = 0 %.
Number of matches where India have played 4 batsmen = 6.
Number of matches where India have played 4 batsmen & won match = 2.
Number of matches where India have played 4 batsmen & lost the match = 4.
Number of matches where India have played 4 batsmen & tied the match = 0.

Percentage of matches where India have played 4 batsmen & won the match = 33.33333 %.
Percentage of matches where India have played 4 batsmen & lost the match = 66.66667 %.
Percentage of matches where India have played 4 batsmen & tied the match = 0 %.



13. <u>How does the number of specialist bowlers fielded by Indian team affect the outcome of the match in Asian countries?</u>

Number of bowlers India has played in ODI cricket in Asia since 1 January, 2000= 5, 4, 3 and 2.

Number of matches where India have played 5 bowlers in Asia = 10.

Number of matches where India have played 5 bowlers in Asia & won match = 5.

Number of matches where India have played 5 bowlers in Asia & lost the match = 75

Number of matches where India have played 5 bowlers in Asia & tied the match = 0.

Percentage of matches where India have played 5 bowlers in Asia & won the match = 50 %.

Percentage of matches where India have played 5 bowlers in Asia & lost the match = 50 %.

Percentage of matches where India have played 5 bowlers in Asia & tied the match = 0 %.

Number of matches where India have played 4 bowlers in Asia = 183.

Number of matches where India have played 4 bowlers in Asia & won match = 112.

Number of matches where India have played 4 bowlers in Asia & lost the match = 68.

Number of matches where India have played 4 bowlers in Asia & tied the match = 3.

Percentage of matches where India have played 4 bowlers in Asia & won the match = 61.20219 %.

Percentage of matches where India have played 4 bowlers in Asia & lost the match = 37.15847 %.

Percentage of matches where India have played 4 bowlers in Asia & tied the match = 1.639344 %.

Number of matches where India have played 3 bowlers in Asia = 110.

Number of matches where India have played 3 bowlers in Asia & won match = 71.

Number of matches where India have played 3 bowlers in Asia & lost the match = 39.

Number of matches where India have played 3 bowlers in Asia & tied the match = 0.

Percentage of matches where India have played 3 bowlers in Asia & won the match = 64.54545 %.

Percentage of matches where India have played 3 bowlers in Asia & lost the match = 35.45455 %.

Percentage of matches where India have played 3 bowlers in Asia & tied the match = 0 %.

Number of matches where India have played 2 bowlers in Asia = 12.

Number of matches where India have played 2 bowlers in Asia & won match = 9.

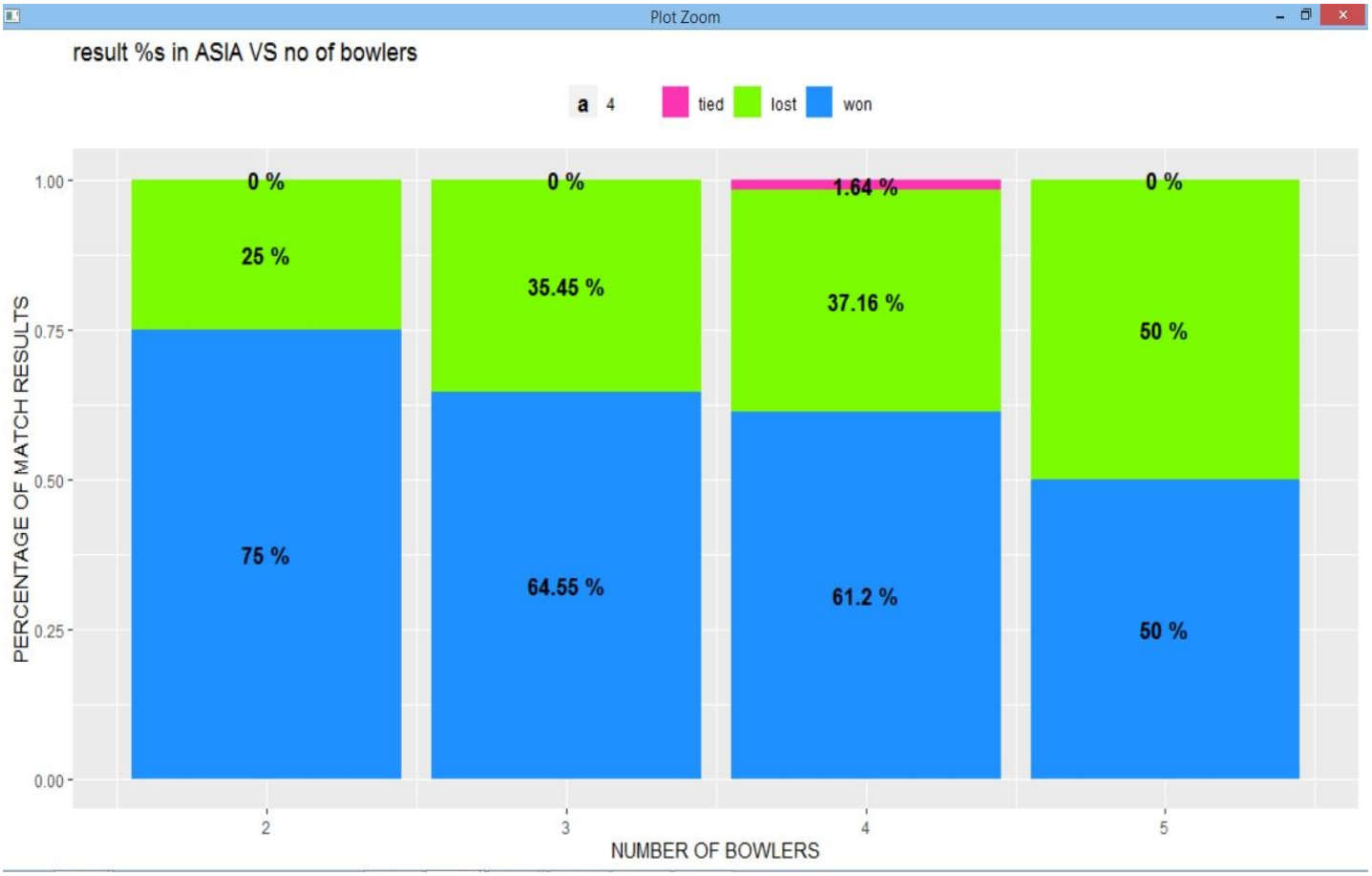
Number of matches where India have played 2 bowlers in Asia & lost the match = 3.

Number of matches where India have played 2 bowlers in Asia & tied the match = 0.

Percentage of matches where India have played 2 bowlers in Asia & won the match = 75 %.

Percentage of matches where India have played 2 bowlers in Asia & lost the match = 25 %.

Percentage of matches where India have played 2 bowlers in Asia & tied the match = 0 %.



14. <u>How does the number of specialist bowlers fielded by Indian team affect the outcome of the match in SENA countries?</u>

Number of bowlers India has played in ODI cricket in SENA since 1 January, 2000= 5, 4, 3 and 2.

Number of matches where India have played 5 bowlers in SENA = 5.

Number of matches where India have played 5 bowlers in SENA & won match = 3.

Number of matches where India have played 5 bowlers in SENA & lost the match = 2

Number of matches where India have played 5 bowlers in SENA & tied the match = 0.

Percentage of matches where India have played 5 bowlers in SENA & won the match = 60 %.

Percentage of matches where India have played 5 bowlers in SENA & lost the match = 40 %.

Percentage of matches where India have played 5 bowlers in SENA & tied the match = 0 %.

Number of matches where India have played 4 bowlers in SENA = 146.

Number of matches where India have played 4 bowlers in SENA & won match = 80.

Number of matches where India have played 4 bowlers in SENA & lost the match = 65.

Number of matches where India have played 4 bowlers in SENA & tied the match = 1.

Percentage of matches where India have played 4 bowlers in SENA & won the match = 54.79452 %.

Percentage of matches where India have played 4 bowlers in SENA & lost the match = 44.52055 %.

Percentage of matches where India have played 4 bowlers in SENA & tied the match = 0.6849315 %.

Number of matches where India have played 3 bowlers in SENA = 45.

Number of matches where India have played 3 bowlers in SENA & won match = 26.

Number of matches where India have played 3 bowlers in SENA & lost the match = 17.

Number of matches where India have played 3 bowlers in SENA & tied the match = 2.

Percentage of matches where India have played 3 bowlers in SENA & won the match = 57.77778 %.

Percentage of matches where India have played 3 bowlers in SENA & lost the match = 37.77778 %.

Percentage of matches where India have played 3 bowlers in SENA & tied the match = 4.444444%.

Number of matches where India have played 2 bowlers in SENA = 4.

Number of matches where India have played 2 bowlers in SENA & won match = 0.

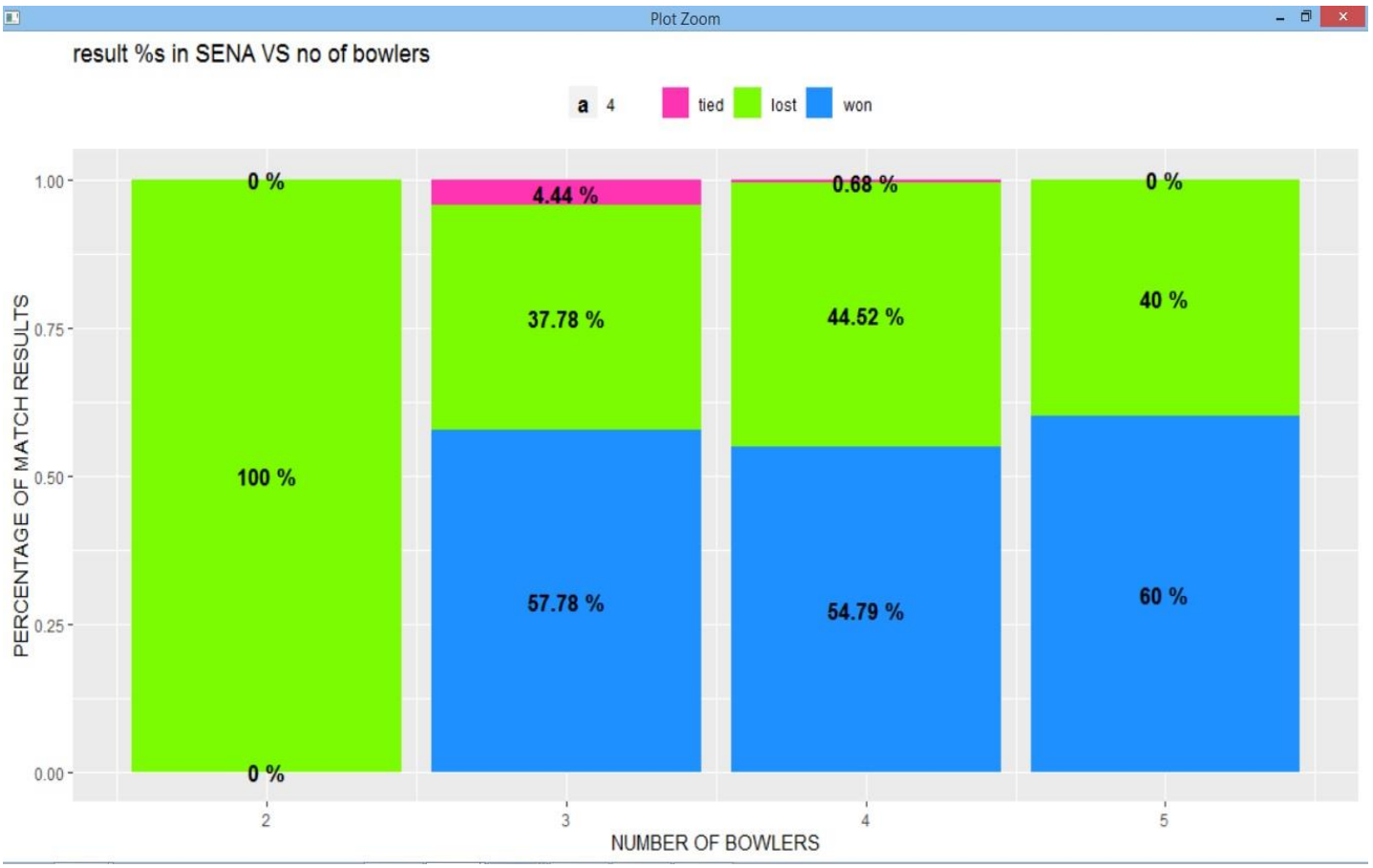
Number of matches where India have played 2 bowlers in SENA & lost the match = 4.

Number of matches where India have played 2 bowlers in SENA & tied the match = 0.

Percentage of matches where India have played 2 bowlers in SENA & won the match = 0 %.

Percentage of matches where India have played 2 bowlers in SENA & lost the match = 100 %.

Percentage of matches where India have played 2 bowlers in SENA & tied the match = 0 %.



15. <u>How does the number of specialist batsmen fielded by Indian team affect the outcome of the match in Asian countries?</u>

Number of batsmen India has played in ODI cricket in Asia since 1 January, 4000= 7, 6, 5 and 4.

Number of matches where India have played 7 batsmen in Asia = 66.

Number of matches where India have played 7 batsmen in Asia & won match = 41.

Number of matches where India have played 7 batsmen in Asia & lost the match = 25.

Number of matches where India have played 7 batsmen in Asia & tied the match = 0.

Percentage of matches where India have played 7 batsmen in Asia & won the match = 62.12121%.

Percentage of matches where India have played 7 batsmen in Asia & lost the match = 37.87879%.

Percentage of matches where India have played 7 batsmen in Asia & tied the match = 0 %.

Number of matches where India have played 6 batsmen in Asia = 214.

Number of matches where India have played 6 batsmen in Asia & won match = 138.

Number of matches where India have played 6 batsmen in Asia & lost the match = 73.

Number of matches where India have played 6 batsmen in Asia & tied the match = 3.

Percentage of matches where India have played 6 batsmen in Asia & won the match = 64.48598 %.

Percentage of matches where India have played 6 batsmen in Asia & lost the match = 34.11215 %.

Percentage of matches where India have played 6 batsmen in Asia & tied the match = 1.401869 %.

Number of matches where India have played 5 batsmen in Asia = 33.

Number of matches where India have played 5 batsmen in Asia & won match = 17.

Number of matches where India have played 5 batsmen in Asia & lost the match = 16.

Number of matches where India have played 5 batsmen in Asia & tied the match = 0.

Percentage of matches where India have played 5 batsmen in Asia & won the match = 51.51515 %.

Percentage of matches where India have played 5 batsmen in Asia & lost the match = 48.48485 %.

Percentage of matches where India have played 5 batsmen in Asia & tied the match = 0 %.

Number of matches where India have played 4 batsmen in Asia = 2.

Number of matches where India have played 4 batsmen in Asia & won match = 1.

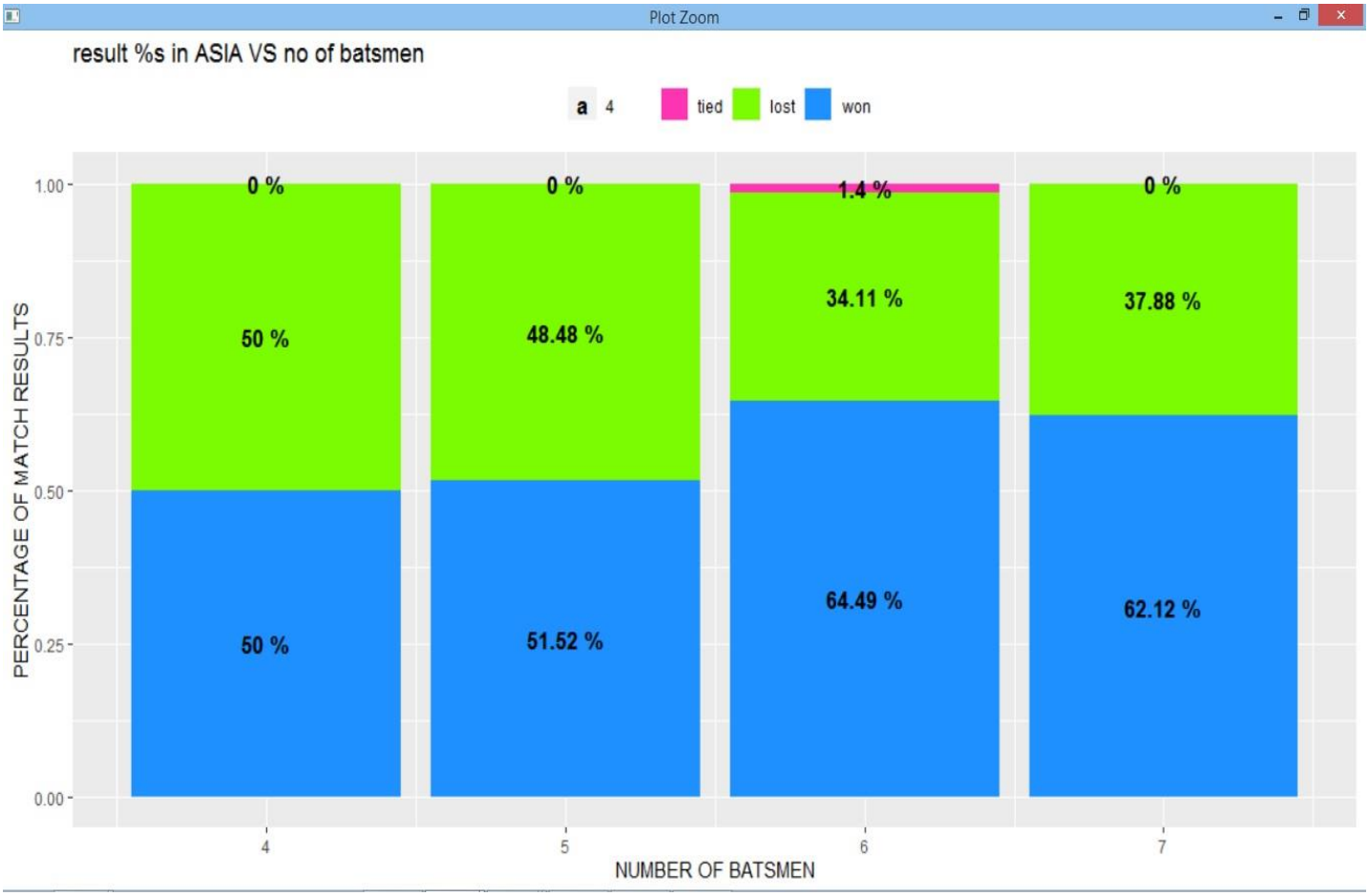
Number of matches where India have played 4 batsmen in Asia & lost the match = 1.

Number of matches where India have played 4 batsmen in Asia & tied the match = 0.

Percentage of matches where India have played 4 batsmen in Asia & won the match = 50 %.

Percentage of matches where India have played 4 batsmen in Asia & lost the match = 50 %.

Percentage of matches where India have played 4 batsmen in Asia & tied the match = 0 %.



16. <u>How does the number of specialist batsmen fielded by Indian team affect the outcome of the match in SENA countries?</u>

Number of batsmen India has played in ODI cricket in SENA since 1 January, 4000= 7, 6, 5 and 4.

Number of matches where India have played 7 batsmen in SENA = 44.

Number of matches where India have played 7 batsmen in SENA & won match = 28.

Number of matches where India have played 7 batsmen in SENA & lost the match = 16.

Number of matches where India have played 7 batsmen in SENA & tied the match = 0.

Percentage of matches where India have played 7 batsmen in SENA & won the match = 63.63636 %.

Percentage of matches where India have played 7 batsmen in SENA & lost the match = 36.36364 %.

Percentage of matches where India have played 7 batsmen in SENA & tied the match = 0 %.

Number of matches where India have played 6 batsmen in SENA = 126.

Number of matches where India have played 6 batsmen in SENA & won match = 69.

Number of matches where India have played 6 batsmen in SENA & lost the match = 54.

Number of matches where India have played 6 batsmen in SENA & tied the match = 3.

Percentage of matches where India have played 6 batsmen in SENA & won the match = 54.7619 %.

Percentage of matches where India have played 6 batsmen in SENA & lost the match = 42.85714 %.

Percentage of matches where India have played 6 batsmen in SENA & tied the match = 2.380952 %.

Number of matches where India have played 5 batsmen in SENA = 26.

Number of matches where India have played 5 batsmen in SENA & won match = 11.

Number of matches where India have played 5 batsmen in SENA & lost the match = 15.

Number of matches where India have played 5 batsmen in SENA & tied the match = 0.

Percentage of matches where India have played 5 batsmen in SENA & won the match = 42.30769 %.

Percentage of matches where India have played 5 batsmen in SENA & lost the match = 57.69231 %.

Percentage of matches where India have played 5 batsmen in SENA & tied the match = 0 %.

Number of matches where India have played 4 batsmen in SENA = 4.

Number of matches where India have played 4 batsmen in SENA & won match = 1.

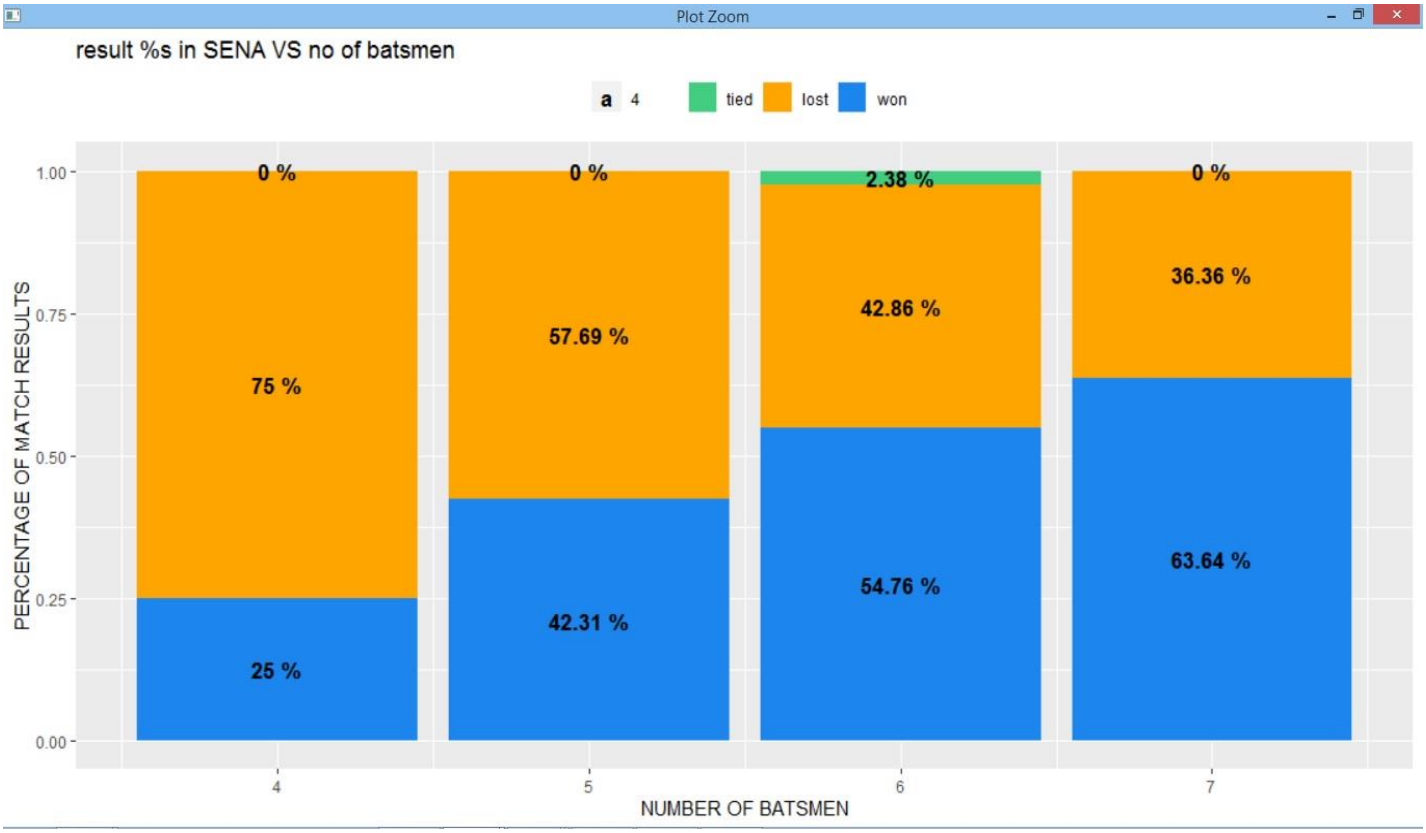
Number of matches where India have played 4 batsmen in SENA & lost the match = 3.

Number of matches where India have played 4 batsmen in SENA & tied the match = 0.

Percentage of matches where India have played 4 batsmen in SENA & won the match = 25 %.

Percentage of matches where India have played 4 batsmen in SENA & lost the match = 75 %.

Percentage of matches where India have played 4 batsmen in SENA & tied the match = 0 %.



17. How does the number of all-rounders fielded by Indian team affect the outcome of the match for India?

Number of all-rounders India has played in ODI cricket since 1 January, 0000= 3, 2, 1 and 0.

Number of matches where India have played 3 all-rounders = 12.

Number of matches where India have played 3 all-rounders & won match = 6.

Number of matches where India have played 3 all-rounders & lost the match = 6.

Number of matches where India have played 3 all-rounders & tied the match = 0.

Percentage of matches where India have played 3 all-rounders & won the match = 50 %.

Percentage of matches where India have played 3 all-rounders & lost the match = 50 %.

Percentage of matches where India have played 3 all-rounders & tied the match = 0 %.

Number of matches where India have played 2 all-rounders = 143.

Number of matches where India have played 2 all-rounders & won match = 89.

Number of matches where India have played 2 all-rounders & lost the match = 52.

Number of matches where India have played 2 all-rounders & tied the match = 2.

Percentage of matches where India have played 2 all-rounders & won the match = 62.23776 %.

Percentage of matches where India have played 2 all-rounders & lost the match = 36.36364 %.

Percentage of matches where India have played 2 all-rounders & tied the match = 1.398601 %.

Number of matches where India have played 1 all-rounders = 282.

Number of matches where India have played 1 all-rounders & won match = 163.

Number of matches where India have played 1 all-rounders & lost the match = 115.

Number of matches where India have played 1 all-rounders & tied the match = 4.

Percentage of matches where India have played 1 all-rounders & won the match = 57.80142 %.

Percentage of matches where India have played 1 all-rounders & lost the match = 40.78014 %.

Percentage of matches where India have played 1 all-rounders & tied the match = 1.41844%.

Number of matches where India have played 0 all-rounders = 108.

Number of matches where India have played 0 all-rounders & won match = 65.

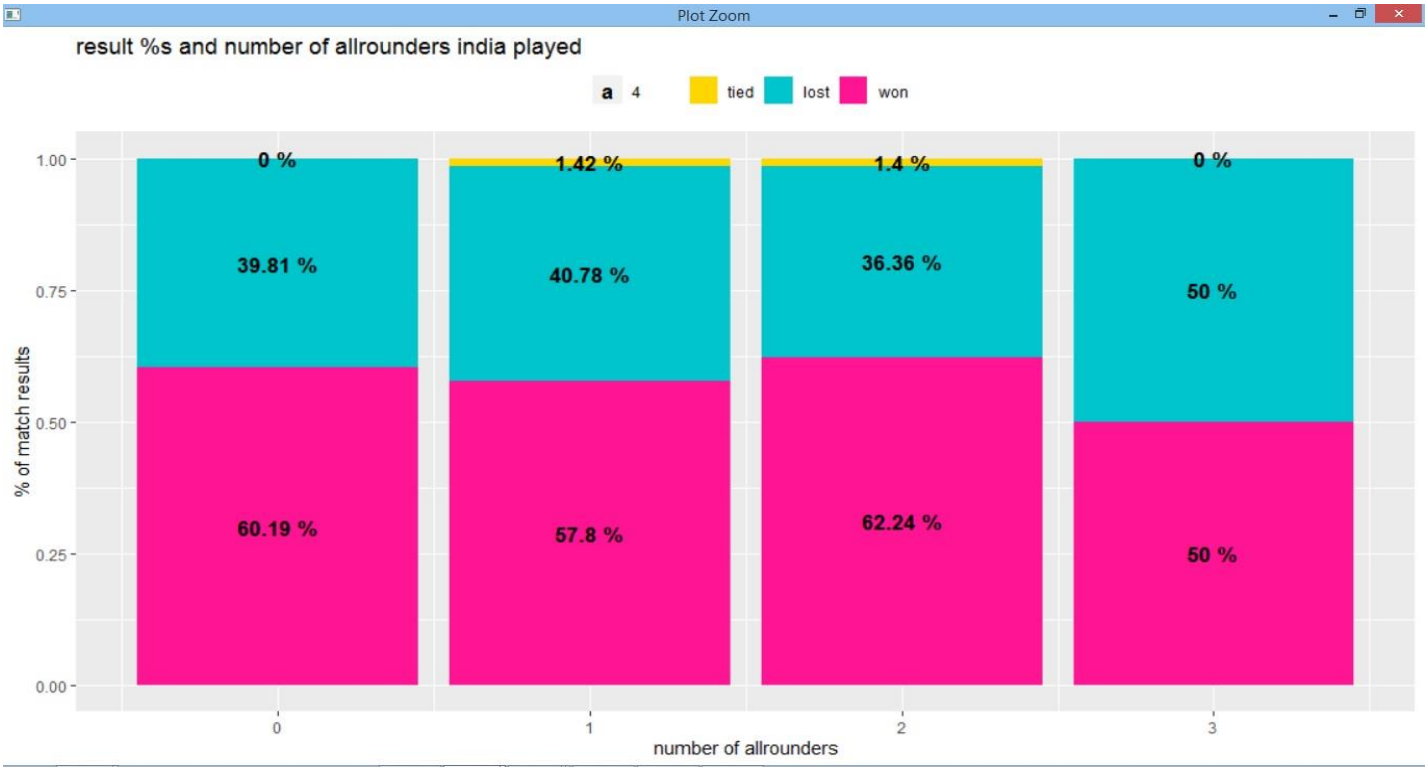
Number of matches where India have played 0 all-rounders & lost the match = 43.

Number of matches where India have played 0 all-rounders & tied the match = 0.

Percentage of matches where India have played 0 all-rounders & won the match = 60.18519%.

Percentage of matches where India have played 0 all-rounders & lost the match = 39.81481%.

Percentage of matches where India have played 0 all-rounders & tied the match = 0 %.



18. <u>How does the number of all-rounders fielded by Indian team affect the outcome of the match in Asian countries?</u>

Number of all-rounders India has played in ODI cricket in Asian since 1 January, 4000= 3, 2, 1 and 4.

Number of matches where India have played 3 all-rounders in Asian = 10.

Number of matches where India have played 3 all-rounders in Asian & won match = 6.

Number of matches where India have played 3 all-rounders in Asian & lost the match = 4.

Number of matches where India have played 3 all-rounders in Asian & tied the match = 0.

Percentage of matches where India have played 3 all-rounders in Asian & won the match = 60 %.

Percentage of matches where India have played 3 all-rounders in Asian & lost the match = 40 %.

Percentage of matches where India have played 3 all-rounders in Asian & tied the match = 0 %.

Number of matches where India have played 2 all-rounders in Asian = 80.

Number of matches where India have played 2 all-rounders in Asian & won match = 57.

Number of matches where India have played 2 all-rounders in Asian & lost the match = 23.

Number of matches where India have played 2 all-rounders in Asian & tied the match = 0.

Percentage of matches where India have played 2 all-rounders in Asian & won the match = 71.25 %.

Percentage of matches where India have played 2 all-rounders in Asian & lost the match = 28.75 %.

Percentage of matches where India have played 2 all-rounders in Asian & tied the match = 0 %.

Number of matches where India have played 1 all-rounders in Asian = 170.

Number of matches where India have played 1 all-rounders in Asian & won match = 101.

Number of matches where India have played 1 all-rounders in Asian & lost the match = 66.

Number of matches where India have played 1 all-rounders in Asian & tied the match = 3.

Percentage of matches where India have played 1 all-rounders in Asian & won the match = 59.41176 %.

Percentage of matches where India have played 1 all-rounders in Asian & lost the match = 38.82353 %.

Percentage of matches where India have played 1 all-rounders in Asian & tied the match = 1.764706%.

Number of matches where India have played 0 all-rounders in Asian = 55.

Number of matches where India have played 0 all-rounders in Asian & won match = 33.

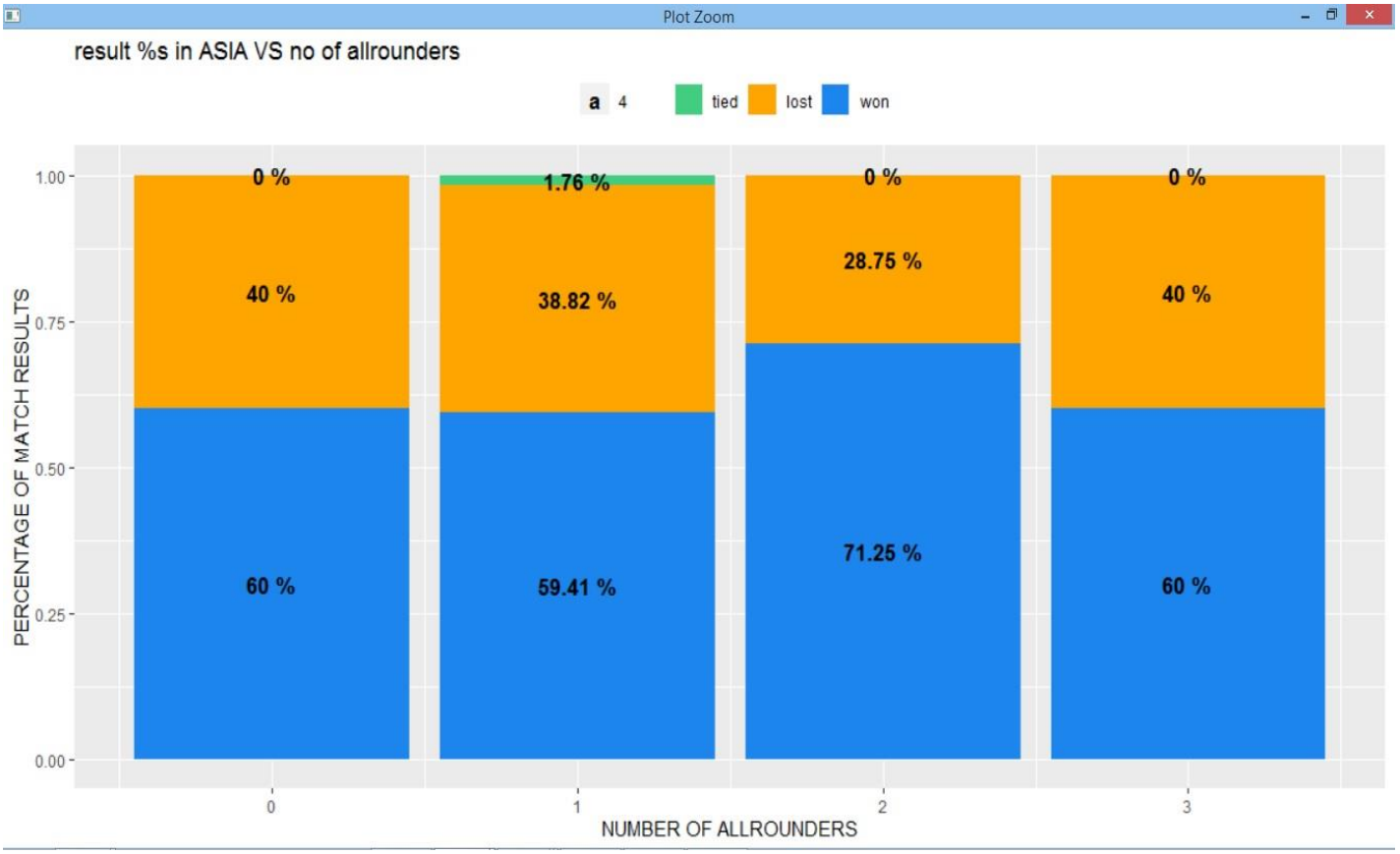
Number of matches where India have played 0 all-rounders in Asian & lost the match = 22.

Number of matches where India have played 0 all-rounders in Asian & tied the match = 0.

Percentage of matches where India have played 0 all-rounders in Asian & won the match = 60 %.

Percentage of matches where India have played 0 all-rounders in Asian & lost the match = 40 %.

Percentage of matches where India have played 0 all-rounders in Asian & tied the match = 0 %.



19. How does the number of all-rounders fielded by Indian team affect the outcome of the match in SENA countries?

Number of all-rounders India has played in ODI cricket in SENA since 1 January, 4000= 3, 2, 1 and 4.

Number of matches where India have played 3 all-rounders in SENA = 2.

Number of matches where India have played 3 all-rounders in SENA & won match = 0.

Number of matches where India have played 3 all-rounders in SENA & lost the match = 2.

Number of matches where India have played 3 all-rounders in SENA & tied the match = 0.

Percentage of matches where India have played 3 all-rounders in SENA & won the match = 0 %.

Percentage of matches where India have played 3 all-rounders in SENA & lost the match = 100 %.

Percentage of matches where India have played 3 all-rounders in SENA & tied the match = 0 %.

Number of matches where India have played 2 all-rounders in SENA = 56.

Number of matches where India have played 2 all-rounders in SENA & won match = 27.

Number of matches where India have played 2 all-rounders in SENA & lost the match = 27.

Number of matches where India have played 2 all-rounders in SENA & tied the match = 2.

Percentage of matches where India have played 2 all-rounders in SENA & won the match = 48.21429 %.

Percentage of matches where India have played 2 all-rounders in SENA & lost the match = 48.21429 %.

Percentage of matches where India have played 2 all-rounders in SENA & tied the match = 3.571429%.

Number of matches where India have played 1 all-rounders in SENA = 96.

Number of matches where India have played 1 all-rounders in SENA & won match = 53.

Number of matches where India have played 1 all-rounders in SENA & lost the match = 42.

Number of matches where India have played 1 all-rounders in SENA & tied the match = 1.

Percentage of matches where India have played 1 all-rounders in SENA & won the match = 55.20833 %.

Percentage of matches where India have played 1 all-rounders in SENA & lost the match = 43.75 %.

Percentage of matches where India have played 1 all-rounders in SENA & tied the match = 1.041667 %.

Number of matches where India have played 0 all-rounders in SENA = 46.

Number of matches where India have played 0 all-rounders in SENA & won match = 29.

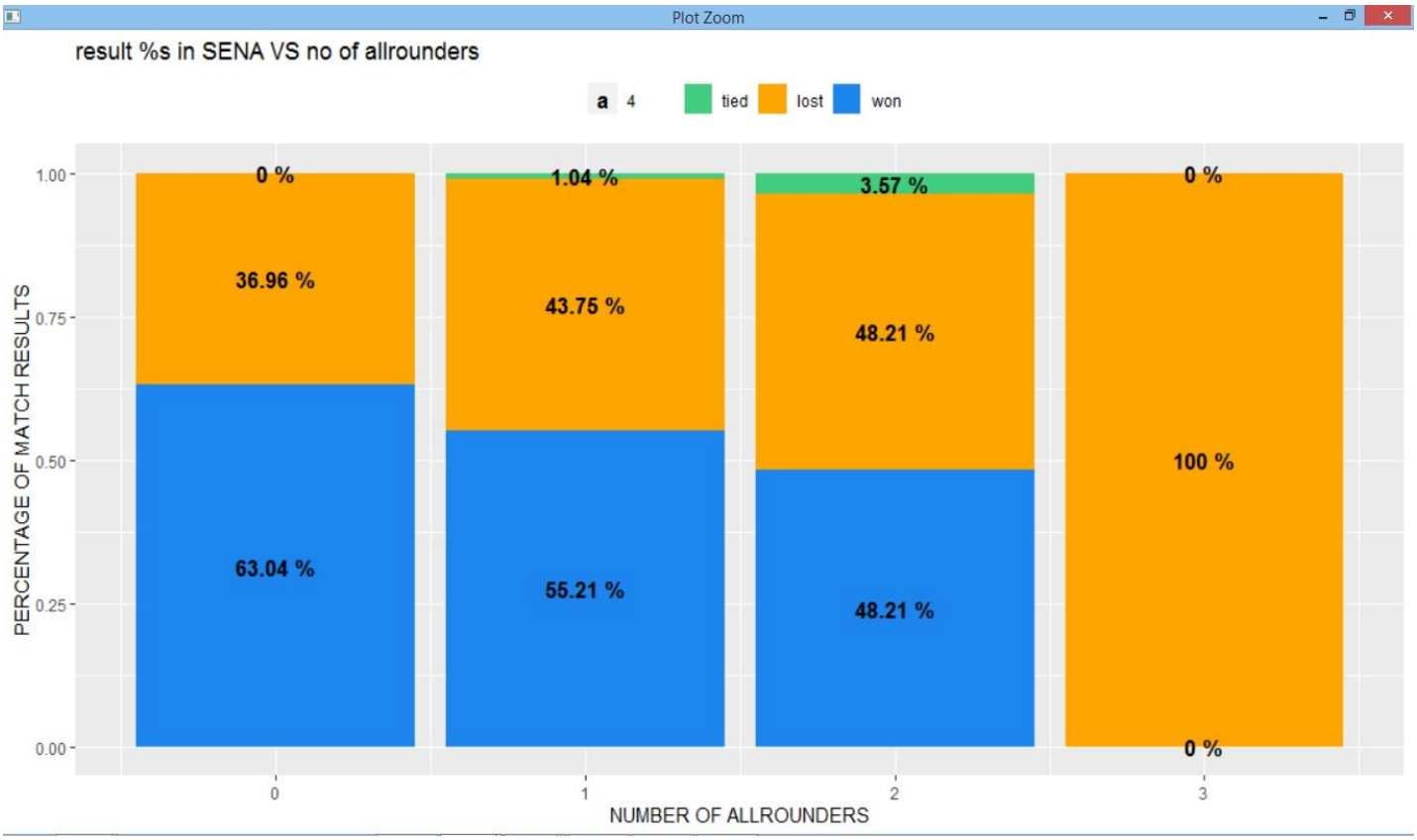
Number of matches where India have played 0 all-rounders in SENA & lost the match = 17.

Number of matches where India have played 0 all-rounders in SENA & tied the match = 0.

Percentage of matches where India have played 0 all-rounders in SENA & won the match = 63.04348%.

Percentage of matches where India have played 0 all-rounders in SENA & lost the match = 36.95652%.

Percentage of matches where India have played 0 all-rounders in SENA & tied the match = 0 %.



20. <u>How does the number of specialist bowlers fielded by Indian team affect the eventual runs scored and wickets lost by opposition team when they bat first?</u>

Number of specialist bowlers playing for India when the opposition batted 1st= 5, 4, 3 and 2.

Average wickets lost by opposition when India played 5 specialist bowlers= 7.857143.

Average wickets lost by opposition when India played 4 specialist bowlers= 7.751323.

Average wickets lost by opposition when India played 3 specialist bowlers= 7.849462.

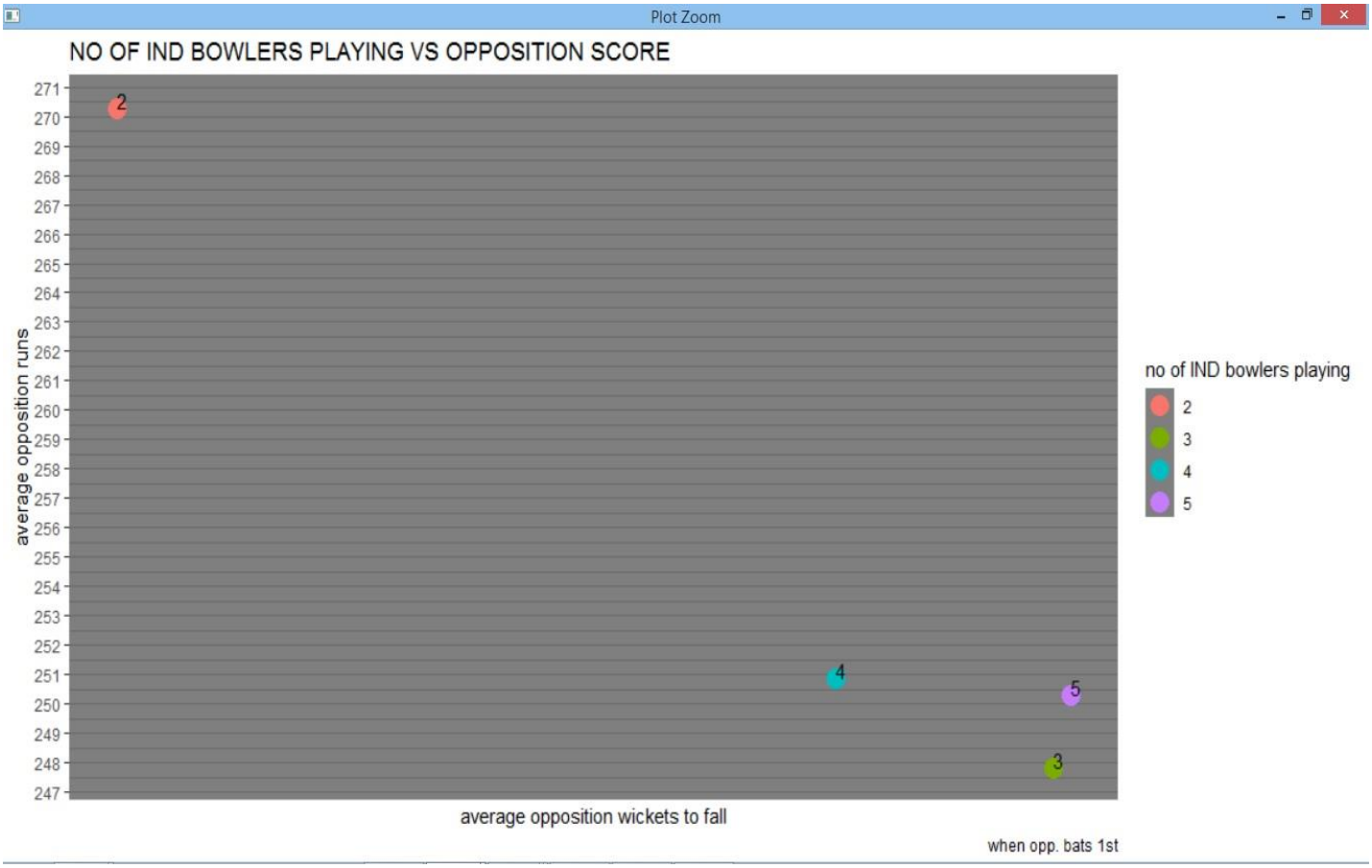
Average wickets lost by opposition when India played 2 specialist bowlers= 7.428571.

Average runs by opposition when India played 5 specialist bowlers= 250.2857.

Average runs by opposition when India played 4 specialist bowlers= 250.8677.

Average runs by opposition when India played 3 specialist bowlers= 247.828.

Average runs by opposition when India played 2 specialist bowlers= 270.2857.



21. <u>How does the number of specialist batsmen fielded by Indian team affect the eventual score and wickets lost by Indian team when they bat first?</u>

Number of specialist batsmen playing for India when they batted 1st= 7, 6, 5 and 4.

Average wickets lost by India when India played 7 specialist batsmen= 7.714286.

Average wickets lost by India when India played 6 specialist batsmen= 7.283019.

Average wickets lost by India when India played 5 specialist batsmen= 7.096774.

Average wickets lost by India when India played 4 specialist batsmen= 7.333333.

Average runs by India when India played 7 specialist batsmen= 255.7143.

Average runs by India when India played 6 specialist batsmen= 273.5723.

Average runs by India when India played 5 specialist batsmen= 267.0645.

Average runs by India when India played 4 specialist batsmen= 229.3333.

22. <u>How does the number of all-rounders fielded by India affect the score of the Indian team?</u>

Number of all-rounders playing for India when they batted 1st= 3, 2, 1 and 0.

Average wickets lost by India when India played 3 all-rounders= 6.714286.

Average wickets lost by India when India played 2 all-rounders= 7.029412.

Average wickets lost by India when India played 1 all-rounders= 7.344538.

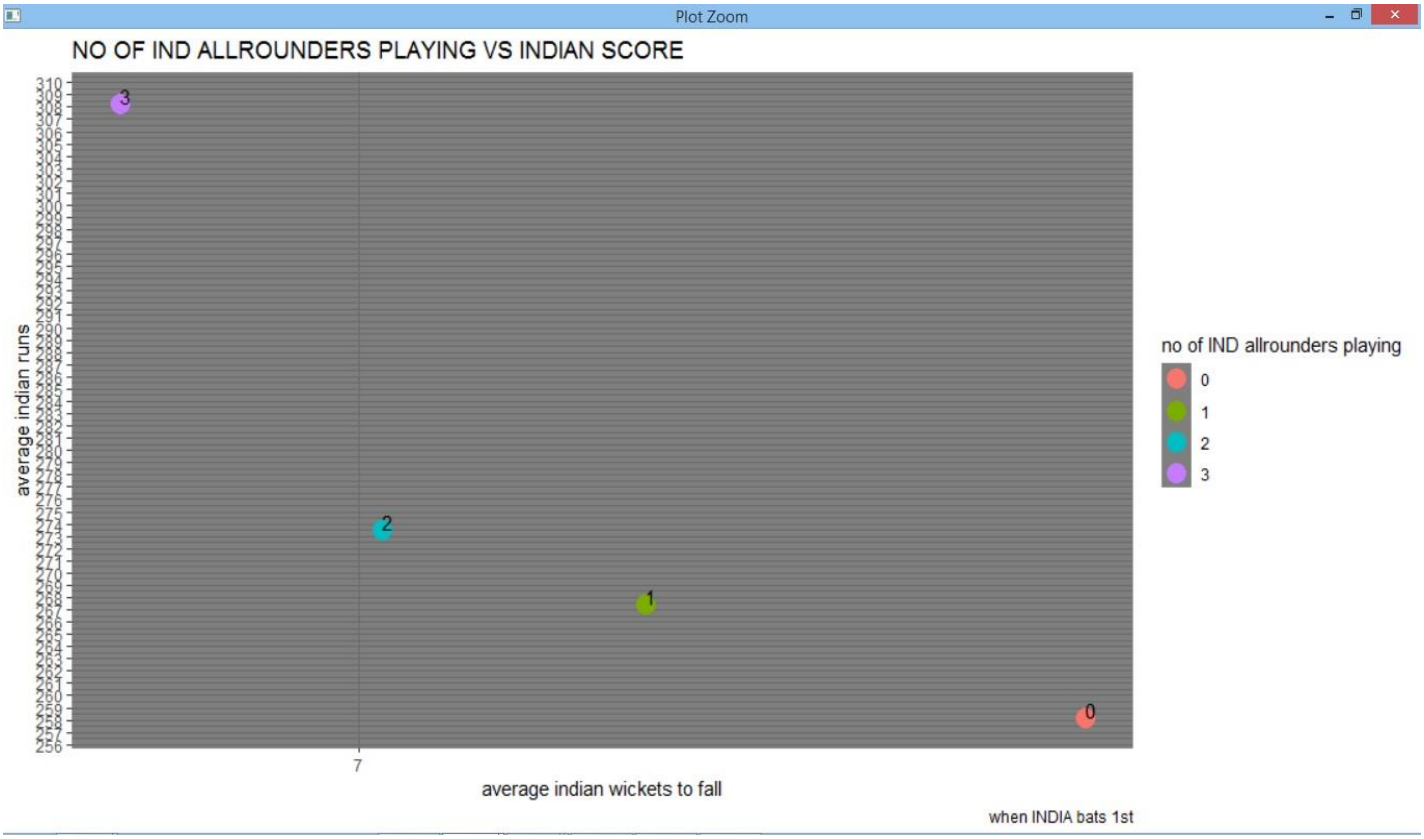
Average wickets lost by India when India played 0 all-rounders= 7.872727.

Average runs by India when India played 3 all-rounders= 308.2857.

Average runs by India when India played 2 all-rounders= 273.5.

Average runs by India when India played 1 all-rounders= 267.4706.

Average runs by India when India played 0 all-rounders= 258.1818.



23. <u>How does the number of all-rounders fielded by India affect the number of runs and wickets to fall for opposition team when they bat first?</u>

Number of all-rounders playing for India when opposition batted 1st= 3, 2, 1 and 0.

Average wickets lost by opposition when India played 3 all-rounders= 7.

Average wickets lost by opposition when India played 2 all-rounders= 7.613333.

Average wickets lost by opposition when India played 1 all-rounders= 8.03681.

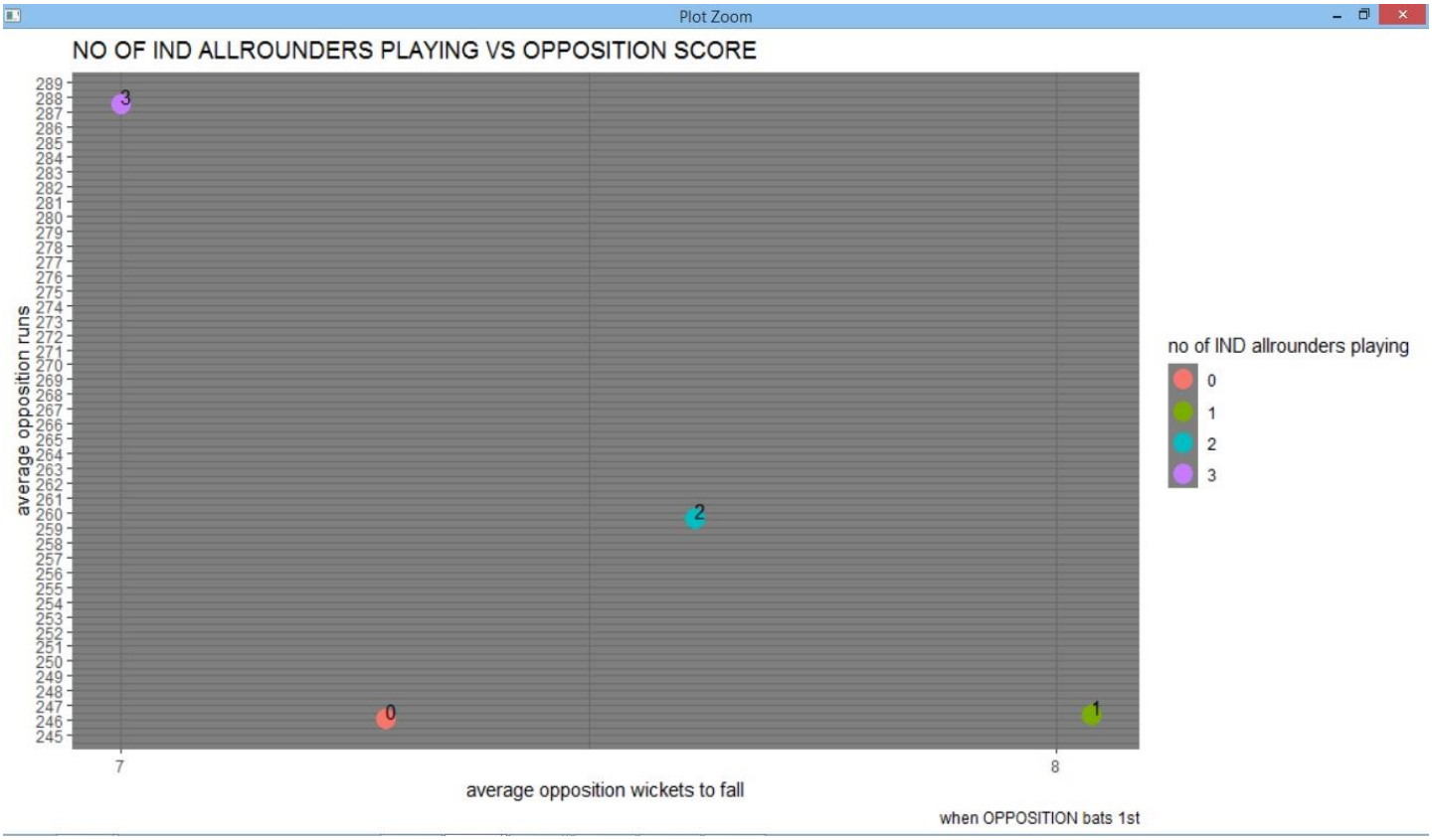
Average wickets lost by opposition when India played 0 all-rounders= 7.283019.

Average runs by opposition when India played 3 all-rounders= 287.6.

Average runs by opposition when India played 2 all-rounders= 259.5867.

Average runs by opposition when India played 1 all-rounders= 246.3497.

Average runs by opposition when India played 0 all-rounders= 246.1132.



24. <u>How does the number of specialist batsmen fielded by India affect the outcome of the match for India when they are chasing?</u>

Number of specialist batsmen playing for India when they batted 2nd = 7, 6, 5 and 4.

Number of matches when India played 7 specialist batsmen & batted 2nd = 61.

Number of matches when India played 7 specialist batsmen & batted 2nd & won = 40.

Number of matches when India played 7 specialist batsmen & batted 2nd & lost = 21.

Number of matches when India played 7 specialist batsmen & batted 2nd & tied = 0.

Percentage of matches when India played 7 specialist batsmen & batted 2nd & won = 65.57377.

Percentage of matches when India played 7 specialist batsmen & batted 2nd & lost = 34.42623.

Percentage of matches when India played 7 specialist batsmen & batted 2nd & tied = 0.

Number of matches when India played 6 specialist batsmen & batted 2nd = 203.

Number of matches when India played 6 specialist batsmen & batted 2nd & won = 127.

Number of matches when India played 6 specialist batsmen & batted 2nd & lost = 73.

Number of matches when India played 6 specialist batsmen & batted 2nd & tied = 3.

Percentage of matches when India played 6 specialist batsmen & batted 2nd & won = 62.56158.

Percentage of matches when India played 6 specialist batsmen & batted 2nd & lost = 35.96059.

Percentage of matches when India played 6 specialist batsmen & batted 2nd & tied = 1.477833.

Number of matches when India played 5 specialist batsmen & batted 2nd = 29.

Number of matches when India played 5 specialist batsmen & batted 2nd & won = 14.

Number of matches when India played 5 specialist batsmen & batted 2nd & lost = 15.

Number of matches when India played 5 specialist batsmen & batted 2nd & tied = 0.

Percentage of matches when India played 5 specialist batsmen & batted 2nd & won = 48.27586.

Percentage of matches when India played 5 specialist batsmen & batted 2nd & lost = 51.72414.

Percentage of matches when India played 5 specialist batsmen & batted 2nd & tied = 0.

Number of matches when India played 4 specialist batsmen & batted 2nd = 3.

Number of matches when India played 4 specialist batsmen & batted 2nd & won = 1.

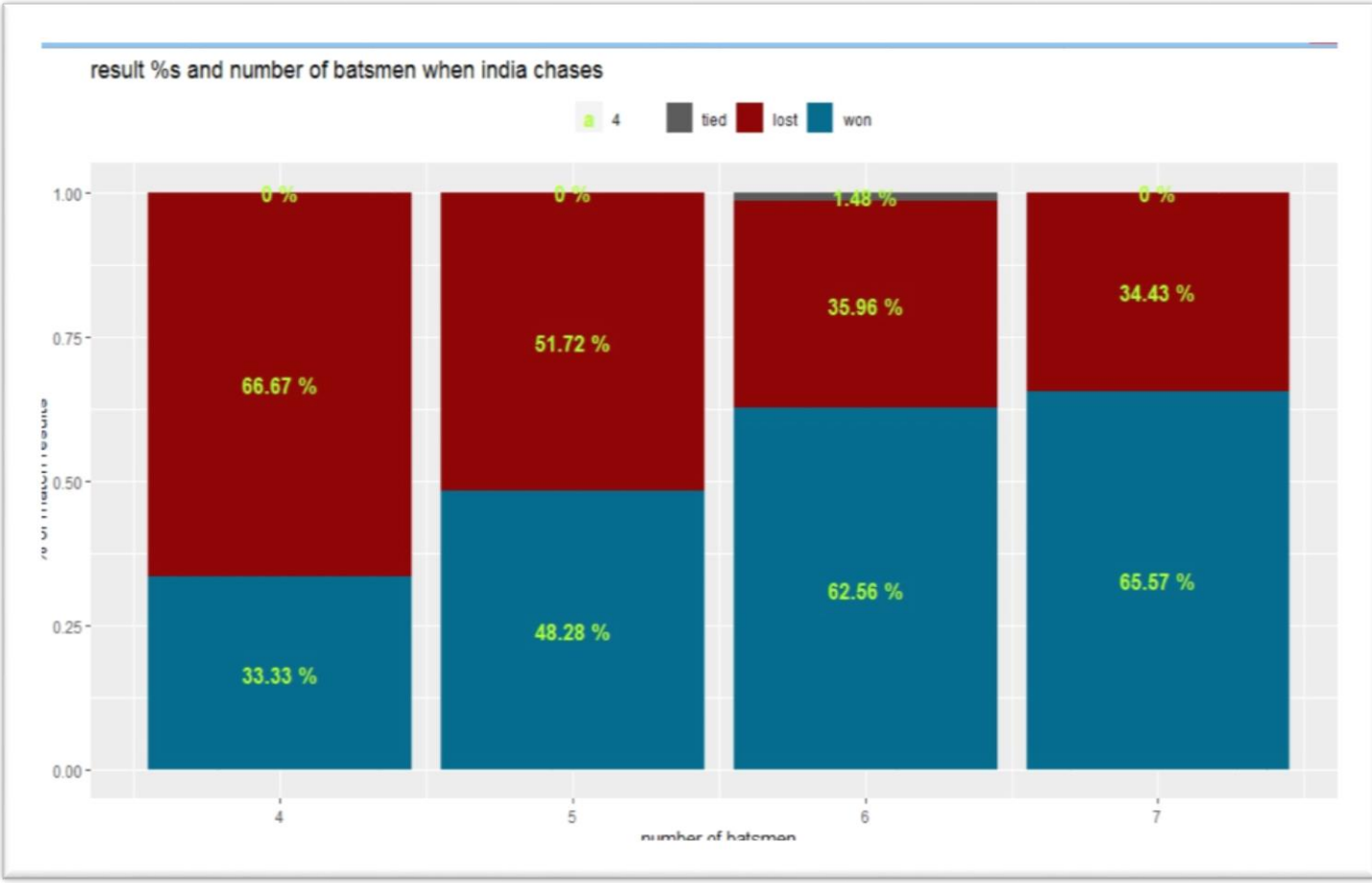
Number of matches when India played 4 specialist batsmen & batted 2nd & lost = 2.

Number of matches when India played 4 specialist batsmen & batted 2nd & tied = 0.

Percentage of matches when India played 4 specialist batsmen & batted 2nd & won = 33.33333.

Percentage of matches when India played 4 specialist batsmen & batted 2nd & lost = 66.66667.

Percentage of matches when India played 4 specialist batsmen & batted 2nd & tied = 0.



25. <u>What is the overall average number of bowlers and the type of bowlers Indian team fields against SENA countries?</u>

Average number of bowlers India plays in Asia = 3.527778.

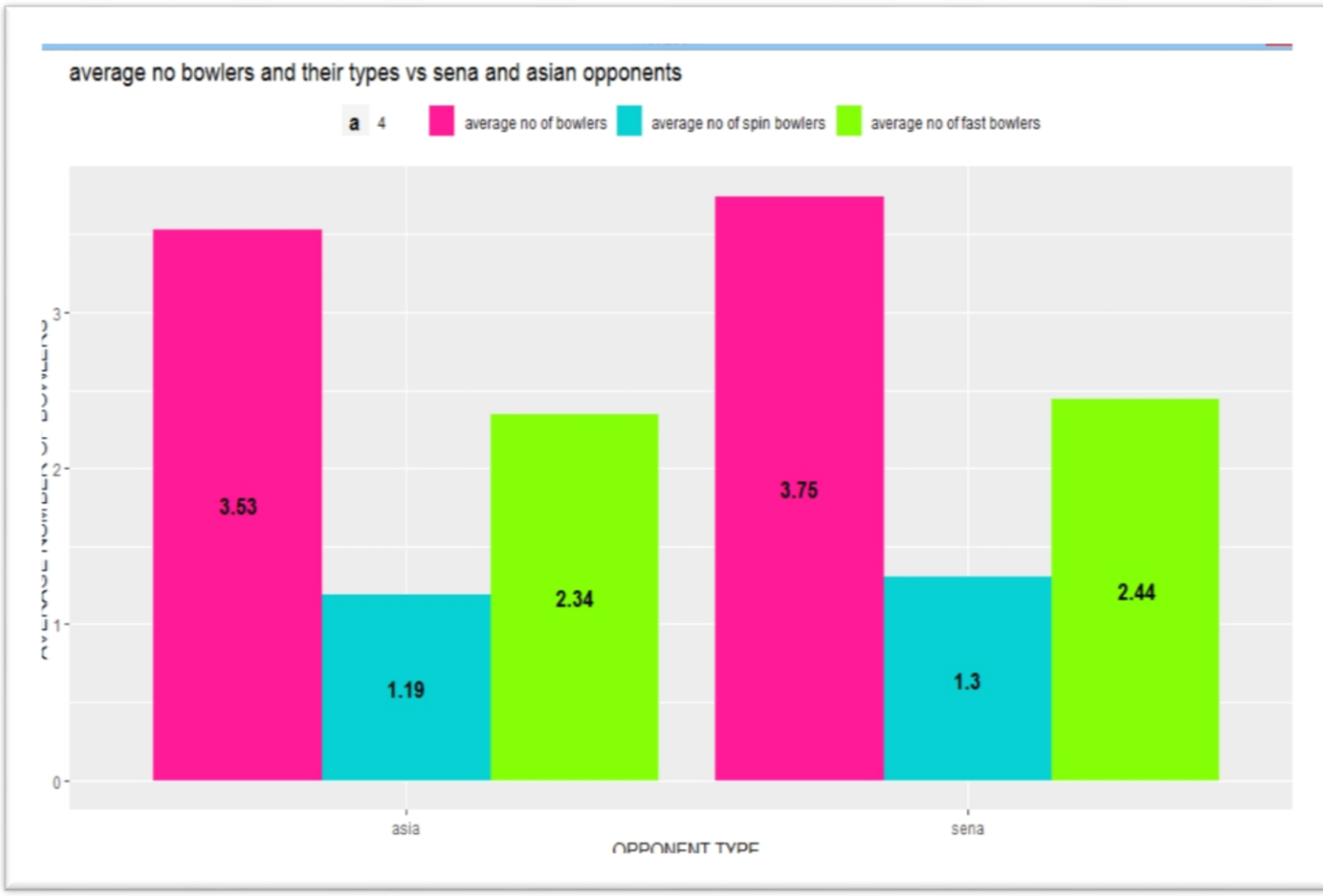
Average number of bowlers India plays in SENA = 3.745205.

Average number of spin bowlers India plays in Asia = 1.30137.

Average number of spin bowlers India plays in SENA = 1.188889.

Average number of fast bowlers India plays in SENA = 2.441096.

Average number of fast bowlers India plays in Asia = 2.344444.



26. <u>What is the overall average number of bowlers and the type of bowlers Indian team fields in SENA and Asian countries?</u>

Average number of bowlers India fields in Asian countries = 3.606349.

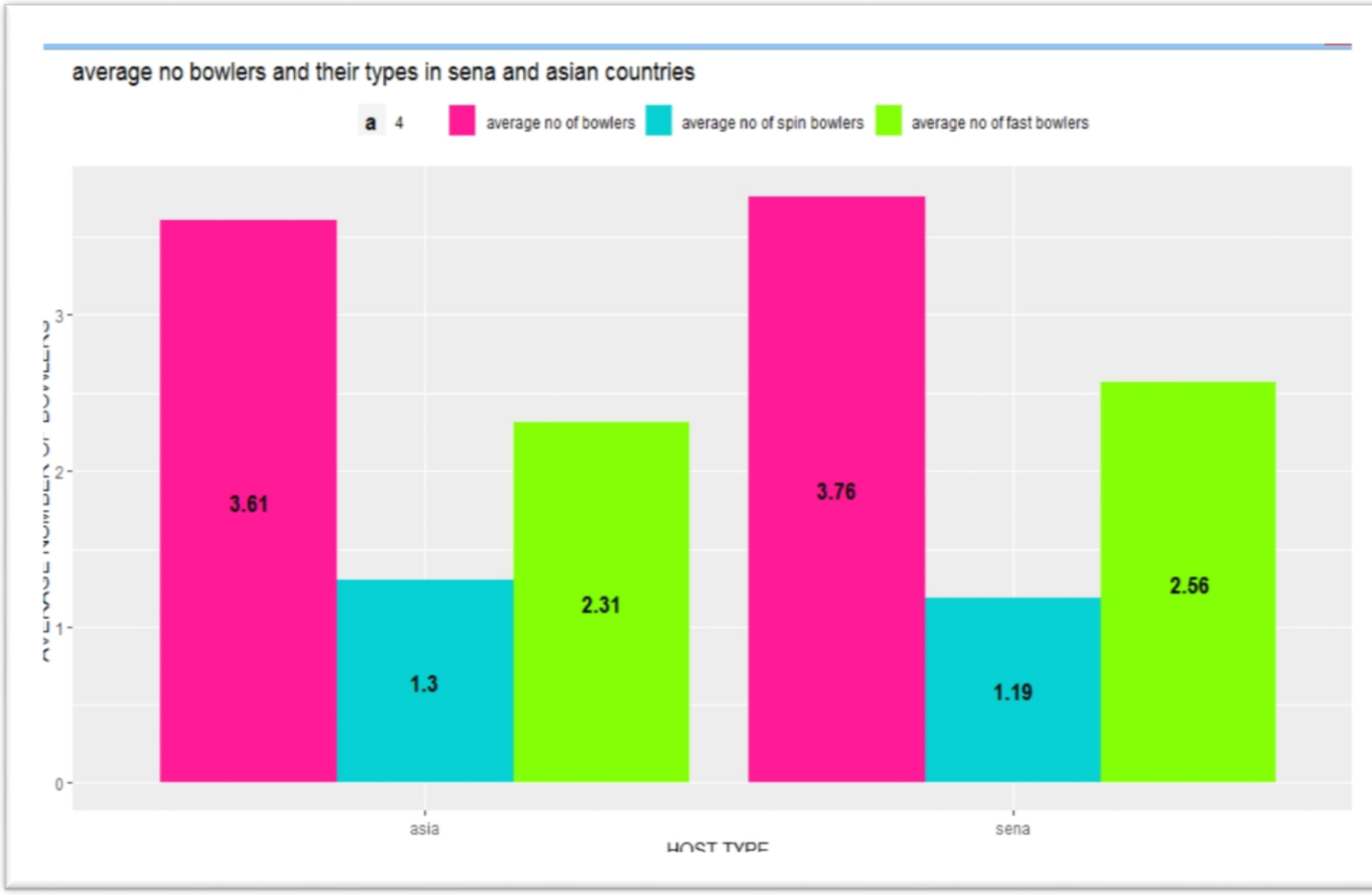
Average number of bowlers India fields in SENA countries = 3.76.

Average number of spin bowlers India fields in Asian countries = 1.301587.

Average number of spin bowlers India fields in SENA countries = 1.19.

Average number of fast bowlers India fields in Asian countries = 2.307937.

Average number of fast bowlers India fields in SENA countries = 2.565.



27. <u>What is the number of matches played by various combination of bowlers?</u>

Number of matches played by (4 bowlers~ 0 spinners + 4 fast bowlers) = 7

Number of matches played by (5 bowlers~ 1 spinners + 4 fast bowlers) = 2

Number of matches played by (3 bowlers~ 0 spinners + 3 fast bowlers) = 9

Number of matches played by (4 bowlers~ 1 spinners + 3 fast bowlers) = 217

Number of matches played by (5 bowlers~ 2 spinners + 3 fast bowlers) = 12

Number of matches played by (3 bowlers~ 1 spinners + 2 fast bowlers) = 132

Number of matches played by (4 bowlers~ 2 spinners + 2 fast bowlers) = 128

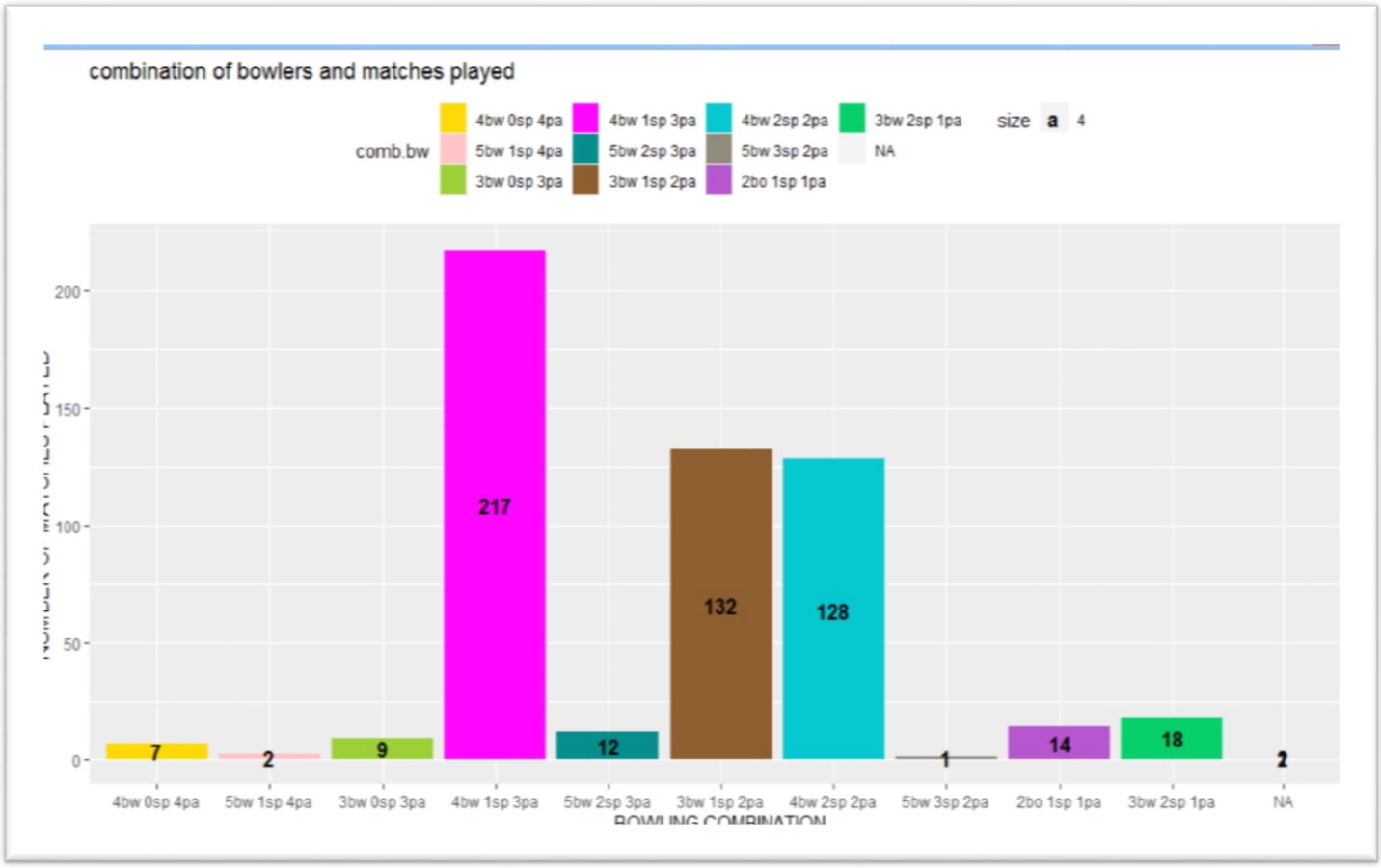
Number of matches played by (5 bowlers~ 3 spinners + 2 fast bowlers) = 1

Number of matches played by (2 bowlers~ 1 spinners + 1 fast bowlers) = 14

Number of matches played by (3 bowlers~ 2 spinners + 1 fast bowlers) = 18

Number of matches played by (3 bowlers~ 3 spinners + 0 fast bowlers) = 1

Number of matches played by (2 bowlers~ 0 spinners + 2 fast bowlers) = 2



28. <u>How does the various combinations of bowlers and the type of bowlers Indian team fields affect the outcome of the match?</u>

Percentage of matches won by (4 bowlers~ 0 spinners + 4 fast bowlers) = 57.142857

Percentage of matches won by (5 bowlers~ 1 spinners + 4 fast bowlers) = 100.000000

Percentage of matches won by (3 bowlers~ 0 spinners + 3 fast bowlers) = 66.666667

Percentage of matches won by (4 bowlers~ 1 spinners + 3 fast bowlers) = 59.447005

Percentage of matches won by (5 bowlers~ 2 spinners + 3 fast bowlers) = 50

Percentage of matches won by (3 bowlers~ 1 spinners + 2 fast bowlers) = 60.606061

Percentage of matches won by (4 bowlers~ 2 spinners + 2 fast bowlers) = 56.250000

Percentage of matches won by (5 bowlers~ 3 spinners + 2 fast bowlers) = 0

Percentage of matches won by (2 bowlers~ 1 spinners + 1 fast bowlers) = 64.285714

Percentage of matches won by (3 bowlers~ 2 spinners + 1 fast bowlers) = 83.333333

Percentage of matches won by (3 bowlers~ 3 spinners + 0 fast bowlers) = 0

Percentage of matches won by (2 bowlers~ 0 spinners + 2 fast bowlers) = 0

Percentage of matches lost by (4 bowlers~ 0 spinners + 4 fast bowlers) = 42.857143

Percentage of matches lost by (5 bowlers~ 1 spinners + 4 fast bowlers) = 0.000000

Percentage of matches lost by (3 bowlers~ 0 spinners + 3 fast bowlers) = 33.333333

Percentage of matches lost by (4 bowlers~ 1 spinners + 3 fast bowlers) = 39.631336

Percentage of matches lost by (5 bowlers~ 2 spinners + 3 fast bowlers) = 50

Percentage of matches lost by (3 bowlers~ 1 spinners + 2 fast bowlers) = 37.878788

Percentage of matches lost by (4 bowlers~ 2 spinners + 2 fast bowlers) = 42.187500

Percentage of matches lost by (5 bowlers~ 3 spinners + 2 fast bowlers) = 100.000000

Percentage of matches lost by (2 bowlers~ 1 spinners + 1 fast bowlers) = 35.714286

Percentage of matches lost by (3 bowlers~ 2 spinners + 1 fast bowlers) = 16.666667

Percentage of matches lost by (3 bowlers~ 3 spinners + 0 fast bowlers) = 100.000000

Percentage of matches lost by (2 bowlers~ 0 spinners + 2 fast bowlers) = 100.000000

Percentage of matches tied by (4 bowlers~ 0 spinners + 4 fast bowlers) = 0

Percentage of matches tied by (5 bowlers~ 1 spinners + 4 fast bowlers) = 0

Percentage of matches tied by (3 bowlers~ 0 spinners + 3 fast bowlers) = 0

Percentage of matches tied by (4 bowlers~ 1 spinners + 3 fast bowlers) = 0.921659

Percentage of matches tied by (5 bowlers~ 2 spinners + 3 fast bowlers) = 0

Percentage of matches tied by (3 bowlers~ 1 spinners + 2 fast bowlers) = 1.515152

Percentage of matches tied by (4 bowlers~ 2 spinners + 2 fast bowlers) = 1.562500

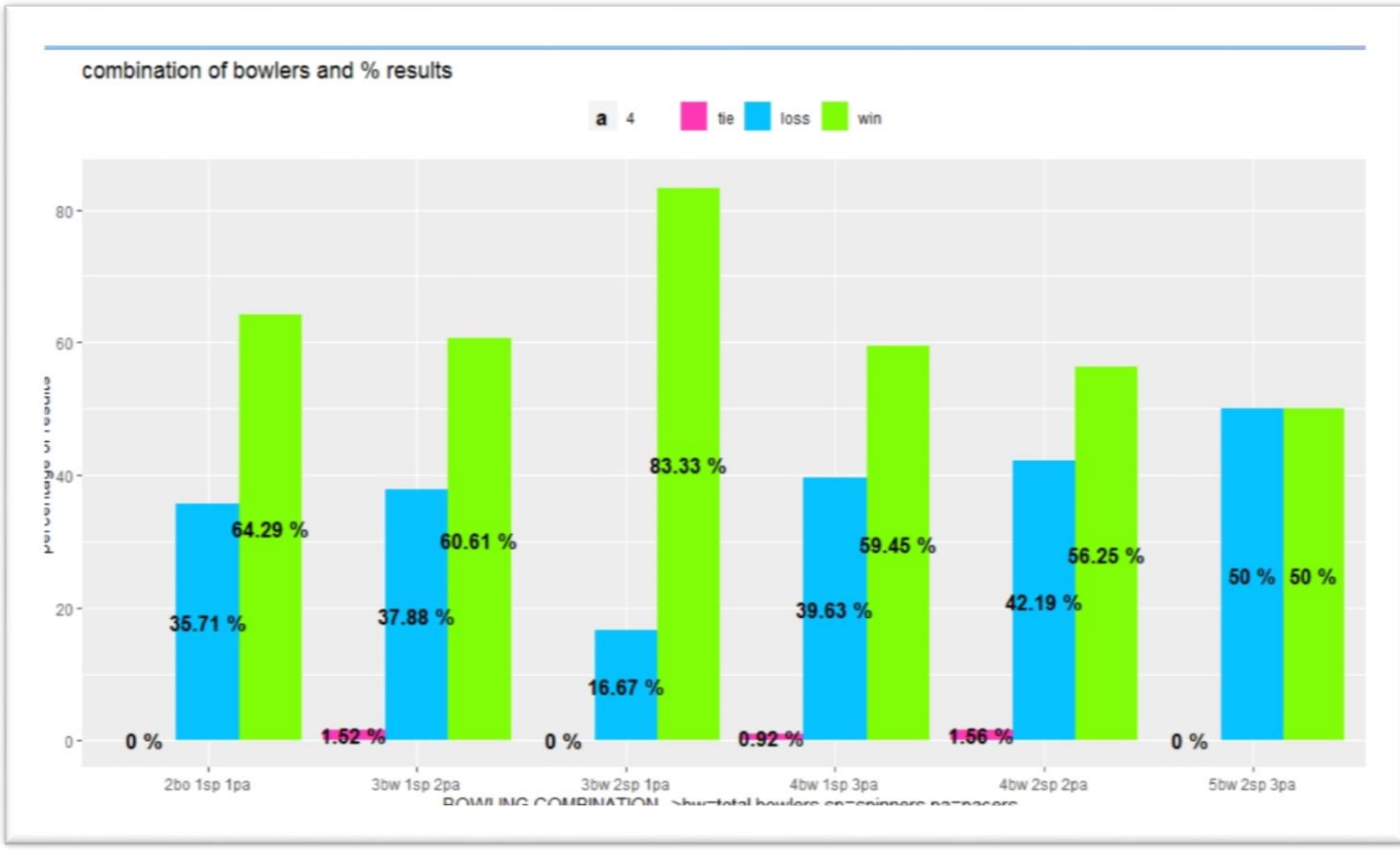
Percentage of matches tied by (5 bowlers~ 3 spinners + 2 fast bowlers) = 0

Percentage of matches tied by (2 bowlers~ 1 spinners + 1 fast bowlers) = 0

Percentage of matches tied by (3 bowlers~ 2 spinners + 1 fast bowlers) = 0

Percentage of matches tied by (3 bowlers~ 3 spinners + 0 fast bowlers) = 0

Percentage of matches tied by (2 bowlers~ 0 spinners + 2 fast bowlers) = 0



- Only those combinations with no of matches > 10.

29. How does the various combinations of bowlers and the type of bowlers Indian team fields in SENA countries affect the outcome of the match?

Percentage of matches won by (4 bowlers~ 0 spinners + 4 fast bowlers) in Asia = 100.000000

Percentage of matches won by (5 bowlers~ 1 spinners + 4 fast bowlers) in Asia = 100.000000

Percentage of matches won by (3 bowlers~ 0 spinners + 3 fast bowlers) in Asia = 80.000000

Percentage of matches won by (4 bowlers~ 1 spinners + 3 fast bowlers) in Asia = 64.000000

Percentage of matches won by (5 bowlers~ 2 spinners + 3 fast bowlers) in Asia = 42.857143

Percentage of matches won by (3 bowlers~ 1 spinners + 2 fast bowlers) in Asia = 61.702128

Percentage of matches won by (4 bowlers~ 2 spinners + 2 fast bowlers) in Asia = 57.317073

Percentage of matches won by (5 bowlers~ 3 spinners + 2 fast bowlers) in Asia = 0

Percentage of matches won by (2 bowlers~ 1 spinners + 1 fast bowlers) in Asia = 75.000000

Percentage of matches won by (3 bowlers~ 2 spinners + 1 fast bowlers) in Asia = 90.000000

Percentage of matches lost by (4 bowlers~ 0 spinners + 4 fast bowlers) in Asia = 0

Percentage of matches lost by (5 bowlers~ 1 spinners + 4 fast bowlers) in Asia = 0.000000

Percentage of matches lost by (3 bowlers~ 0 spinners + 3 fast bowlers) in Asia = 20.000000

Percentage of matches lost by (4 bowlers~ 1 spinners + 3 fast bowlers) in Asia = 35.000000

Percentage of matches lost by (5 bowlers~ 2 spinners + 3 fast bowlers) in Asia = 57.142857

Percentage of matches lost by (3 bowlers~ 1 spinners + 2 fast bowlers) in Asia = 38.297872

Percentage of matches lost by (4 bowlers~ 2 spinners + 2 fast bowlers) in Asia = 40.243902

Percentage of matches lost by (5 bowlers~ 3 spinners + 2 fast bowlers) in Asia = 100.000000

Percentage of matches lost by (2 bowlers~ 1 spinners + 1 fast bowlers) in Asia = 25.000000

Percentage of matches lost by (3 bowlers~ 2 spinners + 1 fast bowlers) in Asia = 90.000000

Percentage of matches tied by (4 bowlers~ 0 spinners + 4 fast bowlers) in Asia = 0

Percentage of matches tied by (5 bowlers~ 1 spinners + 4 fast bowlers) in Asia = 0

Percentage of matches tied by (3 bowlers~ 0 spinners + 3 fast bowlers) in Asia = 0

Percentage of matches tied by (4 bowlers~ 1 spinners + 3 fast bowlers) in Asia = 1.000000

Percentage of matches tied by (5 bowlers~ 2 spinners + 3 fast bowlers) in Asia = 0

Percentage of matches tied by (3 bowlers~ 1 spinners + 2 fast bowlers) in Asia = 0

Percentage of matches tied by (4 bowlers~ 2 spinners + 2 fast bowlers) in Asia = 2.439024

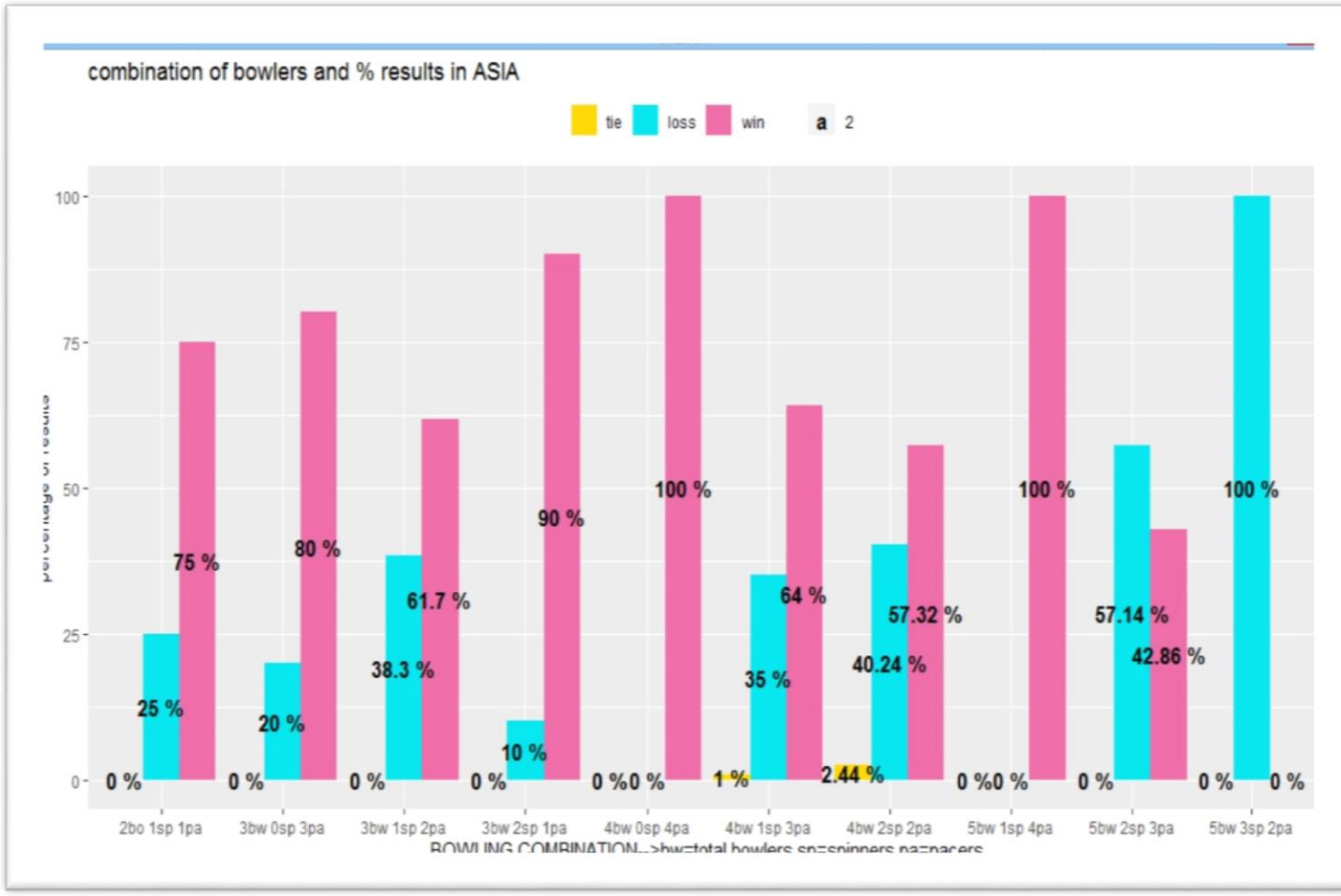
Percentage of matches tied by (5 bowlers~ 3 spinners + 2 fast bowlers) in Asia = 0

Percentage of matches tied by (2 bowlers~ 1 spinners + 1 fast bowlers) in Asia = 0

Percentage of matches tied by (3 bowlers~ 2 spinners + 1 fast bowlers) in Asia = 0

Percentage of matches tied by (3 bowlers~ 3 spinners + 0 fast bowlers) in Asia = 0

Percentage of matches tied by (2 bowlers~ 0 spinners + 2 fast bowlers) in Asia = 0



29. <u>How does the various combinations of bowlers and the type of bowlers Indian team fields in SENA countries affect the outcome of the match?</u>

Percentage of matches won by (4 bowlers~ 0 spinners + 4 fast bowlers) in SENA = 50

Percentage of matches won by (3 bowlers~ 0 spinners + 3 fast bowlers) in SENA = 50.000000

Percentage of matches won by (4 bowlers~ 1 spinners + 3 fast bowlers) in SENA = 54

Percentage of matches won by (5 bowlers~ 2 spinners + 3 fast bowlers) in SENA = 60

Percentage of matches won by (3 bowlers~ 1 spinners + 2 fast bowlers) in SENA = 58.33333

Percentage of matches won by (4 bowlers~ 2 spinners + 2 fast bowlers) in SENA = 58.97436

Percentage of matches won by (2 bowlers~ 1 spinners + 1 fast bowlers) in SENA = 0.000000

Percentage of matches won by (3 bowlers~ 3 spinners + 0 fast bowlers) in SENA = 0

Percentage of matches won by (2 bowlers~ 0 spinners + 2 fast bowlers) in SENA = 0.000000

Percentage of matches won by (3 bowlers~ 2 spinners + 1 fast bowlers) in SENA = 75

Percentage of matches lost by (4 bowlers~ 0 spinners + 4 fast bowlers) in SENA = 50

Percentage of matches lost by (3 bowlers~ 0 spinners + 3 fast bowlers) in SENA = 50

Percentage of matches lost by (4 bowlers~ 1 spinners + 3 fast bowlers) in SENA = 45

Percentage of matches lost by (5 bowlers~ 2 spinners + 3 fast bowlers) in SENA = 40

Percentage of matches lost by (3 bowlers~ 1 spinners + 2 fast bowlers) in SENA = 36.11111

Percentage of matches lost by (4 bowlers~ 2 spinners + 2 fast bowlers) in SENA = 41.02564

Percentage of matches lost by (2 bowlers~ 1 spinners + 1 fast bowlers) in SENA = 100

Percentage of matches lost by (3 bowlers~ 3 spinners + 0 fast bowlers) in SENA = 100

Percentage of matches lost by (2 bowlers~ 0 spinners + 2 fast bowlers) in SENA = 100

Percentage of matches lost by (3 bowlers~ 2 spinners + 1 fast bowlers) in SENA = 25

Percentage of matches tied by (4 bowlers~ 0 spinners + 4 fast bowlers) in SENA = 0

Percentage of matches tied by (3 bowlers~ 0 spinners + 3 fast bowlers) in SENA = 0

Percentage of matches tied by (4 bowlers~ 1 spinners + 3 fast bowlers) in SENA = 64.000000

Percentage of matches tied by (5 bowlers~ 2 spinners + 3 fast bowlers) in SENA = 0

Percentage of matches tied by (3 bowlers~ 1 spinners + 2 fast bowlers) in SENA = 5.555556

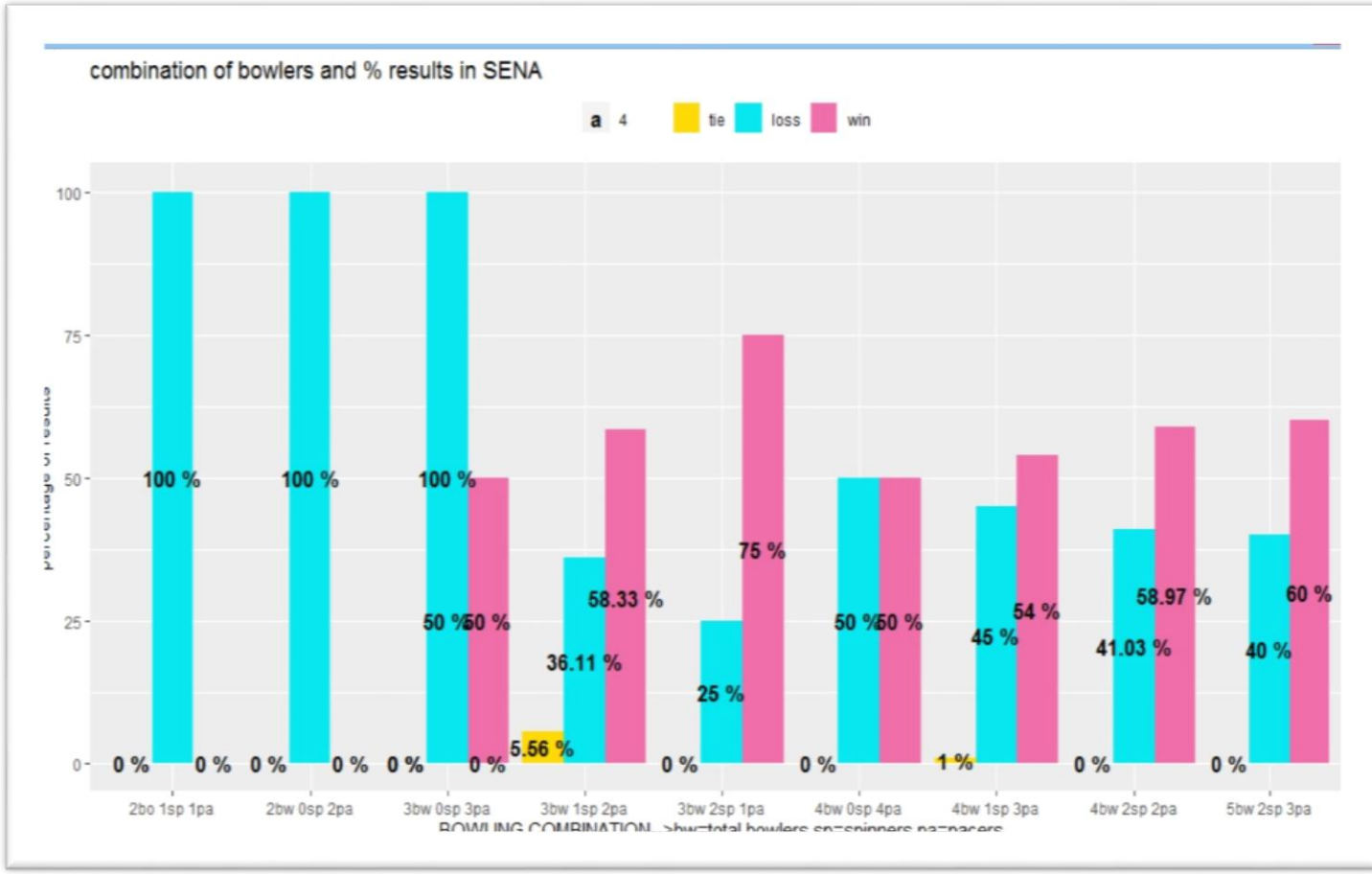
Percentage of matches tied by (4 bowlers~ 2 spinners + 2 fast bowlers) in SENA = 0

Percentage of matches tied by (2 bowlers~ 1 spinners + 1 fast bowlers) in SENA = 0

Percentage of matches tied by (3 bowlers~ 3 spinners + 0 fast bowlers) in SENA = 0

Percentage of matches tied by (2 bowlers~ 0 spinners + 2 fast bowlers) in SENA = 0

Percentage of matches tied by (3 bowlers~ 2 spinners + 1 fast bowlers) in SENA = 0



30. <u>What is India's overall record against test playing nations since 1 January, 2000 in ODI cricket?</u>

Australia= played 79

Australia= won 31

Australia =lost 48

Australia=tied 0

Bangladesh= played 28

Bangladesh= won 23

Bangladesh= lost 5

Bangladesh= tied 0

England= played 65

England= won 39

England= lost 24

England= tied 2

New Zealand= played 51

New Zealand= won 25

New Zealand= lost 25

New Zealand= tied 1

Pakistan= played 54

Pakistan= won 28

Pakistan= lost 26

Pakistan= tied 0

South Africa= played 52

South Africa= won 26

South Africa= lost 26

South Africa= tied 0

Sri Lanka= played 91

Sri Lanka= won 57

Sri Lanka= lost 33

Sri Lanka= tied 1

West Indies= played 67

West Indies= won 43

West Indies= lost 23

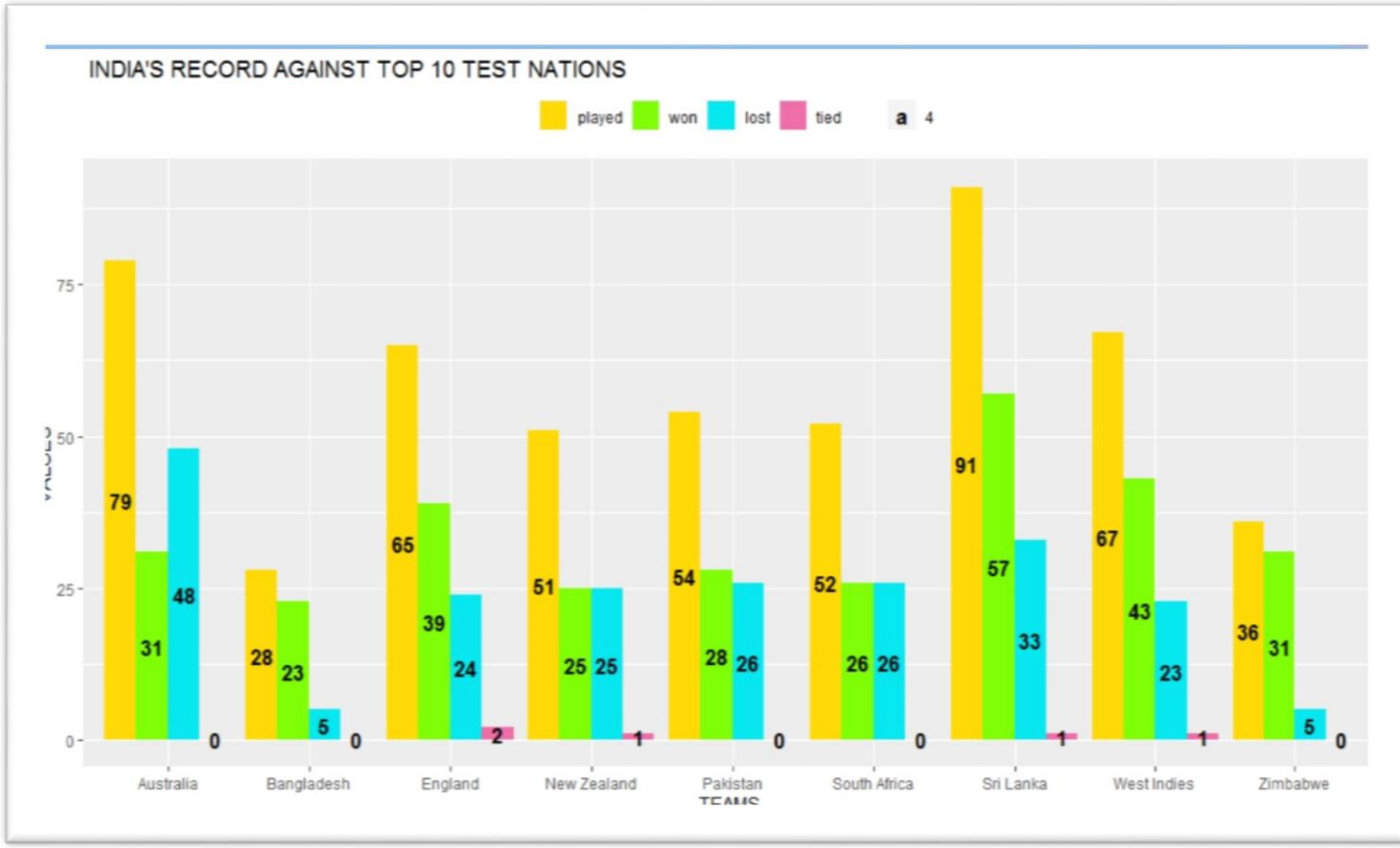
West Indies= tied 1

Zimbabwe= played 36

Zimbabwe= won 31

Zimbabwe= lost 5

Zimbabwe= tied 0



31. <u>What is India's home record against test playing nations since 1 January, 2000 in ODI cricket?</u>

Australia= played 42

Australia= won 20

Australia =lost 22

Australia=tied 0

Bangladesh= played 0

Bangladesh= won 0

Bangladesh= lost 0

Bangladesh= tied 0

England= played 35

England= won 26

England= lost 8

England= tied 1

New Zealand= played 15

New Zealand= won 11

New Zealand= lost 4

New Zealand= tied 0

Pakistan= played 16

Pakistan= won 7

Pakistan= lost 9

Pakistan= tied 0

South Africa= played 18

South Africa= won 9

South Africa= lost 9

South Africa= tied 0

Sri Lanka= played 23

Sri Lanka= won 19

Sri Lanka= lost 4

Sri Lanka= tied 0

West Indies= played 32

West Indies= won 20

West Indies= lost 11

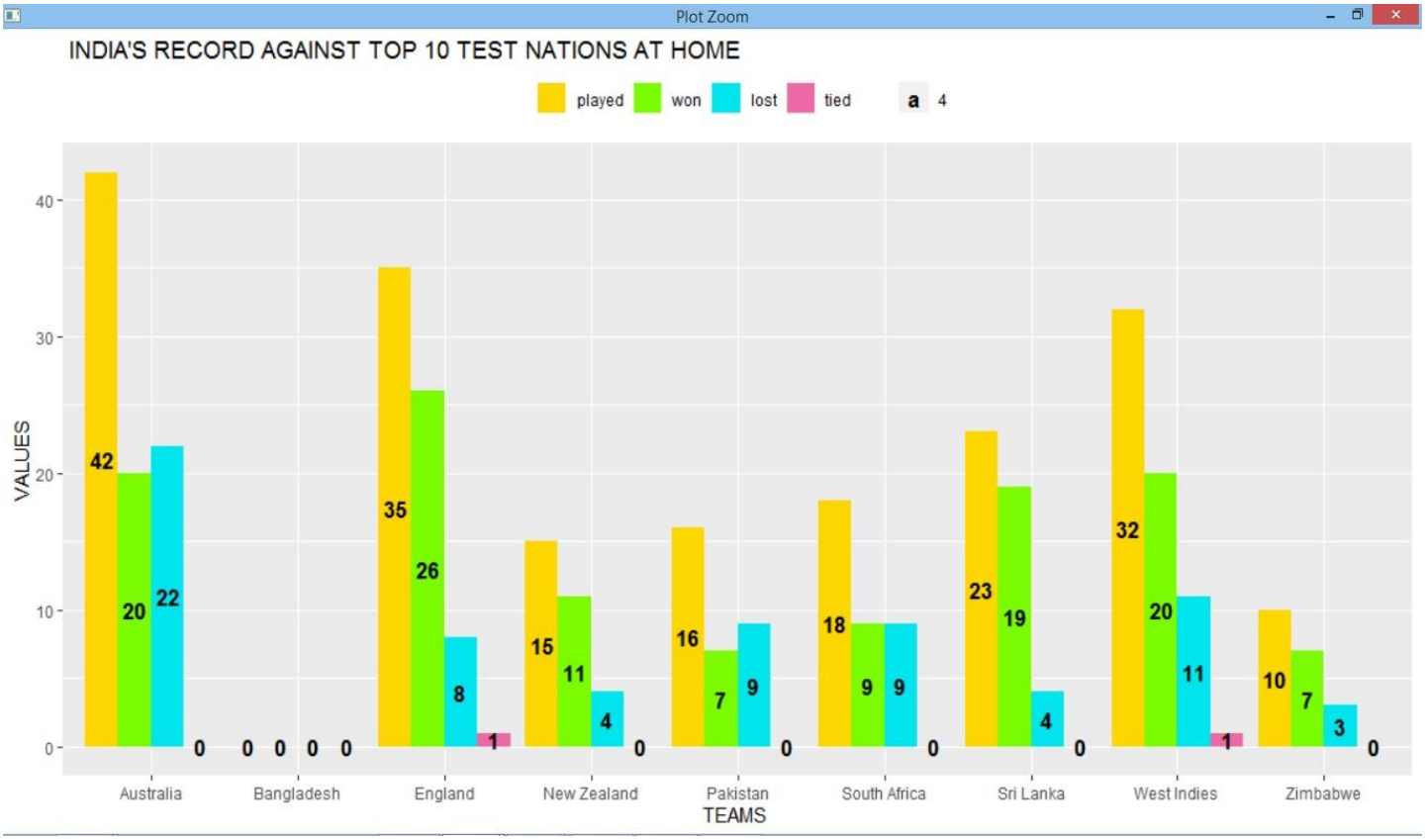
West Indies= tied 1

Zimbabwe= played 10

Zimbabwe= won 7

Zimbabwe= lost 3

Zimbabwe= tied 0



32. <u>What is India's away record against test playing nations since 1 January, 2000 in ODI cricket?</u>

Australia= played 32

Australia= won 9

Australia =lost 23

Australia=tied 0

Bangladesh= played 19

Bangladesh= won 15

Bangladesh= lost 4

Bangladesh= tied 0

England= played 26

England= won 11

England= lost 14

England= tied 1

New Zealand= played 24

New Zealand= won 9

New Zealand= lost 14

New Zealand= tied 1

Pakistan= played 12

Pakistan= won 8

Pakistan= lost 4

Pakistan= tied 0

South Africa= played 21

South Africa= won 8

South Africa= lost 13

South Africa= tied 0

Sri Lanka= played 37

Sri Lanka= won 22

Sri Lanka= lost 15

Sri Lanka= tied 0

West Indies= played 24

West Indies= won 14

West Indies= lost 10

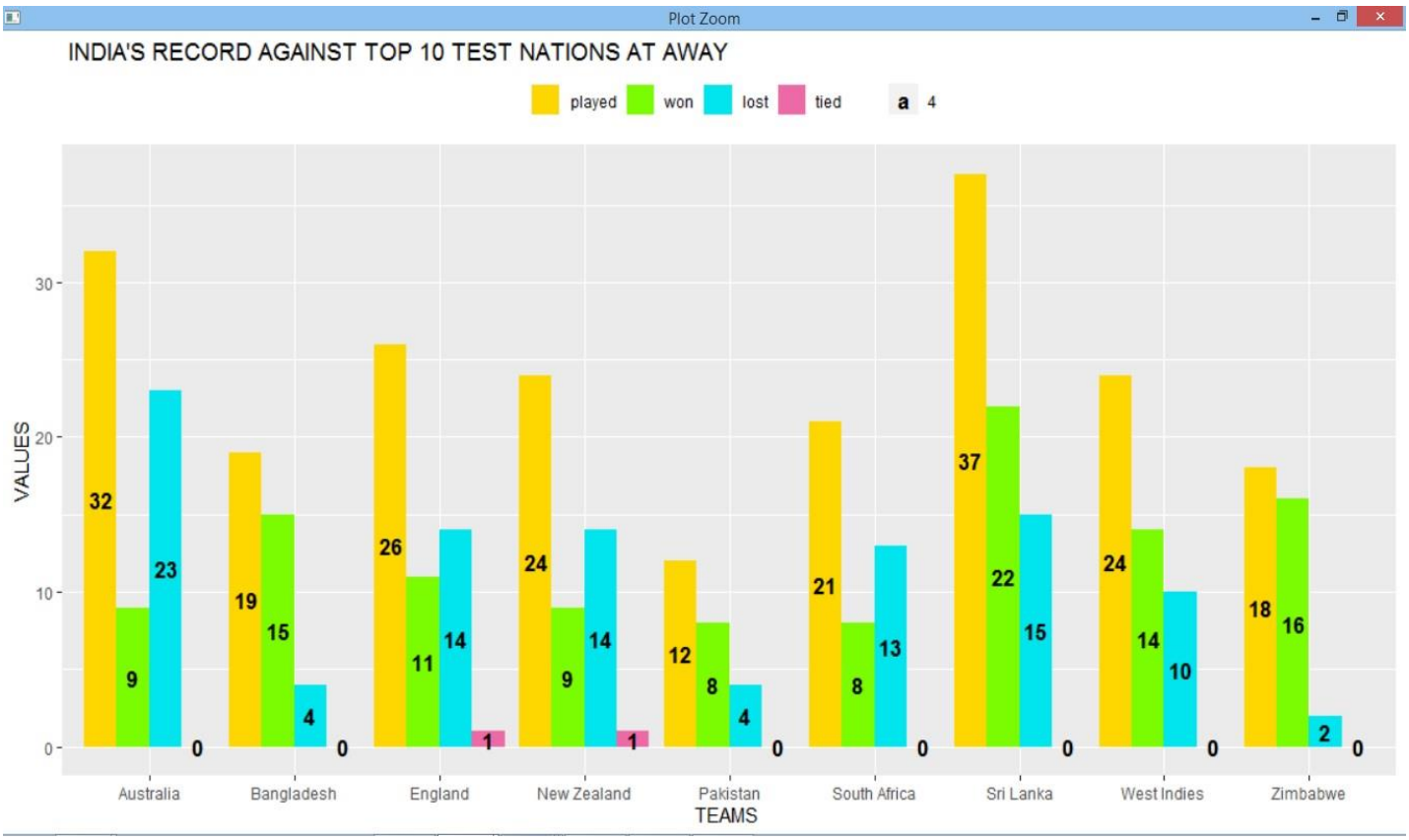
West Indies= tied 0

Zimbabwe= played 18

Zimbabwe= won 16

Zimbabwe= lost 2

Zimbabwe= tied 0



33. <u>What is India's neutral venue record against test playing nations since 1 January, 2000 in ODI cricket?</u>

Australia= played 5

Australia= won 2

Australia =lost 3

Australia=tied 0

Bangladesh= played 9

Bangladesh= won 8

Bangladesh= lost 1

Bangladesh= tied 0

England= played 4

England= won 2

England= lost 2

England= tied 0

New Zealand= played 12

New Zealand= won 5

New Zealand= lost 7

New Zealand= tied 0

Pakistan= played 26

Pakistan= won 13

Pakistan= lost 13

Pakistan= tied 0

South Africa= played 13

South Africa= won 9

South Africa= lost 4

South Africa= tied 0

Sri Lanka= played 31

Sri Lanka= won 16

Sri Lanka= lost 14

Sri Lanka= tied 1

West Indies= played 11

West Indies= won 9

West Indies= lost 2

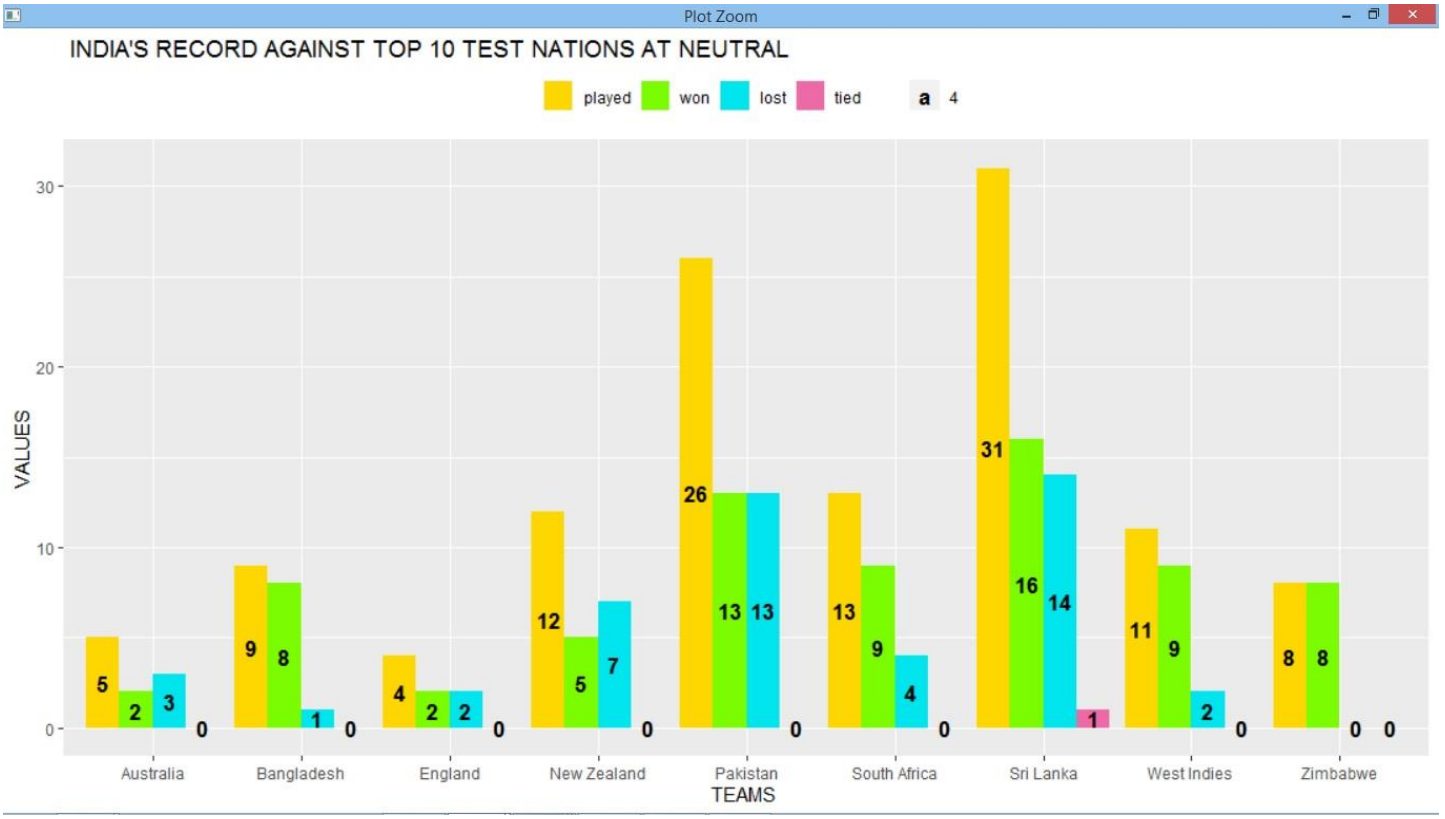
West Indies= tied 0

Zimbabwe= played 8

Zimbabwe= won 8

Zimbabwe= lost 0

Zimbabwe= tied 0



34. <u>How does Indian batsmen scoring centuries in an innings affect the result for India & when they are chasing a score?</u>

Number of matches where at least one Indian batsmen scored a century = 184.

Number of matches won where at least one Indian batsmen scored a century = 137.

Number of matches lost where at least one Indian batsmen scored a century = 45.

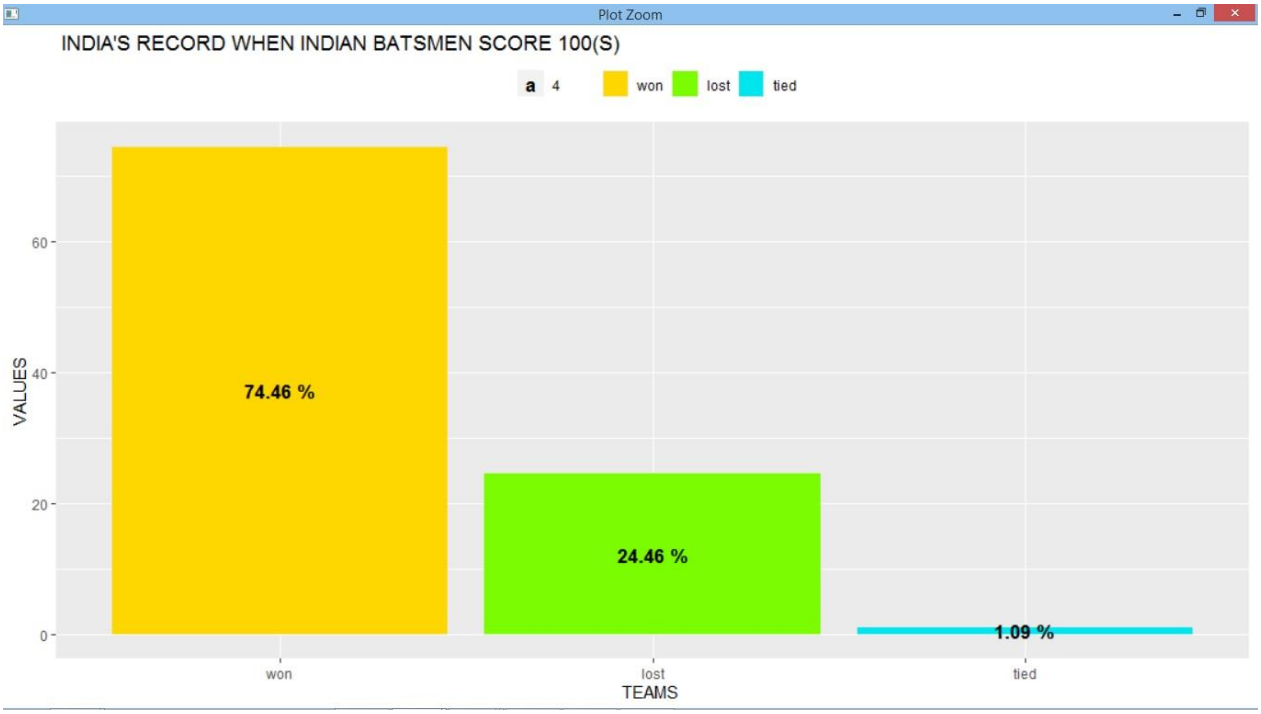
Number of matches lost where at least one Indian batsmen scored a century = 2.

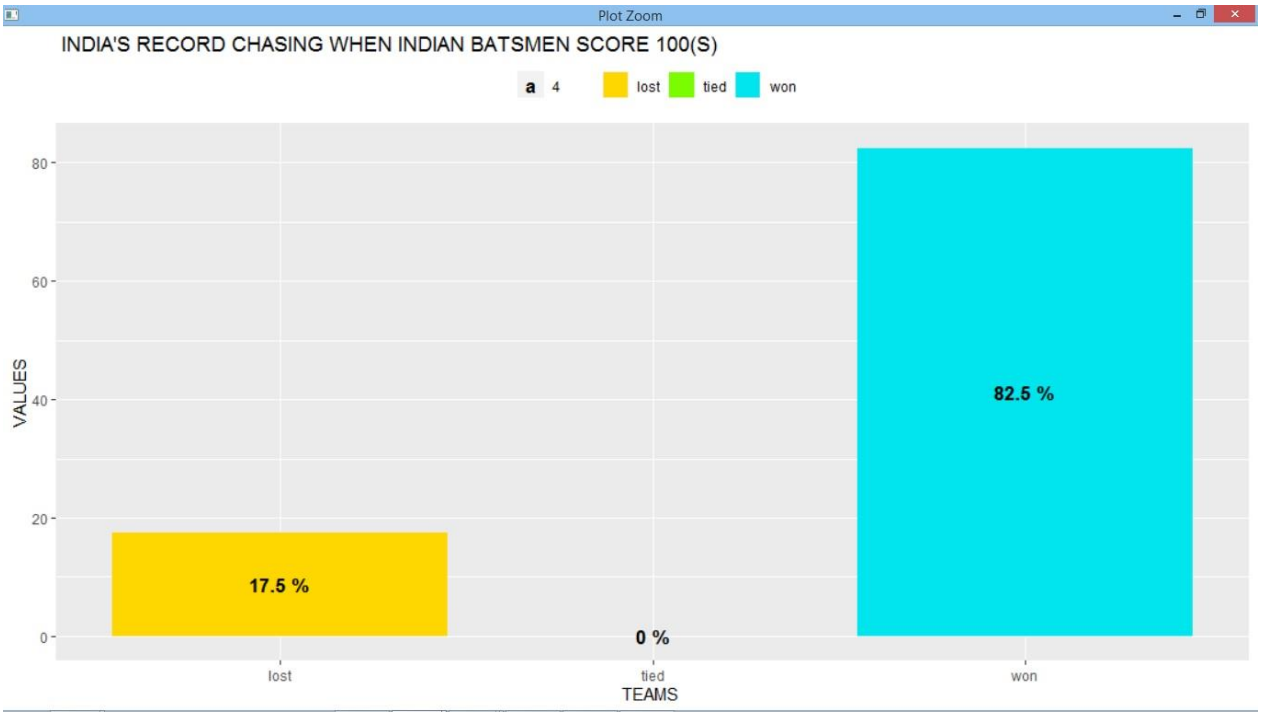
Number of matches where at least one Indian batsmen scored a century & India batted 2^{nd} = 80.

Number of matches won where at least one Indian batsmen scored a century & India batted 2^{nd} = 66.

Number of matches lost where at least one Indian batsmen scored a century & India batted 2^{nd} = 14.

Number of matches lost where at least one Indian batsmen scored a century & India batted 2^{nd} = 2.





35. <u>How does an Indian bowler taking 5+ wickets in an innings affect the overall result for India?</u>

Number of matches where Indian bowler took 5+ wickets= 25.

Number of matches won where Indian bowler took 5+ wickets= 21.

Number of matches lost where Indian bowler took 5+ wickets= 4.

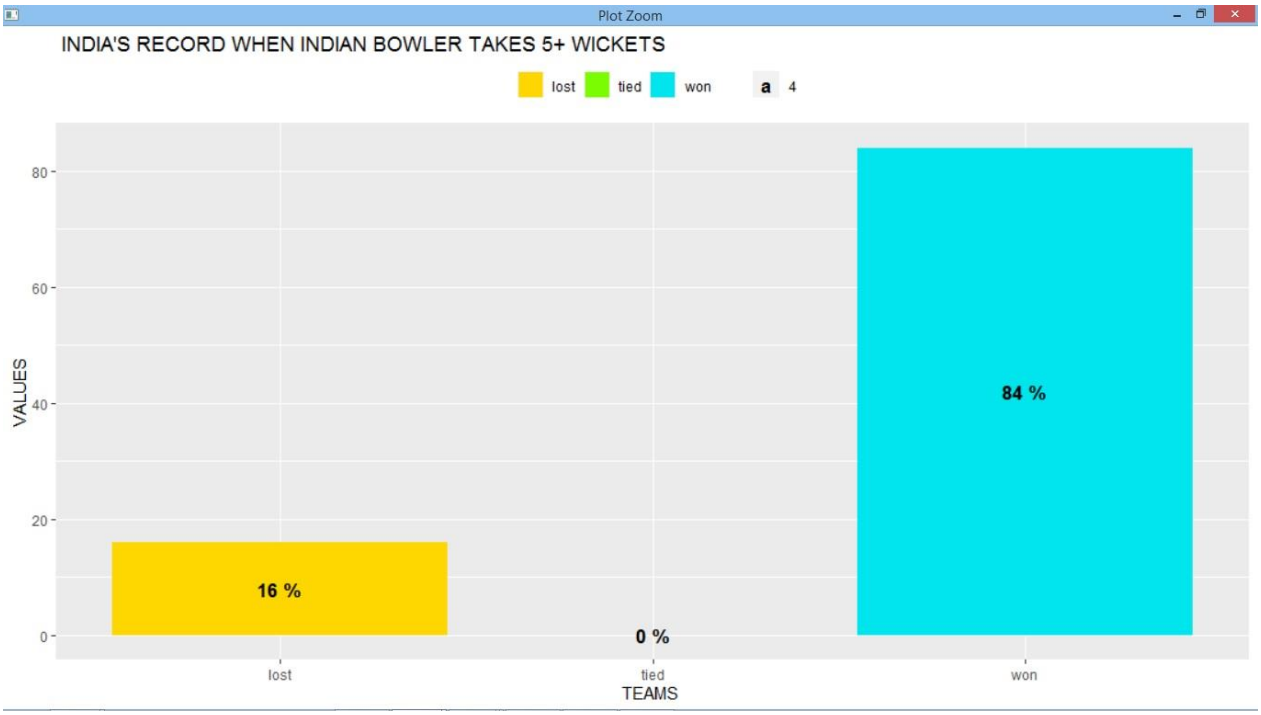
Number of matches lost where Indian bowler took 5+ wickets= 0.

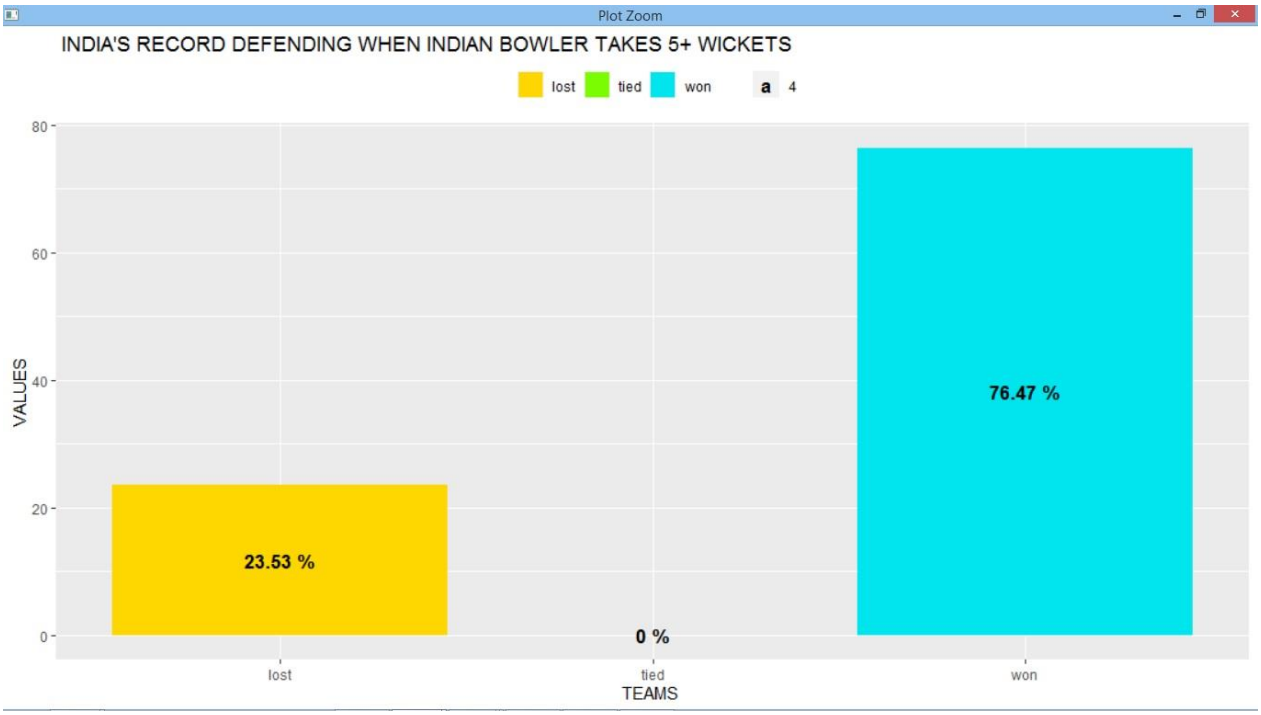
Number of matches where Indian bowler took 5+ wickets& India batted 2nd = 17.

Number of matches won where Indian bowler took 5+ wickets& India batted 2nd = 13.

Number of matches lost where Indian bowler took 5+ wickets& India batted 2nd = 4.

Number of matches lost where Indian bowler took 5+ wickets& India batted 2nd = 0.





REFERENCES

- ESPNCRICINFO WEBSITE

DATA SOURCE

- ESPNCRICINFO WEBSITE

APPENDIX

```
library(RcmdrMisc)
library(effects)
library(ggplot2)
library(reshape)
library(plyr)
library(rlang)
library(foreign)
library(Rcmdr)
library(splines)
library(tidyverse)
# loading the data inyo r console
odidata<- read.csv(file.choose(), header= TRUE)
odidata
#total number of matches played by india since 1 jan , 2000
noofmatches<- nrow(odidata)
noofmatches
#renaming the collumn names of dataset
colnames(odidata)
colnames(odidata)<-
c("team","match.result.for.india","margin","margin.in.wickets","margin.in.runs","toss.r
esult.for.india","batting.turn","opposition","host.country","date","dn.match","day.matc
h","home","away","neutral","sena.host","asian.host","sena.opposition","asian.oppositio
n","no.of.batsmen","no.of.bowlers","no.of.spinners","no.of.pacers","total.allrounders","
```

```
no.of.spin.allrounders","no.of.fast.allrounders","india.runs","india.wickets.lost","opposi
tion.runs","opposition.wickets.lost","100.by.indian.batsmen","no.of.100s.by.india.bats
men","indian.bowlers.taking.5.plus.wickets")
colnames(odidata)
# number of matches won and lost by india since 1 jan 2000
matcheswon<-nrow(odidata[odidata$match.result.for.india=="won",])
matcheswon
#no of matches lost by india since 1 jan 2000
matcheslost<- nrow(odidata[odidata$match.result.for.india=="lost",])
matcheslost
# no of matches india tied since 1 jan 2000
matchestied<-nrow(odidata[odidata$match.result.for.india=="tied",])
matchestied
# percentage of matches won, lost and tied by india since 1 jan 2000
perwon<- matcheswon/noofmatches*100
perwon
perlost<-matcheslost/noofmatches*100
perlost
pertied<-matchestied/noofmatches*100
pertied
#barplot of performance in matches since 1 jan 2000
performancenumber<-c(perwon,perlost,pertied)
performancenumber
performanceparameter<-c("percentage won","percentage lost","percentage tied")
performanceparameter
performance<-
data.frame(parameter=performanceparameter,value=performancenumber)
performance
names(performancenumber)<-performanceparameter
performancenumber
#creating the graph
```

```
gt<-ggplot(performance, aes(x = parameter, y = value, fill = parameter))+geom_col()+geom_text(aes(label = round(performancenumber,2)), vjust = 1.5, colour = "black")+labs(title = "overall performance")+theme(legend.position = "top")
gt#this is the graph
#performance in daynight matches
noofdaynightmatch<-nrow(odidata[odidata$dn.match=="TRUE",])
noofdaynightmatch
noofdaynightmatchwon<-nrow(odidata[odidata$dn.match=="TRUE" & odidata$match.result.for.india=="won",])
noofdaynightmatchwon
noofdaynightmatchlost<-nrow(odidata[odidata$dn.match=="TRUE" & odidata$match.result.for.india=="lost",])
noofdaynightmatchlost
noofdaynightmatchtied<-nrow(odidata[odidata$dn.match=="TRUE" & odidata$match.result.for.india=="tied",])
noofdaynightmatchtied
# percentage of d/n matches won, lost and tied by india since 1 jan 2000
perdaynightwon<-noofdaynightmatchwon/noofdaynightmatch*100
perdaynightwon
perdaynightlost<-noofdaynightmatchlost/noofdaynightmatch*100
perdaynightlost
perdaynighttied<-noofdaynightmatchtied/noofdaynightmatch*100
perdaynighttied
performancedaynightnumber<-c(perdaynightwon,perdaynightlost,perdaynighttied)
performanceparameter<-c("percentage won","percentage lost","percentage tied")
names(performancedaynightnumber)<-performanceparameter
performancedaynightnumber
dnperformance<-
data.frame(parameter=performanceparameter,value=performancedaynightnumber)
dnperformance
```

```
gt2<-ggplot(dnperformance, aes(x = parameter, y = value, fill = parameter))+geom_col()+geom_text(aes(label = round(performancedaynightnumber,2)), vjust = 1.5, colour = "black")+labs(title = "d/n performance")+theme(legend.position = "top")
gt2
# performance in day matches
noofdaymatch<-nrow(odidata[odidata$day.match=="TRUE",])
noofdaymatch
noofdaymatchwon<-nrow(odidata[odidata$day.match=="TRUE" & odidata$match.result.for.india=="won",])
noofdaymatchwon
noofdaymatchlost<-nrow(odidata[odidata$day.match=="TRUE" & odidata$match.result.for.india=="lost",])
noofdaymatchlost
noofdaymatchtied<-nrow(odidata[odidata$day.match=="TRUE" & odidata$match.result.for.india=="tied",])
noofdaymatchtied
# percentage of day matches won, lost and tied by india since 1 jan 2000
perdaywon<-noofdaymatchwon/noofdaymatch*100
perdaywon
perdaylost<-noofdaymatchlost/noofdaymatch*100
perdaylost
perdaytied<-noofdaymatchtied/noofdaymatch*100
perdaytied
performancedaynumber<-c(perdaywon,perdaylost,perdaytied)
performancedaynumber
performanceparameter<-c("percentage won","percentage lost","percentage tied")
names(performancedaynumber)<-performanceparameter
performancedaynumber
dayperformance<-
data.frame(parameter=performanceparameter,value=performancedaynumber)
```

```
dayperformance
gt3<-ggplot(dayperformance, aes(x = parameter, y = value, fill = parameter))+geom_col()+geom_text(aes(label = round(performancedaynumber,2)), vjust = 1.5, colour = "black")+labs(title = "day performance")+theme(legend.position = "top")
gt3

#-------------------------------------------------------
#comparative graphical representation of overall day and d/n matches
matchtype.comp<-c("overall","overall","overall","dn","dn","dn","day","day","day")
resulttype.comp<-
c("win%","loss%","tie%","win%","loss%","tie%","win%","loss%","tie%")
value.comp<-
c(perwon,perlost,pertied,perdaynightwon,perdaynightlost,perdaynighttied,perdaywon,perdaylost,perdaytied)
pp1<-data.frame(matchtype.comp,resulttype.comp,value.comp)
pp1
# creating the y-position for adding labels to the bars
pp1 <- ddply(pp1, .(matchtype.comp),transform, pos = cumsum(value.comp) - (0.5 *value.comp))
pp1
pp1$resulttype.comp <- factor(pp1$resulttype.comp, levels = c("tie%","loss%","win%"))
pp1
#creating the graph
stack.ar<-ggplot(pp1, aes(fill=resulttype.comp, y=value.comp, x=matchtype.comp)) + geom_bar(position="fill", stat="identity")
stack.ar #this is the graph
# adding the labels to the graph
fill <- c("deeppink2", "royalblue2","goldenrod1")
```

```
stack.ar+geom_text(aes(label = paste(round((value.comp),2),"%"),y=pos/100,size = 4,fontface="bold"))+theme(legend.position="top", legend.direction="horizontal", legend.title = element_blank()) + ggtitle("comparison of performance in overall,d/n & day matches") + scale_fill_manual(values=fill)+labs(x = "type of match", y = "% distribution of results")
#--------------------------------------------------

# toss result for india
tosseswon<- nrow(odidata[odidata$toss.result.for.india=="won",])
tosseswon
tosseslost<-nrow(odidata[odidata$toss.result.for.india=="lost",])
tosseslost
pertosswon<- tosseswon/noofmatches*100
pertosswon
pertosslost<-tosseslost/noofmatches*100
pertosslost
pertossresult<-c(pertosswon,pertosslost)
tossresulttype<-c("won","lost")
tossresulttype
tossmatrix<-as.matrix(pertossresult)
tossmatrix
rownames(tossmatrix)<-tossresulttype
colnames(tossmatrix)<-c("percentage")
tossmatrix
tossdf<-as.data.frame(tossmatrix)
tossdf
colnames(tossdf)
# barplot for toss results
ggtoss<-ggplot(tossdf, aes(x = tossresulttype, y = pertossresult, fill = tossresulttype))+geom_col()+geom_text(aes(label = round(percentage,2)), vjust = 1.5, colour = "black")+labs(title = "toss result",x="toss result",y="percentage of
```

```
outcomes")+theme(legend.position = "top")+scale_fill_manual("toss result type",values=c("green","pink"))
ggtoss
# india's decision after winnin toss in overall matches
tosseswon<- nrow(odidata[odidata$toss.result.for.india=="won",])
tosseswon
tosswonbatfirst<-nrow(odidata[odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
tosswonbatfirst
tosswonchase<-nrow(odidata[odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
tosswonchase

# barplot for toss decisions
pertosswonbatfirst<-tosswonbatfirst/tosseswon*100
pertosswonbatfirst
pertosswonbatsecond<-tosswonchase/tosseswon*100
pertosswonbatsecond
decision.type.toss.won<-c("bat 1t","bowl 1st")
percentagetossresult<-c(pertosswonbatfirst,pertosswonbatsecond)
percentagetossresult
tossdecisiondf<- data.frame(decision.type.toss.won,percentagetossresult)
tossdecisiondf
ggtosswon<-ggplot(tossdecisiondf, aes(x = decision.type.toss.won, y = percentagetossresult, fill = decision.type.toss.won))+geom_col()+geom_text(aes(label = round(percentagetossresult,2)), vjust = 1.5, colour = "black")+labs(title = "toss decision percentages",x="toss result",y="percentage of decisions")+theme(legend.position = "top")+scale_fill_manual("toss result decision",values=c("green","pink"))
ggtosswon
```

```
#-------------------------------------------------------------------------------------------------
--
# comparison of toss decisions in day vs d/n matches
noofdaymatch<-nrow(odidata[odidata$day.match=="TRUE",])
noofdaymatch
noofdaynightmatch<-nrow(odidata[odidata$dn.match=="TRUE",])
noofdaynightmatch
tosswonindaymatches<-nrow(odidata[odidata$day.match=="TRUE"                    &
odidata$toss.result.for.india=="won",])
tosswonindaymatches
tosswonindnmatches<-nrow(odidata[odidata$dn.match=="TRUE"                      &
odidata$toss.result.for.india=="won",])
tosswonindnmatches
tosswondaydecisionbat<-nrow(odidata[odidata$day.match=="TRUE"                  &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
tosswondaydecisionbat
tosswondaydecisionchase<-nrow(odidata[odidata$day.match=="TRUE"                &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
tosswondaydecisionchase
tosswondndecisionbat<-nrow(odidata[odidata$dn.match=="TRUE"                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
tosswondndecisionbat
tosswondndecisionchase<-nrow(odidata[odidata$dn.match=="TRUE"                  &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
tosswondndecisionchase
pertossdaybatfirst<-tosswondaydecisionbat/tosswonindaymatches*100
pertossdaybatfirst
pertossdnbatfirst<-tosswondndecisionbat/tosswonindnmatches*100
pertossdnbatfirst
pertossdaychase<-tosswondaydecisionchase/tosswonindaymatches*100
pertossdaychase
```

```
pertossdnchase<-tosswondndecisionchase/tosswonindnmatches*100
pertossdnchase

# graphical representation of day vs dn matches decision on winning the toss
type.of.match.decision <-c("day bat first","day chase","d-n bat first","d-n chase")
type.of.match.decision
day.dn.toss.decision.per<-
c(pertossdaybatfirst,pertossdaychase,pertossdnbatfirst,pertossdnchase)
day.dn.toss.decision.per
df.day.dn.toss.decision<-data.frame(type.of.match.decision,day.dn.toss.decision.per)
df.day.dn.toss.decision
ggtosswon.day.dn<-ggplot(df.day.dn.toss.decision, aes(x = type.of.match.decision, y =
day.dn.toss.decision.per, fill =
type.of.match.decision))+geom_col()+geom_text(aes(label =
round(day.dn.toss.decision.per,2)), vjust = 1.5, colour = "black")+labs(title = "toss
decision percentages in day VS d/n matches",x="mactch type and
decision",y="percentage of decisions")+theme(legend.position =
"top")+scale_fill_manual("toss result
decision",values=c("darkorange","goldenrod1","royalblue3","cyan"))
ggtosswon.day.dn

#------------------------------------------------------------------------
# toss decision depending on host country
# SENA stands for south africa, england(uk),new zealand, australia
# 1. tosses won in sena countries
tosswoninsena<-nrow(odidata[odidata$sena.host=="TRUE" &
odidata$toss.result.for.india=="won",])
tosswoninsena
# 2. tosses lost in sena
tosslostsena<-nrow(odidata[odidata$sena.host=="TRUE" &
odidata$toss.result.for.india=="lost",])
```

```
tosslostsena
#3. number of matches in sena
matchessena<-nrow(odidata[odidata$sena.host=="TRUE",])
matchessena
# ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
#1. tosses won in asian countries
tosswonasia<-nrow(odidata[odidata$asian.host=="TRUE"                    &
odidata$toss.result.for.india=="won",])
tosswonasia
#2. tosses lost in asian countries
tosslostasia<-nrow(odidata[odidata$asian.host=="TRUE"                   &
odidata$toss.result.for.india=="lost",])
tosslostasia
#3. matches held in asian countries
matchesasia<-nrow(odidata[odidata$asian.host=="TRUE",])
matchesasia
#-----------------------------------------------------------------------
# decision making depending upon host country
#1. no and percentage of times india decided to bat first in sena
# no of times
dx1<-nrow(odidata[odidata$sena.host=="TRUE"                             &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
dx1
#percentage of times
perdx1<-dx1/tosswoninsena*100
perdx1
#2. no and percentage of times india decided to chase in sena
# no of times
dx2<-nrow(odidata[odidata$sena.host=="TRUE"                             &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
dx2
```

```
#percentage of times
perdx2<-dx2/tosswoninsena*100
perdx2
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++
#1. no and percentage of times india decided to bat first in asia
# no of times
dx3<-nrow(odidata[odidata$asian.host=="TRUE"                                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
dx3
#percentage of times
perdx3<-dx3/tosswonasia*100
perdx3
#2. no and percentage of times india decided to chase in asia
# no of times
dx4<-nrow(odidata[odidata$asian.host=="TRUE"                                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
dx4
#percentage of times
perdx4<-dx4/tosswonasia*100
perdx4

#-------------------------------------------------------------------------------------------
#comparative graphical representation of allrounders and decision
host.type<-c("SENA","SENA","ASIA","ASIA")
host.type
dec.host.type<-c("BAT 1ST","BAT 2ND","BAT 1ST","BAT 2ND")
dec.host.type
dec.value.host.type<-c(perdx1,perdx2,perdx3,perdx4)
dec.value.host.type
pp1.host.type<-data.frame(host.type,dec.host.type,dec.value.host.type)
```

```
pp1.host.type
# creating the y-position for adding labels to the bars
pp1.host.type <- ddply(pp1.host.type, .(host.type),transform, pos = cumsum(100-dec.value.host.type) - (0.5 *(100-dec.value.host.type)))
pp1.host.type
pp1.host.type$dec.host.type <- factor(pp1.host.type$dec.host.type, levels = c("BAT 1ST","BAT 2ND"))

#creating the graph
host.type.toss.decision.graph<-ggplot(pp1.host.type, aes(fill=dec.host.type, y=dec.value.host.type, x=host.type)) + geom_bar(position="fill", stat="identity")
host.type.toss.decision.graph #this is the graph
# adding the labels to the graph
fill <- c("deeppink2", "royalblue2")
host.type.toss.decision.graph+geom_text(aes(label = paste(round((100-dec.value.host.type),2),"%"),y=pos/100,size = 4))+theme(legend.position="top", legend.direction="horizontal", legend.title = element_blank()) + ggtitle("toss decision %s in ASIA vs SENA") + scale_fill_manual("toss decision type",values=fill)+labs(x = "host type", y = "% of decisions post winning toss")


#-------------------------------------------------------------------------------
# toss decision depending upon the number of allrounders
# 1. checking the number of allrounder(s) india have played in matches since 1 jan, 2000
no.of.allrounders<-unique(odidata$total.allrounders)
no.of.allrounders
# thus india have played3,2,1 and no (0) alrrounders in all matches
# now we'll check india's decision on toss depending on the number of allrounders
#+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
# when india played 3 allrounders and india won the toss
```

```
#1. no of such matches
ar3<-nrow(odidata[odidata$total.allrounders==3 &
odidata$toss.result.for.india=="won",])
ar3
#2. no of times india decided to bat first
ar3.bat.first<-nrow(odidata[odidata$total.allrounders==3 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
ar3.bat.first
#3. no of times india decided to chase
ar3.chase<-nrow(odidata[odidata$total.allrounders==3 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
ar3.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.ar3.bat.first<-ar3.bat.first/ar3*100
per.ar3.bat.first
#5. percentage batting second
per.ar3.chase<-ar3.chase/ar3*100
per.ar3.chase
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
# when india played 2 allrounders and india won the toss
#1. no of such matches
ar2<-nrow(odidata[odidata$total.allrounders==2 &
odidata$toss.result.for.india=="won",])
ar2
#2. no of times india decided to bat first
ar2.bat.first<-nrow(odidata[odidata$total.allrounders==2 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
ar2.bat.first
```

```
#3. no of times india decided to chase
ar2.chase<-nrow(odidata[odidata$total.allrounders==2                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
ar2.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.ar2.bat.first<-ar2.bat.first/ar2*100
per.ar2.bat.first
#5. percentage batting second
per.ar2.chase<-ar2.chase/ar2*100
per.ar2.chase
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++
# when india played 1 allrounder and india won the toss
#1. no of such matches
ar1<-nrow(odidata[odidata$total.allrounders==1                    &
odidata$toss.result.for.india=="won",])
ar1
#2. no of times india decided to bat first
ar1.bat.first<-nrow(odidata[odidata$total.allrounders==1                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
ar1.bat.first
#3. no of times india decided to chase
ar1.chase<-nrow(odidata[odidata$total.allrounders==1                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
ar1.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.ar1.bat.first<-ar1.bat.first/ar1*100
per.ar1.bat.first
#5. percentage batting second
```

```
per.ar1.chase<-ar1.chase/ar1*100
per.ar1.chase
# when india played no allrounder and india won the toss
#1. no of such matches
ar0<-nrow(odidata[odidata$total.allrounders==0                                    &
odidata$toss.result.for.india=="won",])
ar0
#2. no of times india decided to bat first
ar0.bat.first<-nrow(odidata[odidata$total.allrounders==0                          &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
ar0.bat.first
#3. no of times india decided to chase
ar0.chase<-nrow(odidata[odidata$total.allrounders==0                              &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
ar0.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.ar0.bat.first<-ar0.bat.first/ar0*100
per.ar0.bat.first
#5. percentage batting second
per.ar0.chase<-ar0.chase/ar0*100
per.ar0.chase
#-------------------------------------------------------------------------------------
#comparative graphical representation of allrounders and decisions
no.of.allrounders<-sort(no.of.allrounders,decreasing=TRUE)
no.of.allrounders
ar.no<-c(3,3,2,2,1,1,0,0)
ar.no
dec.type<-c("bat 1st","chase","bat 1st","chase","bat 1st","chase","bat 1st","chase")
dec.type
```

```
dec.value<-
c(per.ar3.bat.first,per.ar3.chase,per.ar2.bat.first,per.ar2.chase,per.ar1.bat.first,per.ar1.ch
ase,per.ar0.bat.first,per.ar0.chase)
dec.value
pp1<-data.frame(ar.no,dec.type,dec.value)
pp1
# creating the y-position for adding labels to the bars
pp1 <- ddply(pp1, .(ar.no),transform, pos = cumsum((100-dec.value)) - (0.5 * (100-
dec.value)))
pp1
#creating the graph
stack.ar<-ggplot(pp1, aes(fill=dec.type, y=dec.value, x=ar.no)) +
geom_bar(position="fill", stat="identity")
stack.ar #this is the graph
# adding the labels to the graph
fill <- c("deeppink2", "royalblue2")
stack.ar+geom_text(aes(label = paste(round((100-dec.value),2),"%"),y=pos/100,size =
4))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle("decision %s according to no of allroumders") +
scale_fill_manual(values=fill)+labs(x = "number of allrounders", y = "% of decisions
post winning toss")


#------------------------------------------------------------------------
# match result depending upon the number of bowlers
# 1. checking the number of bowler(s) india have played in matches since 1 jan, 2000
no.of.bowlers<-unique(odidata$no.of.bowlers)
no.of.bowlers
# thus india have played 5,4,3 and 2 bowlers in all matches since 1 jan, 2000
# now we'll check result of the match depending on the number of bowlers
```

```
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++
# when india played 5 bowlers and india won the toss
#1. no of such matches
bow5<-nrow(odidata[odidata$no.of.bowlers==5                                    &
odidata$toss.result.for.india=="won",])
bow5
#2. no of times india decided to bat first
bow5.bat.first<-nrow(odidata[odidata$no.of.bowlers==5                          &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
bow5.bat.first
#3. no of times india decided to chase
bow5.chase<-nrow(odidata[odidata$no.of.bowlers==5                              &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
bow5.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.bow5.bat.first<-bow5.bat.first/bow5*100
per.bow5.bat.first
#5. percentage batting second
per.bow5.chase<-bow5.chase/bow5*100
per.bow5.chase
#-------------------------------------------------------------------------------------------------
------
# when india played 4 bowlers and india won the toss
#1. no of such matches
bow4<-nrow(odidata[odidata$no.of.bowlers==4                                    &
odidata$toss.result.for.india=="won",])
bow4
#2. no of times india decided to bat first
```

```
bow4.bat.first<-nrow(odidata[odidata$no.of.bowlers==4 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
bow4.bat.first
#3. no of times india decided to chase
bow4.chase<-nrow(odidata[odidata$no.of.bowlers==4 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
bow4.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.bow4.bat.first<-bow4.bat.first/bow4*100
per.bow4.bat.first
#5. percentage batting second
per.bow4.chase<-bow4.chase/bow4*100
per.bow4.chase
#-------------------------------------------------------------------------------------------------
------
# when india played 3 bowlers and india won the toss
#1. no of such matches
bow3<-nrow(odidata[odidata$no.of.bowlers==3 &
odidata$toss.result.for.india=="won",])
bow3
#2. no of times india decided to bat first
bow3.bat.first<-nrow(odidata[odidata$no.of.bowlers==3 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
bow3.bat.first
#3. no of times india decided to chase
bow3.chase<-nrow(odidata[odidata$no.of.bowlers==3 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
bow3.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
```

```
per.bow3.bat.first<-bow3.bat.first/bow3*100
per.bow3.bat.first
#5. percentage batting second
per.bow3.chase<-bow3.chase/bow3*100
per.bow3.chase
#-------------------------------------------------------------------------------------------------
------
# when india played 2 bowlers and india won the toss
#1. no of such matches
bow2<-nrow(odidata[odidata$no.of.bowlers==2                                    &
odidata$toss.result.for.india=="won",])
bow2
#2. no of times india decided to bat first
bow2.bat.first<-nrow(odidata[odidata$no.of.bowlers==2                          &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
bow2.bat.first
#3. no of times india decided to chase
bow2.chase<-nrow(odidata[odidata$no.of.bowlers==2                              &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
bow2.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.bow2.bat.first<-bow2.bat.first/bow2*100
per.bow2.bat.first
#5. percentage batting second
per.bow2.chase<-bow2.chase/bow2*100
per.bow2.chase
#-------------------------------------------------------------------------------------------
#comparative graphical representation of allrounders and decisions
no.of.bowlers<-sort(no.of.bowlers,decreasing=TRUE)
no.of.bowlers
```

```
bow.no<-c(5,5,4,4,3,3,2,2)
bow.no
dec.type<-c("bat 1st","chase","bat 1st","chase","bat 1st","chase","bat 1st","chase")
dec.type
dec.value.2<-
c(per.bow5.bat.first,per.bow5.chase,per.bow4.bat.first,per.bow4.chase,per.bow3.bat.firs
t,per.bow3.chase,per.bow2.bat.first,per.bow2.chase)
dec.value.2
pp1.bow<-data.frame(bow.no,dec.type,dec.value.2)
pp1.bow
# creating the y-position for adding labels to the bars
pp1.bow <- ddply(pp1.bow, .(bow.no),transform, pos = cumsum((100-dec.value.2)) -
(0.5 * (100-dec.value.2)))
pp1.bow
#creating the graph
stack.bow<-ggplot(pp1.bow, aes(fill=dec.type, y=dec.value.2, x=bow.no)) +
geom_bar(position="fill", stat="identity")
stack.bow#this is the graph
# adding the labels to the graph
fill <- c("lawngreen", "dodgerblue")
stack.bow+geom_text(aes(label = paste(round((100-
dec.value.2),2),"%"),y=pos/100,size = 4))+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("decision %s
according to no of bowlers") + scale_fill_manual(values=fill)+labs(x = "number of
bowlers", y = "% of decisions post winning toss")



#------------------------------------------------------------------------
# toss decision depending upon the number of batsmen
# 1. checking the number of batsmen india have played in matches since 1 jan, 2000
no.of.batsmen<-unique(odidata$no.of.batsmen)
```

```
no.of.batsmen
# thus india have played 7,6,5 and 4 batsmen in all matches since 1 jan, 2000
# now we'll check india's decision on toss depending on the number of batsmen
#+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++
# when india played 7 batsmen and india won the toss
#1. no of such matches
bat7<-nrow(odidata[odidata$no.of.batsmen==7                                    &
odidata$toss.result.for.india=="won",])
bat7
#2. no of times india decided to bat first
bat7.bat.first<-nrow(odidata[odidata$no.of.batsmen==7                          &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
bat7.bat.first
#3. no of times india decided to chase
bat7.chase<-nrow(odidata[odidata$no.of.batsmen==7                              &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
bat7.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.bat7.bat.first<-bat7.bat.first/bat7*100
per.bat7.bat.first
#5. percentage batting second
per.bat7.chase<-bat7.chase/bat7*100
per.bat7.chase

#-------------------------------------------------------------------------------------------------
------
# when india played 6 batsmen and india won the toss
#1. no of such matches
```

```
bat6<-nrow(odidata[odidata$no.of.batsmen==6 &
odidata$toss.result.for.india=="won",])
bat6
#2. no of times india decided to bat first
bat6.bat.first<-nrow(odidata[odidata$no.of.batsmen==6 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
bat6.bat.first
#3. no of times india decided to chase
bat6.chase<-nrow(odidata[odidata$no.of.batsmen==6 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
bat6.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.bat6.bat.first<-bat6.bat.first/bat6*100
per.bat6.bat.first
#5. percentage batting second
per.bat6.chase<-bat6.chase/bat6*100
per.bat6.chase


#-------------------------------------------------------------------------------------------
------
# when india played 5 batsmen and india won the toss
#1. no of such matches
bat5<-nrow(odidata[odidata$no.of.batsmen==5 &
odidata$toss.result.for.india=="won",])
bat5
#2. no of times india decided to bat first
bat5.bat.first<-nrow(odidata[odidata$no.of.batsmen==5 &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
bat5.bat.first
```

```
#3. no of times india decided to chase
bat5.chase<-nrow(odidata[odidata$no.of.batsmen==5                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
bat5.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.bat5.bat.first<-bat5.bat.first/bat5*100
per.bat5.bat.first
#5. percentage batting second
per.bat5.chase<-bat5.chase/bat5*100
per.bat5.chase

#-------------------------------------------------------------------------------------------------
------
# when india played 4 batsmen and india won the toss
#1. no of such matches
bat4<-nrow(odidata[odidata$no.of.batsmen==4                    &
odidata$toss.result.for.india=="won",])
bat4
#2. no of times india decided to bat first
bat4.bat.first<-nrow(odidata[odidata$no.of.batsmen==4                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="1st",])
bat4.bat.first
#3. no of times india decided to chase
bat4.chase<-nrow(odidata[odidata$no.of.batsmen==4                    &
odidata$toss.result.for.india=="won" & odidata$batting.turn=="2nd",])
bat4.chase
# now we calculate the percentage of such instances of decision
#4. percentage batting first
per.bat4.bat.first<-bat4.bat.first/bat4*100
per.bat4.bat.first
```

```
#5. percentage batting second
per.bat4.chase<-bat4.chase/bat4*100
per.bat4.chase

#-----------------------------------------------------------------------------------------
#comparative graphical representation of allrounders and decisions
no.of.batsmen<-sort(no.of.batsmen,decreasing=TRUE)
no.of.batsmen
bat.no<-c(7,7,6,6,5,5,4,4)
bat.no
dec.type<-c("bat 1st","chase","bat 1st","chase","bat 1st","chase","bat 1st","chase")
dec.type
dec.value.3<-
c(per.bat7.bat.first,per.bat7.chase,per.bat6.bat.first,per.bat6.chase,per.bat5.bat.first,per.
bat5.chase,per.bat4.bat.first,per.bat4.chase)
dec.value.3
pp1.bat<-data.frame(bat.no,dec.type,dec.value.3)
pp1.bat
# creating the y-position for adding labels to the bars
pp1.bat <- ddply(pp1.bat, .(bat.no),transform, pos = cumsum((100-dec.value.3)) - (0.5 *
(100-dec.value.3)))
pp1.bat
#creating the graph
stack.bat<-ggplot(pp1.bat, aes(fill=dec.type, y=dec.value.3, x=bat.no)) +
geom_bar(position="fill", stat="identity")
stack.bat#this is the graph
# adding the labels to the graph
fill <- c("lawngreen", "dodgerblue")
stack.bat+geom_text(aes(label = paste(round((100-dec.value.3),2),"%"),y=pos/100,size
= 4, fontface="bold"))+theme(legend.position="top", legend.direction="horizontal",
legend.title = element_blank()) + ggtitle("decision %s according to no of batsmen") +
```

```
scale_fill_manual(values=fill)+labs(x = "number of batsmen", y = "% of decisions post
winning toss")

#-------------------------------------------------------------------------------------------------------
-------------------------------------------------------------

#How no of bowlers affect the result for india
no.of.bowlers<-sort(no.of.bowlers,decreasing=TRUE)
no.of.bowlers # number of bowlers india has played
# india has played 5,4,3,2 bowlers since 1 jan,2000
# affect on result when india plays 5 bowlers
#1. no of such matches
b5<-nrow(odidata[odidata$no.of.bowlers==5,])
b5
#2. no of matches won
b5.won<-nrow(odidata[odidata$no.of.bowlers==5                                    &
odidata$match.result.for.india=="won",])
b5.won
#3. no of matches lost
b5.lost<-nrow(odidata[odidata$no.of.bowlers==5                                   &
odidata$match.result.for.india=="lost",])
b5.lost
#3. no of matches tied
b5.tied<-nrow(odidata[odidata$no.of.bowlers==5                                   &
odidata$match.result.for.india=="tied",])
b5.tied
#above results in percentages
# winning %
per.b5.won<-b5.won/b5*100
per.b5.won
# loss %
```

```
per.b5.lost<-b5.lost/b5*100
per.b5.lost
# tied %
per.b5.tied<-b5.tied/b5*100
per.b5.tied

#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++++++
# affect on result when india plays 4 bowlers
#1. no of such matches
b4<-nrow(odidata[odidata$no.of.bowlers==4,])
b4
#2. no of matches won
b4.won<-nrow(odidata[odidata$no.of.bowlers==4                    &
odidata$match.result.for.india=="won",])
b4.won
#3. no of matches lost
b4.lost<-nrow(odidata[odidata$no.of.bowlers==4                   &
odidata$match.result.for.india=="lost",])
b4.lost
#3. no of matches tied
b4.tied<-nrow(odidata[odidata$no.of.bowlers==4                   &
odidata$match.result.for.india=="tied",])
b4.tied
#above results in percentages
# winning %
per.b4.won<-b4.won/b4*100
per.b4.won
# loss %
per.b4.lost<-b4.lost/b4*100
per.b4.lost
```

```
# tied %
per.b4.tied<-b4.tied/b4*100
per.b4.tied

#+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++++++++
# affect on result when india plays 3 bowlers
#1. no of such matches
b3<-nrow(odidata[odidata$no.of.bowlers==3,])
b3
#2. no of matches won
b3.won<-nrow(odidata[odidata$no.of.bowlers==3                    &
odidata$match.result.for.india=="won",])
b3.won
#3. no of matches lost
b3.lost<-nrow(odidata[odidata$no.of.bowlers==3                   &
odidata$match.result.for.india=="lost",])
b3.lost
#3. no of matches tied
b3.tied<-nrow(odidata[odidata$no.of.bowlers==3                   &
odidata$match.result.for.india=="tied",])
b3.tied
#above results in percentages
# winning %
per.b3.won<-b3.won/b3*100
per.b3.won
# loss %
per.b3.lost<-b3.lost/b3*100
per.b3.lost
# tied %
per.b3.tied<-b3.tied/b3*100
```

```
per.b3.tied

#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++++++
# affect on result when india plays 2 bowlers
#1. no of such matches
b2<-nrow(odidata[odidata$no.of.bowlers==2,])
b2
#2. no of matches won
b2.won<-nrow(odidata[odidata$no.of.bowlers==2                    &
odidata$match.result.for.india=="won",])
b2.won
#3. no of matches lost
b2.lost<-nrow(odidata[odidata$no.of.bowlers==2                   &
odidata$match.result.for.india=="lost",])
b2.lost
#3. no of matches tied
b2.tied<-nrow(odidata[odidata$no.of.bowlers==2                   &
odidata$match.result.for.india=="tied",])
b2.tied
#above results in percentages
# winning %
per.b2.won<-b2.won/b2*100
per.b2.won
# loss %
per.b2.lost<-b2.lost/b2*100
per.b2.lost
# tied %
per.b2.tied<-b2.tied/b2*100
per.b2.tied
```

```
#-------------------------------------------------------------------------------------------
#comparative graphical representation of bowlers and decisions
no.of.bowlers<-sort(no.of.bowlers,decreasing=TRUE)
no.of.bowlers
bw.no<-c(5,5,5,4,4,4,3,3,3,2,2,2)
bw.no
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
result.per.bw<-
c(per.b5.won,per.b5.lost,per.b5.tied,per.b4.won,per.b4.lost,per.b4.tied,per.b3.won,per.b
3.lost,per.b3.tied,per.b2.won,per.b2.lost,per.b2.tied)
result.per.bw
bw.numb.result<-data.frame(bw.no,result.type,result.per.bw)
bw.numb.result
# creating the y-position for adding labels to the bars
pp1.bw.res <- ddply(bw.numb.result, .(bw.no),transform, pos = cumsum(result.per.bw) -
(0.5 * result.per.bw))
pp1.bw.res
pp1.bw.res$result.type <- factor(pp1.bw.res$result.type, levels = c("tied","lost","won"))

#creating the graph
no.of.bw.res.graph<-ggplot(pp1.bw.res, aes(fill=result.type, y=result.per.bw, x=bw.no))
+ geom_bar(position="fill", stat="identity")
no.of.bw.res.graph#this is the graph
# adding the labels to the graph
fill <- c("maroon1", "lawngreen","dodgerblue")
no.of.bw.res.graph+geom_text(aes(label                                                =
paste(round((result.per.bw),2),"%"),y=pos/100,size                                    =
4),colour="black",fontface="bold")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s and
```

```
number of bowlers india played") + scale_fill_manual(values=fill)+labs(x = "number of
bowlers", y = "% of match results")

#-------------------------------------------------------------------------------------------------------
------------------------------
#How no of batsmen affect the result for india
no.of.batsmen<-unique(odidata$no.of.batsmen)
no.of.batsmen # number of batsmen india has played
# india has played 7,6,5,4 batsmen since 1 jan,2000
# affect on result when india plays 7 batsmen
#1. no of such matches
bt7<-nrow(odidata[odidata$no.of.batsmen==7,])
bt7
#2. no of matches won
bt7.won<-nrow(odidata[odidata$no.of.batsmen==7                                    &
odidata$match.result.for.india=="won",])
bt7.won
#3. no of matches lost
bt7.lost<-nrow(odidata[odidata$no.of.batsmen==7                                   &
odidata$match.result.for.india=="lost",])
bt7.lost
#3. no of matches tied
bt7.tied<-nrow(odidata[odidata$no.of.batsmen==7                                   &
odidata$match.result.for.india=="tied",])
bt7.tied
#above results in percentages
# winning %
per.bt7.won<-bt7.won/bt7*100
per.bt7.won
# loss %
per.bt7.lost<-bt7.lost/bt7*100
```

```
per.bt7.lost
# tied %
per.bt7.tied<-bt7.tied/bt7*100
per.bt7.tied

#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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++++++++++++++++++++++++++++++
# affect on result when india plays 6 batsmen
#1. no of such matches
bt6<-nrow(odidata[odidata$no.of.batsmen==6,])
bt6
#2. no of matches won
bt6.won<-nrow(odidata[odidata$no.of.batsmen==6                    &
odidata$match.result.for.india=="won",])
bt6.won
#3. no of matches lost
bt6.lost<-nrow(odidata[odidata$no.of.batsmen==6                   &
odidata$match.result.for.india=="lost",])
bt6.lost
#3. no of matches tied
bt6.tied<-nrow(odidata[odidata$no.of.batsmen==6                   &
odidata$match.result.for.india=="tied",])
bt6.tied
#above results in percentages
# winning %
per.bt6.won<-bt6.won/bt6*100
per.bt6.won
# loss %
per.bt6.lost<-bt6.lost/bt6*100
```

```
per.bt6.lost
# tied %
per.bt6.tied<-bt6.tied/bt6*100
per.bt6.tied

#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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++++++++++++++++++++++++++++++
# affect on result when india plays 5 batsmen
#1. no of such matches
bt5<-nrow(odidata[odidata$no.of.batsmen==5,])
bt5
#2. no of matches won
bt5.won<-nrow(odidata[odidata$no.of.batsmen==5                    &
odidata$match.result.for.india=="won",])
bt5.won
#3. no of matches lost
bt5.lost<-nrow(odidata[odidata$no.of.batsmen==5                   &
odidata$match.result.for.india=="lost",])
bt5.lost
#3. no of matches tied
bt5.tied<-nrow(odidata[odidata$no.of.batsmen==5                   &
odidata$match.result.for.india=="tied",])
bt5.tied
#above results in percentages
# winning %
per.bt5.won<-bt5.won/bt5*100
per.bt5.won
# loss %
per.bt5.lost<-bt5.lost/bt5*100
```

```
per.bt5.lost
# tied %
per.bt5.tied<-bt5.tied/bt5*100
per.bt5.tied

#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++
# affect on result when india plays 4 batsmen
#1. no of such matches
bt4<-nrow(odidata[odidata$no.of.batsmen==4,])
bt4
#2. no of matches won
bt4.won<-nrow(odidata[odidata$no.of.batsmen==4                    &
odidata$match.result.for.india=="won",])
bt4.won
#3. no of matches lost
bt4.lost<-nrow(odidata[odidata$no.of.batsmen==4                   &
odidata$match.result.for.india=="lost",])
bt4.lost
#3. no of matches tied
bt4.tied<-nrow(odidata[odidata$no.of.batsmen==4                   &
odidata$match.result.for.india=="tied",])
bt4.tied
#above results in percentages
# winning %
per.bt4.won<-bt4.won/bt4*100
per.bt4.won
# loss %
per.bt4.lost<-bt4.lost/bt4*100
```

```
per.bt4.lost
# tied %
per.bt4.tied<-bt4.tied/bt4*100
per.bt4.tied

#-------------------------------------------------------------------------------------------
#comparative graphical representation of batsmen and decisions
no.of.batsmen<-sort(no.of.batsmen,decreasing=TRUE)
no.of.batsmen
bt.no<-c(7,7,7,6,6,6,5,5,5,4,4,4)
bt.no
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
result.per.bt<-
c(per.bt7.won,per.bt7.lost,per.bt7.tied,per.bt6.won,per.bt6.lost,per.bt6.tied,per.bt5.won,
per.bt5.lost,per.bt5.tied,per.bt4.won,per.bt4.lost,per.bt4.tied)
result.per.bt
bt.numb.result<-data.frame(bt.no,result.type,result.per.bt)
bt.numb.result
# creating the y-position for adding labels to the bars
pp1.bt.res <- ddply(bt.numb.result, .(bt.no),transform, pos = cumsum(result.per.bt) - (0.5
* result.per.bt))
pp1.bt.res
pp1.bt.res$result.type <- factor(pp1.bt.res$result.type, levels = c("tied","lost","won"))

#creating the graph
no.of.bt.res.graph<-ggplot(pp1.bt.res,  aes(fill=result.type,  y=result.per.bt,  x=bt.no))  +
geom_bar(position="fill", stat="identity")
no.of.bt.res.graph#this is the graph
# adding the labels to the graph
```

```
fill <- c("maroon1", "lawngreen","dodgerblue")
no.of.bt.res.graph+geom_text(aes(label =
paste(round((result.per.bt),2),"%"),y=pos/100,size =
4),colour="black",fontface="bold")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s and
number of batsmen india played") + scale_fill_manual(values=fill)+labs(x = "number of
batsmen", y = "% of match results")

#-------------------------------------------------------------------------------------------------
---------
#----------------------------------IN ASIAN COUNTRIES-------------------------------------
----------------------------
# match result depending upon the number of bowlers
# 1. checking the number of bowler(s) india have played in asia since 1 jan, 2000
odidata.asia<-odidata[odidata$asian.host=="TRUE",]
odidata.asia
no.of.bowlers.asia<-unique(odidata.asia$no.of.bowlers)
no.of.bowlers.asia
# thus india have played 5,4,3 and 2 bowlers in all matches in ASIA since 1 jan, 2000
# now we'll check result of the matches in ASIA depending on the number of bowlers
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++
# when india played 5 bowlers and india won the match
#1. no of such matches when india played 5 bowlers in asia
bow5.asia<-nrow(odidata.asia[odidata.asia$no.of.bowlers==5 &
odidata.asia$asian.host=="TRUE",])
bow5.asia
#2. no of times india won
asia.bow5.won<-nrow(odidata.asia[odidata.asia$no.of.bowlers==5 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.bow5.won
```

```
#3. no of times india lost
asia.bow5.lost<-nrow(odidata.asia[odidata.asia$no.of.bowlers==5 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.bow5.lost
#4. no of times india tied the match
asia.bow5.tied<-nrow(odidata.asia[odidata.asia$no.of.bowlers==5 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.bow5.tied
# now we calculate the percentage of such instances of decision
#4. percentage won
per.asia.bow5.won<-asia.bow5.won/bow5.asia*100
per.asia.bow5.won
#5. percentage lost
per.asia.bow5.lost<-asia.bow5.lost/bow5.asia*100
per.asia.bow5.lost
#6. percentage tied
per.asia.bow5.tied<-asia.bow5.tied/bow5.asia*100
per.asia.bow5.tied
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++
# when india played 4 bowlers in asia
#1. no of such matches
bow4.asia<-nrow(odidata.asia[odidata.asia$no.of.bowlers==4 &
odidata.asia$asian.host=="TRUE",])
bow4.asia
#2. no of times india won
asia.bow4.won<-nrow(odidata.asia[odidata.asia$no.of.bowlers==4 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.bow4.won
#3. no of times india lost
```

```
asia.bow4.lost<-nrow(odidata.asia[odidata.asia$no.of.bowlers==4 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.bow4.lost
#4. no of times india tied the match
asia.bow4.tied<-nrow(odidata.asia[odidata.asia$no.of.bowlers==4 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.bow4.tied
# now we calculate the percentage of such instances of decision
#4. percentage won
per.asia.bow4.won<-asia.bow4.won/bow4.asia*100
per.asia.bow4.won
#5. percentage lost
per.asia.bow4.lost<-asia.bow4.lost/bow4.asia*100
per.asia.bow4.lost
#6. percentage tied
per.asia.bow4.tied<-asia.bow4.tied/bow4.asia*100
per.asia.bow4.tied
#-------------------------------------------------------------------------------------------------
----------------------------
# when india played 3 bowlers in asia
#1. no of such matches
bow3.asia<-nrow(odidata.asia[odidata.asia$no.of.bowlers==3 &
odidata.asia$asian.host=="TRUE",])
bow3.asia
#2. no of times india won
asia.bow3.won<-nrow(odidata.asia[odidata.asia$no.of.bowlers==3 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.bow3.won
#3. no of times india lost
asia.bow3.lost<-nrow(odidata.asia[odidata.asia$no.of.bowlers==3 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
```

```
asia.bow3.lost
#4. no of times india tied the match
asia.bow3.tied<-nrow(odidata.asia[odidata.asia$no.of.bowlers==3 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.bow3.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.asia.bow3.won<-asia.bow3.won/bow3.asia*100
per.asia.bow3.won
#6. percentage lost
per.asia.bow3.lost<-asia.bow3.lost/bow3.asia*100
per.asia.bow3.lost
#7. percentage tied
per.asia.bow3.tied<-asia.bow3.tied/bow3.asia*100
per.asia.bow3.tied
#-------------------------------------------------------------------------------------------------
----------------------------
# when india played 2 bowlers in asia
#1. no of such matches
bow2.asia<-nrow(odidata.asia[odidata.asia$no.of.bowlers==2 &
odidata.asia$asian.host=="TRUE",])
bow2.asia
#2. no of times india won
asia.bow2.won<-nrow(odidata.asia[odidata.asia$no.of.bowlers==2 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.bow2.won
#3. no of times india lost
asia.bow2.lost<-nrow(odidata.asia[odidata.asia$no.of.bowlers==2 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.bow2.lost
#4. no of times india tied the match
```

```
asia.bow2.tied<-nrow(odidata.asia[odidata.asia$no.of.bowlers==2 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.bow2.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.asia.bow2.won<-asia.bow2.won/bow2.asia*100
per.asia.bow2.won
#6. percentage lost
per.asia.bow2.lost<-asia.bow2.lost/bow2.asia*100
per.asia.bow2.lost
#7. percentage tied
per.asia.bow2.tied<-asia.bow2.tied/bow2.asia*100
per.asia.bow2.tied

#-------------------------------------------------------------------------------------------
#comparative graphical representation of bowlers in asia and match results for india
no.of.bowlers.asia<-sort(no.of.bowlers.asia,decreasing=TRUE)
no.of.bowlers.asia
bow.no.asia<-c(5,5,5,4,4,4,3,3,3,2,2,2)
bow.no.asia
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
result.value.2.asia<-
c(per.asia.bow5.won,per.asia.bow5.lost,per.asia.bow5.tied,per.asia.bow4.won,per.asia.b
ow4.lost,per.asia.bow4.tied,per.asia.bow3.won,per.asia.bow3.lost,per.asia.bow3.tied,pe
r.asia.bow2.won,per.asia.bow2.lost,per.asia.bow2.tied)
result.value.2.asia
pp1.bow.asia<-data.frame(bow.no.asia,result.type,result.value.2.asia)
pp1.bow.asia
```

```
pp1.bow.asia$result.type <- factor(pp1.bow.asia$result.type, levels = c("tied","lost","won"))
# creating the y-position for adding labels to the bars
pp1.bow.asia <- ddply(pp1.bow.asia, .(bow.no.asia),transform, pos = cumsum(result.value.2.asia) - (0.5 * result.value.2.asia))
pp1.bow.asia
#creating the graph
bw.result.asia<-ggplot(pp1.bow.asia, aes(fill=result.type, y=result.value.2.asia, x=bow.no.asia)) + geom_bar(position="fill", stat="identity")
bw.result.asia#this is the graph
# adding the labels to the graph
fill <- c("maroon1", "lawngreen","dodgerblue")
bw.result.asia+geom_text(aes(label = paste(round((result.value.2.asia),2),"%"),y=pos/100,size = 4),colour="black",fontface="bold")+theme(legend.position="top", legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s in ASIA VS no of bowlers") + scale_fill_manual(values=fill)+labs(x = "NUMBER OF BOWLERS", y = "PERCENTAGE OF MATCH RESULTS")

#-------------------------------------------------------------------------------------------
#----------------------------------IN SENA COUNTRIES-----------------------------------------
----------------------------
# match result depending upon the number of bowlers played in sena countries
# 1. checking the number of bowler(s) india have played in sena countries since 1 jan, 2000
odidata.sena<-odidata[odidata$sena.host=="TRUE",]
odidata.sena
no.of.bowlers.sena<-unique(odidata.sena$no.of.bowlers)
no.of.bowlers.sena
# thus india have played 5,4,3 and 2 bowlers in all matches in sena since 1 jan, 2000
# now we'll check result of the match in sena depending on the number of bowlers
```

```
#+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++
# when india played 5 bowlers in sena
#1. no of such matches
bow5.sena<-nrow(odidata.sena[odidata.sena$no.of.bowlers==5                    &
odidata.sena$sena.host=="TRUE",])
bow5.sena
#2. no of times india won
sena.bow5.won<-nrow(odidata.sena[odidata.sena$no.of.bowlers==5                &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.bow5.won
#3. no of times india lost
sena.bow5.lost<-nrow(odidata.sena[odidata.sena$no.of.bowlers==5               &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.bow5.lost
#4. no of times india tied the match
sena.bow5.tied<-nrow(odidata.sena[odidata.sena$no.of.bowlers==5               &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.bow5.tied
# now we calculate the percentage of such instances of decision
#4. percentage won
per.sena.bow5.won<-sena.bow5.won/bow5.sena*100
per.sena.bow5.won
#5. percentage lost
per.sena.bow5.lost<-sena.bow5.lost/bow5.sena*100
per.sena.bow5.lost
#6. percentage tied
per.sena.bow5.tied<-sena.bow5.tied/bow5.sena*100
per.sena.bow5.tied
#+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++
```

```
# when india played 4 bowlers in sena
#1. no of such matches
bow4.sena<-nrow(odidata.sena[odidata.sena$no.of.bowlers==4                    &
odidata.sena$sena.host=="TRUE",])
bow4.sena
#2. no of times india won
sena.bow4.won<-nrow(odidata.sena[odidata.sena$no.of.bowlers==4                &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.bow4.won
#3. no of times india lost
sena.bow4.lost<-nrow(odidata.sena[odidata.sena$no.of.bowlers==4               &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.bow4.lost
#4. no of times india tied the match
sena.bow4.tied<-nrow(odidata.sena[odidata.sena$no.of.bowlers==4               &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.bow4.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.bow4.won<-sena.bow4.won/bow4.sena*100
per.sena.bow4.won
#6. percentage lost
per.sena.bow4.lost<-sena.bow4.lost/bow4.sena*100
per.sena.bow4.lost
#7. percentage tied
per.sena.bow4.tied<-sena.bow4.tied/bow4.sena*100
per.sena.bow4.tied

#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++
# when india played 3 bowlers in sena
```

```
#1. no of such matches
bow3.sena<-nrow(odidata.sena[odidata.sena$no.of.bowlers==3 &
odidata.sena$sena.host=="TRUE",])
bow3.sena
#2. no of times india won
sena.bow3.won<-nrow(odidata.sena[odidata.sena$no.of.bowlers==3 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.bow3.won
#3. no of times india lost
sena.bow3.lost<-nrow(odidata.sena[odidata.sena$no.of.bowlers==3 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.bow3.lost
#4. no of times india tied the match
sena.bow3.tied<-nrow(odidata.sena[odidata.sena$no.of.bowlers==3 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.bow3.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.bow3.won<-sena.bow3.won/bow3.sena*100
per.sena.bow3.won
#6. percentage lost
per.sena.bow3.lost<-sena.bow3.lost/bow3.sena*100
per.sena.bow3.lost
#7. percentage tied
per.sena.bow3.tied<-sena.bow3.tied/bow3.sena*100
per.sena.bow3.tied

#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++
# when india played 2 bowlers in sena
#1. no of such matches
```

```
bow2.sena<-nrow(odidata.sena[odidata.sena$no.of.bowlers==2 &
odidata.sena$sena.host=="TRUE",])
bow2.sena
#2. no of times india won
sena.bow2.won<-nrow(odidata.sena[odidata.sena$no.of.bowlers==2 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.bow2.won
#3. no of times india lost
sena.bow2.lost<-nrow(odidata.sena[odidata.sena$no.of.bowlers==2 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.bow2.lost
#4. no of times india tied the match
sena.bow2.tied<-nrow(odidata.sena[odidata.sena$no.of.bowlers==2 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.bow2.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.bow2.won<-sena.bow2.won/bow2.sena*100
per.sena.bow2.won
#6. percentage lost
per.sena.bow2.lost<-sena.bow2.lost/bow2.sena*100
per.sena.bow2.lost
#7. percentage tied
per.sena.bow2.tied<-sena.bow2.tied/bow2.sena*100
per.sena.bow2.tied

#-------------------------------------------------------------------------------------
#comparative graphical representation of bowlers in sena and match results for india
no.of.bowlers.sena<-sort(no.of.bowlers.sena,decreasing=TRUE)
no.of.bowlers.sena
bow.no.sena<-c(5,5,5,4,4,4,3,3,3,2,2,2)
```

```
bow.no.sena
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
bow.result.value.2.sena<-
c(per.sena.bow5.won,per.sena.bow5.lost,per.sena.bow5.tied,per.sena.bow4.won,per.sen
a.bow4.lost,per.sena.bow4.tied,per.sena.bow3.won,per.sena.bow3.lost,per.sena.bow3.ti
ed,per.sena.bow2.won,per.sena.bow2.lost,per.sena.bow2.tied)
bow.result.value.2.sena
pp1.bow.sena<-data.frame(bow.no.sena,result.type,bow.result.value.2.sena)
pp1.bow.sena
pp1.bow.sena$result.type <- factor(pp1.bow.sena$result.type, levels =
c("tied","lost","won"))
# creating the y-position for adding labels to the bars
pp1.bow.sena <- ddply(pp1.bow.sena, .(bow.no.sena),transform, pos =
cumsum(bow.result.value.2.sena) - (0.5 * bow.result.value.2.sena))
pp1.bow.sena
#creating the graph
bw.result.sena<-ggplot(pp1.bow.sena, aes(fill=result.type, y=bow.result.value.2.sena,
x=bow.no.sena)) + geom_bar(position="fill", stat="identity")
bw.result.sena#this is the graph
# adding the labels to the graph
fill <- c("maroon1", "lawngreen","dodgerblue")
bw.result.sena+geom_text(aes(label =
paste(round((bow.result.value.2.sena),2),"%"),y=pos/100,size =
4),colour="black",fontface="bold")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s in
SENA VS no of bowlers") + scale_fill_manual(values=fill)+labs(x = "NUMBER OF
BOWLERS", y = "PERCENTAGE OF MATCH RESULTS")
```

```
#-------------------------------------------------------------------------------------------------
---------
#----------------------------------IN ASIAN COUNTRIES-------------------------------------
----------------------------
# match result depending upon the number of batsmen
# 1. checking the number of batsmen india have played in asia since 1 jan, 2000
odidata.asia<-odidata[odidata$asian.host=="TRUE",]
odidata.asia
no.of.batsmen.asia<-unique(odidata.asia$no.of.batsmen)
no.of.batsmen.asia
# thus india have played 7,6,5 and 4 batsmen in all matches in ASIA since 1 jan, 2000
# now we'll check result of the match in ASIA depending on the number of batsmen
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++
# when india played 7 batsmen in asia
#1. no of such matches
bt7.asia<-nrow(odidata.asia[odidata.asia$no.of.batsmen==7                    &
odidata.asia$asian.host=="TRUE",])
bt7.asia
#2. no of times india won
asia.bt7.won<-nrow(odidata.asia[odidata.asia$no.of.batsmen==7                &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.bt7.won
#3. no of times india lost
asia.bt7.lost<-nrow(odidata.asia[odidata.asia$no.of.batsmen==7               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.bt7.lost
#4. no of times india tied the match
asia.bt7.tied<-nrow(odidata.asia[odidata.asia$no.of.batsmen==7               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.bt7.tied
```

```
# now we calculate the percentage of such instances of decision
#5. percentage won
per.asia.bt7.won<-asia.bt7.won/bt7.asia*100
per.asia.bt7.won
#6. percentage lost
per.asia.bt7.lost<-asia.bt7.lost/bt7.asia*100
per.asia.bt7.lost
#7. percentage tied
per.asia.bt7.tied<-asia.bt7.tied/bt7.asia*100
per.asia.bt7.tied

#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++++++++
# when india played 6 batsmen in asia
#1. no of such matches
bt6.asia<-nrow(odidata.asia[odidata.asia$no.of.batsmen==6                    &
odidata.asia$asian.host=="TRUE",])
bt6.asia
#2. no of times india won
asia.bt6.won<-nrow(odidata.asia[odidata.asia$no.of.batsmen==6                &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.bt6.won
#3. no of times india lost
asia.bt6.lost<-nrow(odidata.asia[odidata.asia$no.of.batsmen==6               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.bt6.lost
#4. no of times india tied the match
asia.bt6.tied<-nrow(odidata.asia[odidata.asia$no.of.batsmen==6               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.bt6.tied
# now we calculate the percentage of such instances of decision
```

```
#5. percentage won
per.asia.bt6.won<-asia.bt6.won/bt6.asia*100
per.asia.bt6.won
#6. percentage lost
per.asia.bt6.lost<-asia.bt6.lost/bt6.asia*100
per.asia.bt6.lost
#7. percentage tied
per.asia.bt6.tied<-asia.bt6.tied/bt6.asia*100
per.asia.bt6.tied
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++++++
# when india played 5 batsmen in asia
#1. no of such matches
bt5.asia<-nrow(odidata.asia[odidata.asia$no.of.batsmen==5                    &
odidata.asia$asian.host=="TRUE",])
bt5.asia
#2. no of times india won
asia.bt5.won<-nrow(odidata.asia[odidata.asia$no.of.batsmen==5                &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.bt5.won
#3. no of times india lost
asia.bt5.lost<-nrow(odidata.asia[odidata.asia$no.of.batsmen==5               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.bt5.lost
#4. no of times india tied the match
asia.bt5.tied<-nrow(odidata.asia[odidata.asia$no.of.batsmen==5               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.bt5.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.asia.bt5.won<-asia.bt5.won/bt5.asia*100
```

```
per.asia.bt5.won
#6. percentage lost
per.asia.bt5.lost<-asia.bt5.lost/bt5.asia*100
per.asia.bt5.lost
#7. percentage tied
per.asia.bt5.tied<-asia.bt5.tied/bt5.asia*100
per.asia.bt5.tied
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++++++
# when india played 4 batsmen in asia
#1. no of such matches
bt4.asia<-nrow(odidata.asia[odidata.asia$no.of.batsmen==4                    &
odidata.asia$asian.host=="TRUE",])
bt4.asia
#2. no of times india won
asia.bt4.won<-nrow(odidata.asia[odidata.asia$no.of.batsmen==4                &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.bt4.won
#3. no of times india lost
asia.bt4.lost<-nrow(odidata.asia[odidata.asia$no.of.batsmen==4               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.bt4.lost
#4. no of times india tied the match
asia.bt4.tied<-nrow(odidata.asia[odidata.asia$no.of.batsmen==4               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.bt4.tied
# now we calculate the percentage of such instances of decision
#4. percentage won
per.asia.bt4.won<-asia.bt4.won/bt4.asia*100
per.asia.bt4.won
#6. percentage lost
```

```
per.asia.bt4.lost<-asia.bt4.lost/bt4.asia*100
per.asia.bt4.lost
#7. percentage tied
per.asia.bt4.tied<-asia.bt4.tied/bt4.asia*100
per.asia.bt4.tied
#-----------------------------------------------------------------------------------------
#comparative graphical representation of batsmen in asia and match results for india
no.of.batsmen.asia<-sort(no.of.batsmen.asia,decreasing=TRUE)
no.of.batsmen.asia
bt.no.asia<-c(7,7,7,6,6,6,5,5,5,4,4,4)
bt.no.asia
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
bt.result.value.2.asia<-
c(per.asia.bt7.won,per.asia.bt7.lost,per.asia.bt7.tied,per.asia.bt6.won,per.asia.bt6.lost,pe
r.asia.bt6.tied,per.asia.bt5.won,per.asia.bt5.lost,per.asia.bt5.tied,per.asia.bt4.won,per.asi
a.bt4.lost,per.asia.bt4.tied)
bt.result.value.2.asia
pp1.bt.asia<-data.frame(bt.no.asia,result.type,bt.result.value.2.asia)
pp1.bt.asia
pp1.bt.asia$result.type <- factor(pp1.bt.asia$result.type, levels = c("tied","lost","won"))
# creating the y-position for adding labels to the bars
pp1.bt.asia <- ddply(pp1.bt.asia, .(bt.no.asia),transform, pos =
cumsum(bt.result.value.2.asia) - (0.5 * bt.result.value.2.asia))
pp1.bt.asia
#creating the graph
bt.result.asia<-ggplot(pp1.bt.asia, aes(fill=result.type, y=bt.result.value.2.asia,
x=bt.no.asia)) + geom_bar(position="fill", stat="identity")
bt.result.asia#this is the graph
# adding the labels to the graph
```

```
fill <- c("maroon1", "lawngreen","dodgerblue")
bt.result.asia+geom_text(aes(label =
paste(round((bt.result.value.2.asia),2),"%"),y=pos/100,size =
4),colour="black",fontface="bold")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s in
ASIA VS no of batsmen") + scale_fill_manual(values=fill)+labs(x = "NUMBER OF
BATSMEN", y = "PERCENTAGE OF MATCH RESULTS")
#-----------------------------------------------------------------------------------------------
---------
#----------------------------------IN SENA COUNTRIES-------------------------------------
---------------------------
# match result depending upon the number of batsmen
# 1. checking the number of batsmen(s) india have played in SENA since 1 jan, 2000
odidata.sena<-odidata[odidata$sena.host=="TRUE",]
odidata.sena
no.of.batsmen.sena<-unique(odidata.asia$no.of.batsmen)
no.of.batsmen.sena
# thus india have played 7,6,5 and 4 batsmen in all matches in SENA since 1 jan, 2000
# now we'll check result of the match in SENA depending on the number of batsmen
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++
# when india played 5 batsmen and india won the match
#1. no of such matches
# thus india have played 7,6,5 and 4batsmen in matches in SENA since 1 jan, 2000
# now we'll check result of the match depending on the number of batsmen
# when india played 7 batsmen in SENA
#1. no of such matches
bt7.sena<-nrow(odidata.sena[odidata.sena$no.of.batsmen==7 &
odidata.sena$sena.host=="TRUE",])
bt7.sena
#2. no of times india won
```

```
sena.bt7.won<-nrow(odidata.sena[odidata.sena$no.of.batsmen==7 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.bt7.won
#3. no of times india lost
sena.bt7.lost<-nrow(odidata.sena[odidata.sena$no.of.batsmen==7 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.bt7.lost
#4. no of times india tied the match
sena.bt7.tied<-nrow(odidata.sena[odidata.sena$no.of.batsmen==7 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.bt7.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.bt7.won<-sena.bt7.won/bt7.sena*100
per.sena.bt7.won
#6. percentage lost
per.sena.bt7.lost<-sena.bt7.lost/bt7.sena*100
per.sena.bt7.lost
#7. percentage tied
per.sena.bt7.tied<-sena.bt7.tied/bt7.sena*100
per.sena.bt7.tied
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++
#1. no of such matches
bt6.sena<-nrow(odidata.sena[odidata.sena$no.of.batsmen==6 &
odidata.sena$sena.host=="TRUE",])
bt6.sena
#2. no of times india won
sena.bt6.won<-nrow(odidata.sena[odidata.sena$no.of.batsmen==6 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.bt6.won
```

```
#3. no of times india lost
sena.bt6.lost<-nrow(odidata.sena[odidata.sena$no.of.batsmen==6 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.bt6.lost
#4. no of times india tied the match
sena.bt6.tied<-nrow(odidata.sena[odidata.sena$no.of.batsmen==6 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.bt6.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.bt6.won<-sena.bt6.won/bt6.sena*100
per.sena.bt6.won
#6. percentage lost
per.sena.bt6.lost<-sena.bt6.lost/bt6.sena*100
per.sena.bt6.lost
#7. percentage tied
per.sena.bt6.tied<-sena.bt6.tied/bt6.sena*100
per.sena.bt6.tied
#---------------------------------------------------------------------------
#1. no of such matches
bt5.sena<-nrow(odidata.sena[odidata.sena$no.of.batsmen==5 &
odidata.sena$sena.host=="TRUE",])
bt5.sena
#2. no of times india won
sena.bt5.won<-nrow(odidata.sena[odidata.sena$no.of.batsmen==5 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.bt5.won
#3. no of times india lost
sena.bt5.lost<-nrow(odidata.sena[odidata.sena$no.of.batsmen==5 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.bt5.lost
```

```
#4. no of times india tied the match
sena.bt5.tied<-nrow(odidata.sena[odidata.sena$no.of.batsmen==5 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.bt5.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.bt5.won<-sena.bt5.won/bt5.sena*100
per.sena.bt5.won
#6. percentage lost
per.sena.bt5.lost<-sena.bt5.lost/bt5.sena*100
per.sena.bt5.lost
#7. percentage tied
per.sena.bt5.tied<-sena.bt5.tied/bt5.sena*100
per.sena.bt5.tied
#-------------------------------------------------------------------------------
#1. no of such matches
bt4.sena<-nrow(odidata.sena[odidata.sena$no.of.batsmen==4 &
odidata.sena$sena.host=="TRUE",])
bt4.sena
#2. no of times india won
sena.bt4.won<-nrow(odidata.sena[odidata.sena$no.of.batsmen==4 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.bt4.won
#3. no of times india lost
sena.bt4.lost<-nrow(odidata.sena[odidata.sena$no.of.batsmen==4 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.bt4.lost
#4. no of times india tied the match
sena.bt4.tied<-nrow(odidata.sena[odidata.sena$no.of.batsmen==4 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.bt4.tied
```

```
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.bt4.won<-sena.bt4.won/bt4.sena*100
per.sena.bt4.won
#6. percentage lost
per.sena.bt4.lost<-sena.bt4.lost/bt4.sena*100
per.sena.bt4.lost
#7. percentage tied
per.sena.bt4.tied<-sena.bt4.tied/bt4.sena*100
per.sena.bt4.tied
#-----------------------------------------------------------------------------------------
#comparative graphical representation of batsmen in sena and match results for india
no.of.batsmen.sena<-sort(no.of.batsmen.sena,decreasing=TRUE)
no.of.batsmen.sena
bt.no.sena<-c(7,7,7,6,6,6,5,5,5,4,4,4)
bt.no.sena
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
bt.result.value.2.sena<-
c(per.sena.bt7.won,per.sena.bt7.lost,per.sena.bt7.tied,per.sena.bt6.won,per.sena.bt6.lost
,per.sena.bt6.tied,per.sena.bt5.won,per.sena.bt5.lost,per.sena.bt5.tied,per.sena.bt4.won,
per.sena.bt4.lost,per.sena.bt4.tied)
bt.result.value.2.sena
pp1.bt.sena<-data.frame(bt.no.sena,result.type,bt.result.value.2.sena)
pp1.bt.sena
pp1.bt.sena$result.type <- factor(pp1.bt.sena$result.type, levels = c("tied","lost","won"))
# creating the y-position for adding labels to the bars
pp1.bt.sena <- ddply(pp1.bt.sena, .(bt.no.sena),transform, pos =
cumsum(bt.result.value.2.sena) - (0.5 * bt.result.value.2.sena))
pp1.bt.sena
```

```
#creating the graph
bt.result.sena<-ggplot(pp1.bt.sena, aes(fill=result.type, y=bt.result.value.2.sena,
x=bt.no.sena)) + geom_bar(position="fill", stat="identity")
bt.result.sena#this is the graph
# adding the labels to the graph
fill <- c("seagreen3", "orange1","dodgerblue2")
bt.result.sena+geom_text(aes(label =
paste(round((bt.result.value.2.sena),2),"%"),y=pos/100,size =
4),colour="black",fontface="bold")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s in
SENA VS no of batsmen") + scale_fill_manual(values=fill)+labs(x = "NUMBER OF
BATSMEN", y = "PERCENTAGE OF MATCH RESULTS")


#-------------------------------------------------------------------------------------------------
--------------------------------
#How no of allrounders affect the result for india
total.allrounders<-unique(odidata$total.allrounders)
total.allrounders # number of allrounders india has played
# india has played 2,1,3 and 0 allrounders since 1 jan,2000
# affect on result when india plays 3 allrounders
#1. no of such matches
ar3<-nrow(odidata[odidata$total.allrounders==3,])
ar3
#2. no of matches won
ar3.won<-nrow(odidata[odidata$total.allrounders==3 &
odidata$match.result.for.india=="won",])
ar3.won
#3. no of matches lost
ar3.lost<-nrow(odidata[odidata$total.allrounders==3 &
odidata$match.result.for.india=="lost",])
```

```
ar3.lost
#4. no of matches tied
ar3.tied<-nrow(odidata[odidata$total.allrounders==3 &
odidata$match.result.for.india=="tied",])
ar3.tied
#above results in percentages
# winning %
per.ar3.won<-ar3.won/ar3*100
per.ar3.won
# loss %
per.ar3.lost<-ar3.lost/ar3*100
per.ar3.lost
# tied %
per.ar3.tied<-ar3.tied/ar3*100
per.ar3.tied
# affect on result when india plays 2 allrounders
#1. no of such matches
ar2<-nrow(odidata[odidata$total.allrounders==2,])
ar2
#2. no of matches won
ar2.won<-nrow(odidata[odidata$total.allrounders==2 &
odidata$match.result.for.india=="won",])
ar2.won
#3. no of matches lost
ar2.lost<-nrow(odidata[odidata$total.allrounders==2 &
odidata$match.result.for.india=="lost",])
ar2.lost
#4. no of matches tied
ar2.tied<-nrow(odidata[odidata$total.allrounders==2 &
odidata$match.result.for.india=="tied",])
ar2.tied
```

```
#above results in percentages
# winning %
per.ar2.won<-ar2.won/ar2*100
per.ar2.won
# loss %
per.ar2.lost<-ar2.lost/ar2*100
per.ar2.lost
# tied %
per.ar2.tied<-ar2.tied/ar2*100
per.ar2.tied
# affect on result when india plays 1 allrounders
#1. no of such matches
ar1<-nrow(odidata[odidata$total.allrounders==1,])
ar1
#2. no of matches won
ar1.won<-nrow(odidata[odidata$total.allrounders==1                    &
odidata$match.result.for.india=="won",])
ar1.won
#3. no of matches lost
ar1.lost<-nrow(odidata[odidata$total.allrounders==1                   &
odidata$match.result.for.india=="lost",])
ar1.lost
#4. no of matches tied
ar1.tied<-nrow(odidata[odidata$total.allrounders==1                   &
odidata$match.result.for.india=="tied",])
ar1.tied
#above results in percentages
# winning %
per.ar1.won<-ar1.won/ar1*100
per.ar1.won
# loss %
```

```
per.ar1.lost<-ar1.lost/ar1*100
per.ar1.lost
# tied %
per.ar1.tied<-ar1.tied/ar1*100
per.ar1.tied

# affect on result when india plays 0 allrounders
#1. no of such matches
ar0<-nrow(odidata[odidata$total.allrounders==0,])
ar0
#2. no of matches won
ar0.won<-nrow(odidata[odidata$total.allrounders==0                    &
odidata$match.result.for.india=="won",])
ar0.won
#3. no of matches lost
ar0.lost<-nrow(odidata[odidata$total.allrounders==0                   &
odidata$match.result.for.india=="lost",])
ar0.lost
#4. no of matches tied
ar0.tied<-nrow(odidata[odidata$total.allrounders==0                   &
odidata$match.result.for.india=="tied",])
ar0.tied
#above results in percentages
# winning %
per.ar0.won<-ar0.won/ar0*100
per.ar0.won
# loss %
per.ar0.lost<-ar0.lost/ar0*100
per.ar0.lost
# tied %
per.ar0.tied<-ar0.tied/ar0*100
```

```
per.ar0.tied

#-------------------------------------------------------------------------------------------
#comparative graphical representation of allrounders and decisions
no.of.allrounders<-sort(no.of.allrounders,decreasing=TRUE)
no.of.allrounders
ar.no<-c(3,3,3,2,2,2,1,1,1,0,0,0)
ar.no
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
result.per.ar<-
c(per.ar3.won,per.ar3.lost,per.ar3.tied,per.ar2.won,per.ar2.lost,per.ar2.tied,per.ar1.won,
per.ar1.lost,per.ar1.tied,per.ar0.won,per.ar0.lost,per.ar0.tied)
result.per.ar
ar.numb.result<-data.frame(ar.no,result.type,result.per.ar)
ar.numb.result
# creating the y-position for adding labels to the bars
pp1.ar.res <- ddply(ar.numb.result, .(ar.no),transform, pos = cumsum(result.per.ar) - (0.5
* result.per.ar))
pp1.ar.res
pp1.ar.res$result.type <- factor(pp1.ar.res$result.type, levels = c("tied","lost","won"))

#creating the graph
no.of.ar.res.graph<-ggplot(pp1.ar.res,  aes(fill=result.type,  y=result.per.ar,  x=ar.no))  +
geom_bar(position="fill", stat="identity")
no.of.ar.res.graph#this is the graph
# adding the labels to the graph
fill <- c("gold1", "turquoise3","deeppink")
no.of.ar.res.graph+geom_text(aes(label                                                    =
paste(round((result.per.ar),2),"%"),y=pos/100,size                                        =
```

```
4),colour="black",fontface="bold")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s and
number of allrounders india played") + scale_fill_manual(values=fill)+labs(x = "number
of allrounders", y = "% of match results")
#-------------------------------------------------------------------------------------------------
---------
#----------------------------------IN ASIAN COUNTRIES-------------------------------------
-----------------------------
# match result depending upon the number of allrounders
# 1. checking the number of allrounders(s) india have played in asia since 1 jan, 2000
odidata.asia<-odidata[odidata$asian.host=="TRUE",]
odidata.asia
total.allrounders.asia<-unique(odidata.asia$total.allrounders)
total.allrounders.asia
# thus india have played 3,2,1,0 allrounders in all matches in ASIA since 1 jan, 2000
# now we'll check result of the match in ASIA depending on the number of allrounders
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++
# when india played 3 allrounders and india won the match
#1. no of such matches
ar3.asia<-nrow(odidata.asia[odidata.asia$total.allrounders==3                    &
odidata.asia$asian.host=="TRUE",])
ar3.asia
#2. no of times india won
asia.ar3.won<-nrow(odidata.asia[odidata.asia$total.allrounders==3                &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.ar3.won
#3. no of times india lost
asia.ar3.lost<-nrow(odidata.asia[odidata.asia$total.allrounders==3               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.ar3.lost
```

```
#4. no of times india tied the match
asia.ar3.tied<-nrow(odidata.asia[odidata.asia$total.allrounders==3 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.ar3.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.asia.ar3.won<-asia.ar3.won/ar3.asia*100
per.asia.ar3.won
#6. percentage lost
per.asia.ar3.lost<-asia.ar3.lost/ar3.asia*100
per.asia.ar3.lost
#7. percentage tied
per.asia.ar3.tied<-asia.ar3.tied/ar3.asia*100
per.asia.ar3.tied

# when india played 2 allrounders and india won the match
#1. no of such matches
ar2.asia<-nrow(odidata.asia[odidata.asia$total.allrounders==2 &
odidata.asia$asian.host=="TRUE",])
ar2.asia
#2. no of times india won
asia.ar2.won<-nrow(odidata.asia[odidata.asia$total.allrounders==2 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.ar2.won
#3. no of times india lost
asia.ar2.lost<-nrow(odidata.asia[odidata.asia$total.allrounders==2 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.ar2.lost
#4. no of times india tied the match
asia.ar2.tied<-nrow(odidata.asia[odidata.asia$total.allrounders==2 &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
```

```
asia.ar2.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.asia.ar2.won<-asia.ar2.won/ar2.asia*100
per.asia.ar2.won
#6. percentage lost
per.asia.ar2.lost<-asia.ar2.lost/ar2.asia*100
per.asia.ar2.lost
#7. percentage tied
per.asia.ar2.tied<-asia.ar2.tied/ar2.asia*100
per.asia.ar2.tied

# when india played 1 allrounders and india won the match
#1. no of such matches
ar1.asia<-nrow(odidata.asia[odidata.asia$total.allrounders==1                    &
odidata.asia$asian.host=="TRUE",])
ar1.asia
#2. no of times india won
asia.ar1.won<-nrow(odidata.asia[odidata.asia$total.allrounders==1                &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.ar1.won
#3. no of times india lost
asia.ar1.lost<-nrow(odidata.asia[odidata.asia$total.allrounders==1               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.ar1.lost
#4. no of times india tied the match
asia.ar1.tied<-nrow(odidata.asia[odidata.asia$total.allrounders==1               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.ar1.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
```

```
per.asia.ar1.won<-asia.ar1.won/ar1.asia*100
per.asia.ar1.won
#6. percentage lost
per.asia.ar1.lost<-asia.ar1.lost/ar1.asia*100
per.asia.ar1.lost
#7. percentage tied
per.asia.ar1.tied<-asia.ar1.tied/ar1.asia*100
per.asia.ar1.tied

# when india played 0 allrounders and india won the match
#1. no of such matches
ar0.asia<-nrow(odidata.asia[odidata.asia$total.allrounders==0                    &
odidata.asia$asian.host=="TRUE",])
ar0.asia
#2. no of times india won
asia.ar0.won<-nrow(odidata.asia[odidata.asia$total.allrounders==0                &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="won",])
asia.ar0.won
#3. no of times india lost
asia.ar0.lost<-nrow(odidata.asia[odidata.asia$total.allrounders==0               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="lost",])
asia.ar0.lost
#4. no of times india tied the match
asia.ar0.tied<-nrow(odidata.asia[odidata.asia$total.allrounders==0               &
odidata.asia$asian.host=="TRUE" & odidata.asia$match.result.for.india=="tied",])
asia.ar0.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.asia.ar0.won<-asia.ar0.won/ar0.asia*100
per.asia.ar0.won
#6. percentage lost
```

```
per.asia.ar0.lost<-asia.ar0.lost/ar0.asia*100
per.asia.ar0.lost
#7. percentage tied
per.asia.ar0.tied<-asia.ar0.tied/ar0.asia*100
per.asia.ar0.tied

#-------------------------------------------------------------------------------------------
#comparative graphical representation of allrounders in asia and match results for india
no.of.allrounders<-sort(no.of.allrounders,decreasing=TRUE)
no.of.allrounders
ar.no<-c(3,3,3,2,2,2,1,1,1,0,0,0)
ar.no
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
ar.result.value.2.asia<-
c(per.asia.ar3.won,per.asia.ar3.lost,per.asia.ar3.tied,per.asia.ar2.won,per.asia.ar2.lost,pe
r.asia.ar2.tied,per.asia.ar1.won,per.asia.ar1.lost,per.asia.ar1.tied,per.asia.ar0.won,per.asi
a.ar0.lost,per.asia.ar0.tied)
ar.result.value.2.asia
pp1.ar.asia<-data.frame(ar.no,result.type,ar.result.value.2.asia)
pp1.ar.asia
pp1.ar.asia$result.type <- factor(pp1.ar.asia$result.type, levels = c("tied","lost","won"))
# creating the y-position for adding labels to the bars
pp1.ar.asia <- ddply(pp1.ar.asia, .(ar.no),transform, pos = cumsum(ar.result.value.2.asia)
- (0.5 * ar.result.value.2.asia))
pp1.ar.asia
#creating the graph
ar.result.asia<-ggplot(pp1.ar.asia, aes(fill=result.type, y=ar.result.value.2.asia, x=ar.no))
+ geom_bar(position="fill", stat="identity")
ar.result.asia#this is the graph
```

```
# adding the labels to the graph
fill <- c("seagreen3", "orange1","dodgerblue2")
ar.result.asia+geom_text(aes(label =
paste(round((ar.result.value.2.asia),2),"%"),y=pos/100,size =
4),colour="black",fontface="bold")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s in
ASIA VS no of allrounders") + scale_fill_manual(values=fill)+labs(x = "NUMBER OF
ALLROUNDERS", y = "PERCENTAGE OF MATCH RESULTS")

#----------------------------------IN SENA COUNTRIES-----------------------------------
----------------------------
# match result depending upon the number of allrounders
# 1. checking the number of allrounders(s) india have played in sena since 1 jan, 2000
odidata.sena<-odidata[odidata$sena.host=="TRUE",]
odidata.sena
total.allrounders.sena<-unique(odidata.sena$total.allrounders)
total.allrounders.sena
# thus india have played 3,2,1,0 allrounders in all matches in SENA since 1 jan, 2000
# now we'll check result of the match in SENA depending on the number of allrounders
#++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++++
# when india played 3 allrounders and india won the match
#1. no of such matches
ar3.sena<-nrow(odidata.sena[odidata.sena$total.allrounders==3 &
odidata.sena$sena.host=="TRUE",])
ar3.sena
#2. no of times india won
sena.ar3.won<-nrow(odidata.sena[odidata.sena$total.allrounders==3 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.ar3.won
#3. no of times india lost
```

```
sena.ar3.lost<-nrow(odidata.sena[odidata.sena$total.allrounders==3 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.ar3.lost
#4. no of times india tied the match
sena.ar3.tied<-nrow(odidata.sena[odidata.sena$total.allrounders==3 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.ar3.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.ar3.won<-sena.ar3.won/ar3.sena*100
per.sena.ar3.won
#6. percentage lost
per.sena.ar3.lost<-sena.ar3.lost/ar3.sena*100
per.sena.ar3.lost
#7. percentage tied
per.sena.ar3.tied<-sena.ar3.tied/ar3.sena*100
per.sena.ar3.tied

# when india played 2 allrounders and india won the match
#1. no of such matches
ar2.sena<-nrow(odidata.sena[odidata.sena$total.allrounders==2 &
odidata.sena$sena.host=="TRUE",])
ar2.sena
#2. no of times india won
sena.ar2.won<-nrow(odidata.sena[odidata.sena$total.allrounders==2 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.ar2.won
#3. no of times india lost
sena.ar2.lost<-nrow(odidata.sena[odidata.sena$total.allrounders==2 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.ar2.lost
```

```
#4. no of times india tied the match
sena.ar2.tied<-nrow(odidata.sena[odidata.sena$total.allrounders==2 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.ar2.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.ar2.won<-sena.ar2.won/ar2.sena*100
per.sena.ar2.won
#6. percentage lost
per.sena.ar2.lost<-sena.ar2.lost/ar2.sena*100
per.sena.ar2.lost
#7. percentage tied
per.sena.ar2.tied<-sena.ar2.tied/ar2.sena*100
per.sena.ar2.tied

# when india played 1 allrounders and india won the match
#1. no of such matches
ar1.sena<-nrow(odidata.sena[odidata.sena$total.allrounders==1 &
odidata.sena$sena.host=="TRUE",])
ar1.sena
#2. no of times india won
sena.ar1.won<-nrow(odidata.sena[odidata.sena$total.allrounders==1 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.ar1.won
#3. no of times india lost
sena.ar1.lost<-nrow(odidata.sena[odidata.sena$total.allrounders==1 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.ar1.lost
#4. no of times india tied the match
sena.ar1.tied<-nrow(odidata.sena[odidata.sena$total.allrounders==1 &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
```

```
sena.ar1.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
per.sena.ar1.won<-sena.ar1.won/ar1.sena*100
per.sena.ar1.won
#6. percentage lost
per.sena.ar1.lost<-sena.ar1.lost/ar1.sena*100
per.sena.ar1.lost
#7. percentage tied
per.sena.ar1.tied<-sena.ar1.tied/ar1.sena*100
per.sena.ar1.tied

# when india played 0 allrounders and india won the match
#1. no of such matches
ar0.sena<-nrow(odidata.sena[odidata.sena$total.allrounders==0                    &
odidata.sena$sena.host=="TRUE",])
ar0.sena
#2. no of times india won
sena.ar0.won<-nrow(odidata.sena[odidata.sena$total.allrounders==0                &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="won",])
sena.ar0.won
#3. no of times india lost
sena.ar0.lost<-nrow(odidata.sena[odidata.sena$total.allrounders==0               &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="lost",])
sena.ar0.lost
#4. no of times india tied the match
sena.ar0.tied<-nrow(odidata.sena[odidata.sena$total.allrounders==0               &
odidata.sena$sena.host=="TRUE" & odidata.sena$match.result.for.india=="tied",])
sena.ar0.tied
# now we calculate the percentage of such instances of decision
#5. percentage won
```

```
per.sena.ar0.won<-sena.ar0.won/ar0.sena*100
per.sena.ar0.won
#6. percentage lost
per.sena.ar0.lost<-sena.ar0.lost/ar0.sena*100
per.sena.ar0.lost
#7. percentage tied
per.sena.ar0.tied<-sena.ar0.tied/ar0.sena*100
per.sena.ar0.tied

#-----------------------------------------------------------------------------------------
#comparative graphical representation of allrounders in sena and match results for india
no.of.allrounders<-sort(no.of.allrounders,decreasing=TRUE)
no.of.allrounders
ar.no<-c(3,3,3,2,2,2,1,1,1,0,0,0)
ar.no
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
ar.result.value.2.sena<-
c(per.sena.ar3.won,per.sena.ar3.lost,per.sena.ar3.tied,per.sena.ar2.won,per.sena.ar2.lost
,per.sena.ar2.tied,per.sena.ar1.won,per.sena.ar1.lost,per.sena.ar1.tied,per.sena.ar0.won,
per.sena.ar0.lost,per.sena.ar0.tied)
ar.result.value.2.sena
pp1.ar.sena<-data.frame(ar.no,result.type,ar.result.value.2.sena)
pp1.ar.sena
pp1.ar.sena$result.type <- factor(pp1.ar.sena$result.type, levels = c("tied","lost","won"))
# creating the y-position for adding labels to the bars
pp1.ar.sena <- ddply(pp1.ar.sena, .(ar.no),transform, pos =
cumsum(ar.result.value.2.sena) - (0.5 * ar.result.value.2.sena))
pp1.ar.sena
#creating the graph
```

```
ar.result.sena<-ggplot(pp1.ar.sena, aes(fill=result.type, y=ar.result.value.2.sena, x=ar.no)) + geom_bar(position="fill", stat="identity")
ar.result.sena#this is the graph
# adding the labels to the graph
fill <- c("seagreen3", "orange1","dodgerblue2")
ar.result.sena+geom_text(aes(label = paste(round((ar.result.value.2.sena),2),"%"),y=pos/100,size = 4),colour="black",fontface="bold")+theme(legend.position="top", legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s in SENA VS no of allrounders") + scale_fill_manual(values=fill)+labs(x = "NUMBER OF ALLROUNDERS", y = "PERCENTAGE OF MATCH RESULTS")

#------------------------------------------------------------------------
#5.How no of bowlers affect the score/wickets of the opposition
# no of bowlers
no.of.bowlers<-sort(no.of.bowlers,decreasing=TRUE)
no.of.bowlers
# average wickets of opposition (we take only opposition batting)
# (1st instances bcz opposition score batting 2nd is limited)
#(by  indian teams score)
# bowlers=5
wkts.avg.bow5<-mean(odidata[odidata$no.of.bowlers==5 & odidata$batting.turn=="2nd","opposition.wickets.lost"])
wkts.avg.bow5
# bowlers=4
wkts.avg.bow4<-mean(odidata[odidata$no.of.bowlers==4 & odidata$batting.turn=="2nd","opposition.wickets.lost"])
wkts.avg.bow4
# bowlers=3
wkts.avg.bow3<-mean(odidata[odidata$no.of.bowlers==3 & odidata$batting.turn=="2nd","opposition.wickets.lost"])
```

```
wkts.avg.bow3
# bowlers=2
wkts.avg.bow2<-mean(odidata[odidata$no.of.bowlers==2                    &
odidata$batting.turn=="2nd","opposition.wickets.lost"])
wkts.avg.bow2

# average runs of opposition (we take only opposition batting)
# (1st instances bcz opposition score batting 2nd is limited)
#(by  indian teams score)
# bowlers=5
runs.avg.bow5<-mean(odidata[odidata$no.of.bowlers==5                    &
odidata$batting.turn=="2nd","opposition.runs"])
runs.avg.bow5
# bowlers=4
runs.avg.bow4<-mean(odidata[odidata$no.of.bowlers==4                    &
odidata$batting.turn=="2nd","opposition.runs"])
runs.avg.bow4
# bowlers=3
runs.avg.bow3<-mean(odidata[odidata$no.of.bowlers==3                    &
odidata$batting.turn=="2nd","opposition.runs"])
runs.avg.bow3
# bowlers=2
runs.avg.bow2<-mean(odidata[odidata$no.of.bowlers==2                    &
odidata$batting.turn=="2nd","opposition.runs"])
runs.avg.bow2
#-------------------------------------------------------------------------------------
#comparative graphical representation of opposition
#depending on no of indian bowlers playing the match
wicket.opp<-c(wkts.avg.bow5,wkts.avg.bow4,wkts.avg.bow3,wkts.avg.bow2)
wicket.opp
runs.opp<-c(runs.avg.bow5,runs.avg.bow4,runs.avg.bow3,runs.avg.bow2)
```

```
runs.opp
no.indian.bowlers<-c("5","4","3","2")
no.indian.bowlers
opp.scorecard<-data.frame(no.indian.bowlers,runs.opp,wicket.opp)
opp.scorecard
opp.score.graph<-ggplot(opp.scorecard, aes(x = wicket.opp, y = runs.opp))
+geom_point(aes(color = factor(no.indian.bowlers)),shape=16,size=5)+labs(title = "no
of indian bowlers & opposition score")+labs(x = "average opposition wickets to fall",y
= "average opposition runs",color = "no of IND bowlers playing",title = "NO OF IND
BOWLERS PLAYING VS OPPOSITION SCORE",caption = "when opp. bats
1st")+scale_x_continuous(breaks = seq(5, 10, by = 1)) +scale_y_continuous(breaks =
seq(150,350, by = 1))+theme_dark()+geom_text(aes(label=no.indian.bowlers),hjust=0,
vjust=0)
opp.score.graph
#-------------------------------------------------------------------------
#How no of batsmen affect the score/wickets of the indian team when they bat 1st
# no of batsmen
no.of.batsmen<-sort(no.of.batsmen,decreasing=TRUE)
no.of.batsmen
# average wickets of indian team (we take only indian team batting)
# (1st instances bcz indian team score batting 2nd is limited)
#(by  opposition teams score)
# batsmen=7
wkts.avg.bat7<-mean(odidata[odidata$no.of.batsmen==7                    &
odidata$batting.turn=="1st","india.wickets.lost"])
wkts.avg.bat7
# batsmen=6
wkts.avg.bat6<-mean(odidata[odidata$no.of.batsmen==6                    &
odidata$batting.turn=="1st","india.wickets.lost"])
wkts.avg.bat6
# batsmen=5
```

```
wkts.avg.bat5<-mean(odidata[odidata$no.of.batsmen==5 &
odidata$batting.turn=="1st","india.wickets.lost"])
wkts.avg.bat5
# batsmen=4
wkts.avg.bat4<-mean(odidata[odidata$no.of.batsmen==4 &
odidata$batting.turn=="1st","india.wickets.lost"])
wkts.avg.bat4

# average runs of india (we take only india batting)
# (1st instances bcz india score batting 1st is limited)
#(by  opposition teams score)
# batsmen=7
runs.avg.bat7<-mean(odidata[odidata$no.of.batsmen==7 &
odidata$batting.turn=="1st","india.runs"])
runs.avg.bat7
# batsmen=6
runs.avg.bat6<-mean(odidata[odidata$no.of.batsmen==6 &
odidata$batting.turn=="1st","india.runs"])
runs.avg.bat6
# batsmen=5
runs.avg.bat5<-mean(odidata[odidata$no.of.batsmen==5 &
odidata$batting.turn=="1st","india.runs"])
runs.avg.bat5
# batsmen=4
runs.avg.bat4<-mean(odidata[odidata$no.of.batsmen==4 &
odidata$batting.turn=="1st","india.runs"])
runs.avg.bat4

#-------------------------------------------------------------------------------------
#comparative graphical representation of opposition
#depending on no of indian batsmen playing the match
```

```
wicket.ind<-c(wkts.avg.bat7,wkts.avg.bat6,wkts.avg.bat5,wkts.avg.bat4)
wicket.ind
runs.ind<-c(runs.avg.bat7,runs.avg.bat6,runs.avg.bat5,runs.avg.bat4)
runs.ind
no.indian.batsmen<-c("7","6","5","4")
no.indian.batsmen
ind.scorecard<-data.frame(no.indian.batsmen,runs.ind,wicket.ind)
ind.scorecard
ind.score.graph<-ggplot(ind.scorecard, aes(x = wicket.ind, y = runs.ind))
+geom_point(aes(color = factor(no.indian.batsmen)),shape=16,size=5)+labs(title = "no
of indian batsmen & indian score")+labs(x = "average indian wickets to fall",y = "average
indian runs",color = "no of IND batsmen playing",title = "NO OF IND BATSMEN
PLAYING VS INDIAN SCORE",caption = "when INDIA bats
1st")+scale_x_continuous(breaks = seq(5, 10, by = 1)) +scale_y_continuous(breaks =
seq(150,350, by = 1))+theme_dark()+geom_text(aes(label=no.indian.batsmen),hjust=0,
vjust=0)
ind.score.graph

#------------------------------------------------------------------------
#How no of allrounders affect the score/wickets of the indian team
# no of batsmen
no.of.allrounders<-sort(no.of.allrounders,decreasing=TRUE)
no.of.allrounders
# average wickets of indian team (we take only indian team batting)
# (1st instances bcz indian team score batting 2nd is limited)
#(by  opposition teams score)
# allrounders=3
wkts.avg.ar3<-mean(odidata[odidata$total.allrounders==3                    &
odidata$batting.turn=="1st","india.wickets.lost"])
wkts.avg.ar3
# allrounders=2
```

```
wkts.avg.ar2<-mean(odidata[odidata$total.allrounders==2 &
odidata$batting.turn=="1st","india.wickets.lost"])
wkts.avg.ar2
# allrounders=1
wkts.avg.ar1<-mean(odidata[odidata$total.allrounders==1 &
odidata$batting.turn=="1st","india.wickets.lost"])
wkts.avg.ar1
# allrounders=0
wkts.avg.ar0<-mean(odidata[odidata$total.allrounders==0 &
odidata$batting.turn=="1st","india.wickets.lost"])
wkts.avg.ar0

# average runs of indian team (we take only indian team batting)
# (1st instances bcz indian team score batting 2nd is limited)
#(by  opposition teams score)
# allrounders=3
runs.avg.ar3<-mean(odidata[odidata$total.allrounders==3 &
odidata$batting.turn=="1st","india.runs"])
runs.avg.ar3
# allrounders=2
runs.avg.ar2<-mean(odidata[odidata$total.allrounders==2 &
odidata$batting.turn=="1st","india.runs"])
runs.avg.ar2
# allrounders=1
runs.avg.ar1<-mean(odidata[odidata$total.allrounders==1 &
odidata$batting.turn=="1st","india.runs"])
runs.avg.ar1
# allrounders=0
runs.avg.ar0<-mean(odidata[odidata$total.allrounders==0 &
odidata$batting.turn=="1st","india.runs"])
runs.avg.ar0
```

```
#-----------------------------------------------------------------------------------------
#comparative graphical representation of indian score
#depending on no of indian allrounders playing the match
wicket.ind.ar<-c(wkts.avg.ar3,wkts.avg.ar2,wkts.avg.ar1,wkts.avg.ar0)
wicket.ind.ar
runs.ind.ar<-c(runs.avg.ar3,runs.avg.ar2,runs.avg.ar1,runs.avg.ar0)
runs.ind.ar
no.indian.allrounders<-c("3","2","1","0")
no.indian.allrounders
ind.scorecard.ar<-data.frame(no.indian.allrounders,runs.ind.ar,wicket.ind.ar)
ind.scorecard.ar
ind.score.graph.ar<-ggplot(ind.scorecard.ar, aes(x = wicket.ind.ar, y = runs.ind.ar))
+geom_point(aes(color = factor(no.indian.allrounders)),shape=16,size=5)+labs(title =
"no of indian allrounders & indian score")+labs(x = "average indian wickets to fall",y =
"average indian runs",color = "no of IND allrounders playing",title = "NO OF IND
ALLROUNDERS PLAYING VS INDIAN SCORE",caption = "when INDIA bats
1st")+scale_x_continuous(breaks = seq(5, 10, by = 1)) +scale_y_continuous(breaks =
seq(150,350, by =
1))+theme_dark()+geom_text(aes(label=no.indian.allrounders),hjust=0, vjust=0)
ind.score.graph.ar

#-------------------------------------------------------------------------
#How no of allrounders affect the score/wickets of the opposition team
# no of batsmen
no.of.allrounders<-sort(no.of.allrounders,decreasing=TRUE)
no.of.allrounders
# allrounders=3
opp.wkts.avg.ar3<-mean(odidata[odidata$total.allrounders==3 &
odidata$batting.turn=="2nd","opposition.wickets.lost"])
opp.wkts.avg.ar3
# allrounders=2
```

```
opp.wkts.avg.ar2<-mean(odidata[odidata$total.allrounders==2 &
odidata$batting.turn=="2nd","opposition.wickets.lost"])
opp.wkts.avg.ar2
# allrounders=1
opp.wkts.avg.ar1<-mean(odidata[odidata$total.allrounders==1 &
odidata$batting.turn=="2nd","opposition.wickets.lost"])
opp.wkts.avg.ar1
# allrounders=0
opp.wkts.avg.ar0<-mean(odidata[odidata$total.allrounders==0 &
odidata$batting.turn=="2nd","opposition.wickets.lost"])
opp.wkts.avg.ar0

# allrounders=3
opp.runs.avg.ar3<-mean(odidata[odidata$total.allrounders==3 &
odidata$batting.turn=="2nd","opposition.runs"])
opp.runs.avg.ar3
# allrounders=2
opp.runs.avg.ar2<-mean(odidata[odidata$total.allrounders==2 &
odidata$batting.turn=="2nd","opposition.runs"])
opp.runs.avg.ar2
# allrounders=1
opp.runs.avg.ar1<-mean(odidata[odidata$total.allrounders==1 &
odidata$batting.turn=="2nd","opposition.runs"])
opp.runs.avg.ar1
# allrounders=0
opp.runs.avg.ar0<-mean(odidata[odidata$total.allrounders==0 &
odidata$batting.turn=="2nd","opposition.runs"])
opp.runs.avg.ar0
#-------------------------------------------------------------------------------------
#comparative graphical representation of indian score
#depending on no of indian allrounders playing the match
```

```
wicket.opp.ar<-
c(opp.wkts.avg.ar3,opp.wkts.avg.ar2,opp.wkts.avg.ar1,opp.wkts.avg.ar0)
wicket.opp.ar
opp.runs.ar<-c(opp.runs.avg.ar3,opp.runs.avg.ar2,opp.runs.avg.ar1,opp.runs.avg.ar0)
opp.runs.ar
no.indian.allrounders<-c("3","2","1","0")
no.indian.allrounders
opp.scorecard.ar<-data.frame(no.indian.allrounders,opp.runs.ar,wicket.opp.ar)
opp.scorecard.ar
opp.score.graph.ar<-ggplot(opp.scorecard.ar, aes(x = wicket.opp.ar, y = opp.runs.ar))
+geom_point(aes(color = factor(no.indian.allrounders)),shape=16,size=5)+labs(title =
"no of indian allrounders & opposition score")+labs(x = "average opposition wickets to
fall",y = "average opposition runs",color = "no of IND allrounders playing",title = "NO
OF IND ALLROUNDERS PLAYING VS OPPOSITION SCORE",caption = "when
OPPOSITION bats 1st")+scale_x_continuous(breaks = seq(5, 10, by = 1))
+scale_y_continuous(breaks = seq(150,350, by =
1))+theme_dark()+geom_text(aes(label=no.indian.allrounders),hjust=0, vjust=0)
opp.score.graph.ar

#---------------------------------------------------------------------
#8.How no of batsmen affect the result when india is chasing?
no.of.batsmen<-unique(odidata$no.of.batsmen)
no.of.batsmen # number of batsmen india has played
# india has played 7,6,5,4 batsmen since 1 jan,2000
# affect on result when india plays 7 batsmen
#1. no of such matches
chase.bt7<-nrow(odidata[odidata$no.of.batsmen==7 & odidata$batting.turn=="2nd",])
chase.bt7
#2. no of matches won
chase.bt7.won<-nrow(odidata[odidata$no.of.batsmen==7 &
odidata$match.result.for.india=="won" & odidata$batting.turn=="2nd",])
```

```
chase.bt7.won
#3. no of matches lost
chase.bt7.lost<-nrow(odidata[odidata$no.of.batsmen==7 &
odidata$match.result.for.india=="lost" & odidata$batting.turn=="2nd",])
chase.bt7.lost
#3. no of matches tied
chase.bt7.tied<-nrow(odidata[odidata$no.of.batsmen==7 &
odidata$match.result.for.india=="tied" & odidata$batting.turn=="2nd",])
chase.bt7.tied
#above results in percentages
# winning %
per.chase.bt7.won<-chase.bt7.won/chase.bt7*100
per.chase.bt7.won
# loss %
per.chase.bt7.lost<-chase.bt7.lost/chase.bt7*100
per.chase.bt7.lost
# tied %
per.chase.bt7.tied<-chase.bt7.tied/chase.bt7*100
per.chase.bt7.tied
# affect on result when india plays 6 batsmen
#1. no of such matches
chase.bt6<-nrow(odidata[odidata$no.of.batsmen==6 & odidata$batting.turn=="2nd",])
chase.bt6
#2. no of matches won
chase.bt6.won<-nrow(odidata[odidata$no.of.batsmen==6 &
odidata$match.result.for.india=="won" & odidata$batting.turn=="2nd",])
chase.bt6.won
#3. no of matches lost
chase.bt6.lost<-nrow(odidata[odidata$no.of.batsmen==6 &
odidata$match.result.for.india=="lost" & odidata$batting.turn=="2nd",])
chase.bt6.lost
```

```
#3. no of matches tied
chase.bt6.tied<-nrow(odidata[odidata$no.of.batsmen==6 &
odidata$match.result.for.india=="tied" & odidata$batting.turn=="2nd",])
chase.bt6.tied
#above results in percentages
# winning %
per.chase.bt6.won<-chase.bt6.won/chase.bt6*100
per.chase.bt6.won
# loss %
per.chase.bt6.lost<-chase.bt6.lost/chase.bt6*100
per.chase.bt6.lost
# tied %
per.chase.bt6.tied<-chase.bt6.tied/chase.bt6*100
per.chase.bt6.tied

# affect on result when india plays 5 batsmen
#1. no of such matches
chase.bt5<-nrow(odidata[odidata$no.of.batsmen==5 & odidata$batting.turn=="2nd",])
chase.bt5
#2. no of matches won
chase.bt5.won<-nrow(odidata[odidata$no.of.batsmen==5 &
odidata$match.result.for.india=="won" & odidata$batting.turn=="2nd",])
chase.bt5.won
#3. no of matches lost
chase.bt5.lost<-nrow(odidata[odidata$no.of.batsmen==5 &
odidata$match.result.for.india=="lost" & odidata$batting.turn=="2nd",])
chase.bt5.lost
#3. no of matches tied
chase.bt5.tied<-nrow(odidata[odidata$no.of.batsmen==5 &
odidata$match.result.for.india=="tied" & odidata$batting.turn=="2nd",])
chase.bt5.tied
```

```
#above results in percentages
# winning %
per.chase.bt5.won<-chase.bt5.won/chase.bt5*100
per.chase.bt5.won
# loss %
per.chase.bt5.lost<-chase.bt5.lost/chase.bt5*100
per.chase.bt5.lost
# tied %
per.chase.bt5.tied<-chase.bt5.tied/chase.bt5*100
per.chase.bt5.tied

# affect on result when india plays 4 batsmen
#1. no of such matches
chase.bt4<-nrow(odidata[odidata$no.of.batsmen==4 & odidata$batting.turn=="2nd",])
chase.bt4
#2. no of matches won
chase.bt4.won<-nrow(odidata[odidata$no.of.batsmen==4                    &
odidata$match.result.for.india=="won" & odidata$batting.turn=="2nd",])
chase.bt4.won
#3. no of matches lost
chase.bt4.lost<-nrow(odidata[odidata$no.of.batsmen==4                   &
odidata$match.result.for.india=="lost" & odidata$batting.turn=="2nd",])
chase.bt4.lost
#4. no of matches tied
chase.bt4.tied<-nrow(odidata[odidata$no.of.batsmen==4                   &
odidata$match.result.for.india=="tied" & odidata$batting.turn=="2nd",])
chase.bt4.tied
#above results in percentages
# winning %
per.chase.bt4.won<-chase.bt4.won/chase.bt4*100
per.chase.bt4.won
```

```
# loss %
per.chase.bt4.lost<-chase.bt4.lost/chase.bt4*100
per.chase.bt4.lost
# tied %
per.chase.bt4.tied<-chase.bt4.tied/chase.bt4*100
per.chase.bt4.tied

#-------------------------------------------------------------------------------------------
#comparative graphical representation of batsmen and decisions
no.of.batsmen<-sort(no.of.batsmen,decreasing=TRUE)
no.of.batsmen
chase.bt.no<-c(7,7,7,6,6,6,5,5,5,4,4,4)
chase.bt.no
result.type<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
result.type
result.per.chase.bt<-
c(per.chase.bt7.won,per.chase.bt7.lost,per.chase.bt7.tied,per.chase.bt6.won,per.chase.bt
6.lost,per.chase.bt6.tied,per.chase.bt5.won,per.chase.bt5.lost,per.chase.bt5.tied,per.chas
e.bt4.won,per.chase.bt4.lost,per.chase.bt4.tied)
result.per.chase.bt
chase.bt.numb.result<-data.frame(chase.bt.no,result.type,result.per.chase.bt)
chase.bt.numb.result
# creating the y-position for adding labels to the bars
pp1.chase.bt.res <- ddply(chase.bt.numb.result, .(chase.bt.no),transform, pos =
cumsum(result.per.chase.bt) - (0.5 * result.per.chase.bt))
pp1.chase.bt.res
pp1.chase.bt.res$result.type <- factor(pp1.chase.bt.res$result.type, levels =
c("tied","lost","won"))

#creating the graph
```

```
no.of.chase.bt.res.graph<-ggplot(pp1.chase.bt.res, aes(fill=result.type,
y=result.per.chase.bt, x=chase.bt.no)) + geom_bar(position="fill", stat="identity")
no.of.chase.bt.res.graph#this is the graph
# adding the labels to the graph
fill <- c("gray34", "darkred","deepskyblue4")
no.of.chase.bt.res.graph+geom_text(aes(label =
paste(round((result.per.chase.bt),2),"%"),y=pos/100,size =
4),colour="greenyellow",fontface="bold")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle("result %s and
number of batsmen when india chases") + scale_fill_manual(values=fill)+labs(x =
"number of batsmen", y = "% of match results")



#------------------------------------------------------------------------------

#Type of bowlers India plays against Asian and Sena countries.
# average number of bowlers india plays against asian countries
aver.bw.asia<-mean(odidata[odidata$asian.opposition=="TRUE","no.of.bowlers"])
aver.bw.asia
# average number of bowlers india plays against sena countries
aver.bw.sena<-mean(odidata[odidata$sena.opposition=="TRUE","no.of.bowlers"])
aver.bw.sena
# average number of spin bowlers india plays against sena countries
aver.bw.sena.spin<-
mean(odidata[odidata$sena.opposition=="TRUE","no.of.spinners"])
aver.bw.sena.spin
# average number of spin bowlers india plays aginst asian countries
aver.bw.asia.spin<-
mean(odidata[odidata$asian.opposition=="TRUE","no.of.spinners"])
aver.bw.asia.spin
```

```
# average number of fast bowlers india plays against sena countries
aver.bw.sena.fast<-mean(odidata[odidata$sena.opposition=="TRUE","no.of.pacers"])
aver.bw.sena.fast
# average number of fast bowlers india plays aginst asian countries
aver.bw.asia.fast<-mean(odidata[odidata$asian.opposition=="TRUE","no.of.pacers"])
aver.bw.asia.fast
#graphical representation of above data
#depending on no of indian allrounders playing the match
bw.host.region<-c("asia","asia","asia","sena","sena","sena")
bw.host.region
bw.type.sena.asia<-c("average no of bowlers","average no of spin bowlers","average no of fast bowlers","average no of bowlers","average no of spin bowlers","average no of fast bowlers")
bw.type.sena.asia
bw.value.sena.asia<-
c(aver.bw.asia,aver.bw.asia.spin,aver.bw.asia.fast,aver.bw.sena,aver.bw.sena.spin,aver.bw.sena.fast)
bw.value.sena.asia
bw.asia.sena<- data.frame(bw.host.region,bw.type.sena.asia,bw.value.sena.asia)
bw.asia.sena
# creating the y-position for adding labels to the bars
bw.asia.sena <- ddply(bw.asia.sena, .(bw.host.region),transform, pos =bw.value.sena.asia/2)
bw.asia.sena
bw.asia.sena$bw.type.sena.asia <- factor(bw.asia.sena$bw.type.sena.asia, levels = c("average no of bowlers","average no of spin bowlers","average no of fast bowlers"))
#creating the graph
bw.result.sena<-ggplot(bw.asia.sena, aes(fill=bw.type.sena.asia, y=bw.value.sena.asia, x=bw.host.region)) + geom_bar(position=position_dodge(), stat="identity")
bw.result.sena#this is the graph
# adding the labels to the graph
```

```
fill <- c("deeppink1", "darkturquoise","chartreuse1")
bw.result.sena+geom_text(aes(label = paste(round((bw.value.sena.asia),2)),y=pos,size = 4),colour="black",fontface="bold",position = position_dodge(width = 0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title = element_blank()) + ggtitle("average no bowlers and their types vs sena and asian opponents") + scale_fill_manual(values=fill)+labs(x = "OPPONENT TYPE", y = "AVERAGE NUMBER OF BOWLERS")

#------------------------------------------------------------------------
#Type of bowlers India plays in Asian and Sena countries.
# average number of bowlers india plays in asian countries
aver.bw.asia.host<-mean(odidata[odidata$asian.host..Y.N.=="TRUE","no.of.bowlers"])
aver.bw.asia.host
# average number of bowlers india plays in sena countries
aver.bw.sena.host<-
mean(odidata[odidata$SENA.host..Y.N.=="TRUE","no.of.bowlers"])
aver.bw.sena.host
# average number of spin bowlers india in against sena countries
aver.bw.sena.spin.host<-
mean(odidata[odidata$SENA.host..Y.N.=="TRUE","no.of.spinners"])
aver.bw.sena.spin.host
# average number of spin bowlers india plays in asian countries
aver.bw.asia.spin.host<-
mean(odidata[odidata$asian.host..Y.N.=="TRUE","no.of.spinners"])
aver.bw.asia.spin.host
# average number of fast bowlers india plays in sena countries
aver.bw.sena.fast.host<-
mean(odidata[odidata$SENA.host..Y.N.=="TRUE","no.of.pacers"])
aver.bw.sena.fast.host
# average number of fast bowlers india plays in asian countries
```

```
aver.bw.asia.fast.host<-
mean(odidata[odidata$asian.host..Y.N.=="TRUE","no.of.pacers"])
aver.bw.asia.fast.host
#graphical representation of above data
#depending on no of indian allrounders playing the match
bw.host.region<-c("asia","asia","asia","sena","sena","sena")
bw.host.region
bw.type.sena.asia<-c("average no of bowlers","average no of spin bowlers","average no
of fast bowlers","average no of bowlers","average no of spin bowlers","average no of
fast bowlers")
bw.type.sena.asia
bw.value.sena.asia.host<-
c(aver.bw.asia.host,aver.bw.asia.spin.host,aver.bw.asia.fast.host,aver.bw.sena.host,aver
.bw.sena.spin.host,aver.bw.sena.fast.host)
bw.value.sena.asia.host
bw.asia.sena.host<-
data.frame(bw.host.region,bw.type.sena.asia,bw.value.sena.asia.host)
bw.asia.sena.host
# creating the y-position for adding labels to the bars
bw.asia.sena.host <- ddply(bw.asia.sena.host, .(bw.host.region),transform, pos
=bw.value.sena.asia.host/2)
bw.asia.sena.host
bw.asia.sena.host$bw.type.sena.asia <- factor(bw.asia.sena.host$bw.type.sena.asia,
levels = c("average no of bowlers","average no of spin bowlers","average no of fast
bowlers"))
#creating the graph
bw.result.sena.host<-ggplot(bw.asia.sena.host, aes(fill=bw.type.sena.asia,
y=bw.value.sena.asia.host, x=bw.host.region)) + geom_bar(position=position_dodge(),
stat="identity")
bw.result.sena.host#this is the graph
# adding the labels to the graph
```

```
fill <- c("deeppink1", "darkturquoise","chartreuse1")
bw.result.sena.host+geom_text(aes(label = paste(round((bw.value.sena.asia.host),2)),y=pos,size = 4),colour="black",fontface="bold",position = position_dodge(width = 0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title = element_blank()) + ggtitle("average no bowlers and their types in sena and asian countries") + scale_fill_manual(values=fill)+labs(x = "HOST TYPE", y = "AVERAGE NUMBER OF BOWLERS")


#-------------------------------------------------------------------------
#How type of bowlers in Asian and Sena countries affect the result?
# number of matches for various combinations of bowlers,spinners and pacers
# in overall matches
n404<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.pacers==4,])
n404
n514<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.pacers==4,])
n514
n303<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.pacers==3,])
n303
n413<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.pacers==3,])
n413
```

```
n523<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3,])
n523
n312<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2,])
n312
n422<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2,])
n422
n532<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2,])
n532
n211<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1,])
n211
n321<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1,])
n321
n330<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0,])
n330
n202<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2,])
```

```
n202
#graphical representation of above data
comb.bw<-c("4bw 0sp 4pa","5bw 1sp 4pa","3bw 0sp 3pa","4bw 1sp 3pa","5bw 2sp 3pa","3bw 1sp 2pa","4bw 2sp 2pa","5bw 3sp 2pa","2bo 1sp 1pa","3bw 2sp 1pa","3bw 3sp 0pa","2bw 0sp 2pa")
comb.bw
no.comb.matches<-
c(n404,n514,n303,n413,n523,n312,n422,n532,n211,n321,n330,n202)
no.comb.matches
bow.comb.matches<-data.frame(comb.bw,no.comb.matches)
bow.comb.matches
# creating the y-position for adding labels to the bars
bow.comb.matches <- ddply(bow.comb.matches, .(comb.bw),transform, pos =no.comb.matches/2)
bow.comb.matches
bow.comb.matches$comb.bw <- factor(bow.comb.matches$comb.bw, levels = c("4bw 0sp 4pa","5bw 1sp 4pa","3bw 0sp 3pa","4bw 1sp 3pa","5bw 2sp 3pa","3bw 1sp 2pa","4bw 2sp 2pa","5bw 3sp 2pa","2bo 1sp 1pa","3bw 2sp 1pa"))
#creating the graph
graph.bow.comb.matches<-ggplot(bow.comb.matches, aes(fill=comb.bw, y=no.comb.matches, x=comb.bw)) + geom_bar(position=position_dodge(), stat="identity")
graph.bow.comb.matches#this is the graph
# adding the labels to the graph
fill <- c("gold1", "rosybrown1","olivedrab3","magenta1","darkcyan","tan4","turquoise3","cornsilk4","mediumorchid3","springgreen3","red","navy")
graph.bow.comb.matches+geom_text(aes(label = paste(round((no.comb.matches),2)),y=pos,size = 4),colour="black",fontface="bold",position = position_dodge(width = 0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
```

```
element_text()) + ggtitle("combination of bowlers and matches played") + scale_fill_manual(values=fill)+labs(x = "BOWLING COMBINATION", y = "NUMBER OF MATCHES PLAYED")

#-------------------------------------------------------------------------------------
#13.  How type of bowlers in overall matches affect the result?
n404<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.pacers==4,])
n404
n514<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.pacers==4,])
n514
n303<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.pacers==3,])
n303
n413<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.pacers==3,])
n413
n523<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.pacers==3,])
n523
n312<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.pacers==2,])
n312
```

```
n422<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2,])
n422
n532<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2,])
n532
n211<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1,])
n211
n321<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1,])
n321
n330<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0,])
n330
n202<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2,])
n202
#now we calculate no of matches for these combinations, win,loss & tied percentages
#number of wins for these combinations
n404.win<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$match.result.for.india=="won",])
n404.win
```

```
n514.win<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.p
acers==4&odidata$match.result.for.india=="won",])
n514.win
n303.win<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$match.result.for.india=="won",])
n303.win
n413.win<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$match.result.for.india=="won",])
n413.win
n523.win<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$match.result.for.india=="won",])
n523.win
n312.win<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$match.result.for.india=="won",])
n312.win
n422.win<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$match.result.for.india=="won",])
n422.win
n532.win<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2&odidata$match.result.for.india=="won",])
n532.win
n211.win<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$match.result.for.india=="won",])
```

```
n211.win
n321.win<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$match.result.for.india=="won",])
n321.win
n330.win<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0&odidata$match.result.for.india=="won",])
n330.win
n202.win<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2&odidata$match.result.for.india=="won",])
n202.win
#number of losses for these combinations
n404.loss<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$match.result.for.india=="lost",])
n404.loss
n514.loss<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.p
acers==4&odidata$match.result.for.india=="lost",])
n514.loss
n303.loss<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$match.result.for.india=="lost",])
n303.loss
n413.loss<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$match.result.for.india=="lost",])
n413.loss
```

```
n523.loss<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$match.result.for.india=="lost",])
n523.loss
n312.loss<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$match.result.for.india=="lost",])
n312.loss
n422.loss<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$match.result.for.india=="lost",])
n422.loss
n532.loss<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2&odidata$match.result.for.india=="lost",])
n532.loss
n211.loss<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$match.result.for.india=="lost",])
n211.loss
n321.loss<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$match.result.for.india=="lost",])
n321.loss
n330.loss<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0&odidata$match.result.for.india=="lost",])
n330.loss
n202.loss<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2&odidata$match.result.for.india=="lost",])
```

```
n202.loss
#number of tie for these combinations
n404.tie<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$match.result.for.india=="tied",])
n404.tie
n514.tie<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.p
acers==4&odidata$match.result.for.india=="tied",])
n514.tie
n303.tie<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$match.result.for.india=="tied",])
n303.tie
n413.tie<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$match.result.for.india=="tied",])
n413.tie
n523.tie<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$match.result.for.india=="tied",])
n523.tie
n312.tie<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$match.result.for.india=="tied",])
n312.tie
n422.tie<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$match.result.for.india=="tied",])
n422.tie
```

```
n532.tie<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2&odidata$match.result.for.india=="tied",])
n532.tie
n211.tie<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$match.result.for.india=="tied",])
n211.tie
n321.tie<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$match.result.for.india=="tied",])
n321.tie
n330.tie<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0&odidata$match.result.for.india=="tied",])
n330.tie
n202.tie<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2&odidata$match.result.for.india=="tied",])
n202.tie
#percentage of win,loss and tie for these combinations

#wins
per.won.404<-n404.win/n404*100
per.won.404
per.won.514<-n514.win/n514*100
per.won.514
per.won.303<-n303.win/n303*100
per.won.303
per.won.413<-n413.win/n413*100
per.won.413
```

```
per.won.523<-n523.win/n523*100
per.won.523
per.won.312<-n312.win/n312*100
per.won.312
per.won.422<-n422.win/n422*100
per.won.422
per.won.532<-n532.win/n532*100
per.won.532
per.won.211<-n211.win/n211*100
per.won.211
per.won.321<-n321.win/n321*100
per.won.321
per.won.330<-n330.win/n330*100
per.won.330
per.won.202<-n202.win/n202*100
per.won.202
#losses
per.loss.404<-n404.loss/n404*100
per.loss.404
per.loss.514<-n514.loss/n514*100
per.loss.514
per.loss.303<-n303.loss/n303*100
per.loss.303
per.loss.413<-n413.loss/n413*100
per.loss.413
per.loss.523<-n523.loss/n523*100
per.loss.523
per.loss.312<-n312.loss/n312*100
per.loss.312
per.loss.422<-n422.loss/n422*100
per.loss.422
```

```
per.loss.532<-n532.loss/n532*100
per.loss.532
per.loss.211<-n211.loss/n211*100
per.loss.211
per.loss.321<-n321.loss/n321*100
per.loss.321
per.loss.330<-n330.loss/n330*100
per.loss.330
per.loss.202<-n202.loss/n202*100
per.loss.202
#tie
per.tie.404<-n404.tie/n404*100
per.tie.404
per.tie.514<-n514.tie/n514*100
per.tie.514
per.tie.303<-n303.tie/n303*100
per.tie.303
per.tie.413<-n413.tie/n413*100
per.tie.413
per.tie.523<-n523.tie/n523*100
per.tie.523
per.tie.312<-n312.tie/n312*100
per.tie.312
per.tie.422<-n422.tie/n422*100
per.tie.422
per.tie.532<-n532.tie/n532*100
per.tie.532
per.tie.211<-n211.tie/n211*100
per.tie.211
per.tie.321<-n321.tie/n321*100
per.tie.321
```

```
per.tie.330<-n330.tie/n330*100
per.tie.330
per.tie.202<-n202.tie/n202*100
per.tie.202
#graphical representation of this data
#number of matches for every combination
no.comb.matches
no.comb.matches.2<-
c(n404,n404,n404,n514,n514,n514,n303,n303,n303,n413,n413,n413,n523,n523,n523,n
312,n312,n312,n422,n422,n422,n532,n532,n532,n211,n211,n211,n321,n321,n321,n33
0,n330,n330,n202,n202,n202)
no.comb.matches.2
comp.comb.bw<-c("4bw 0sp 4pa","4bw 0sp 4pa","4bw 0sp 4pa","5bw 1sp 4pa","5bw
1sp 4pa","5bw 1sp 4pa","3bw 0sp 3pa","3bw 0sp 3pa","3bw 0sp 3pa","4bw 1sp
3pa","4bw 1sp 3pa","4bw 1sp 3pa","5bw 2sp 3pa","5bw 2sp 3pa","5bw 2sp 3pa","3bw
1sp 2pa","3bw 1sp 2pa","3bw 1sp 2pa","4bw 2sp 2pa","4bw 2sp 2pa","4bw 2sp
2pa","5bw 3sp 2pa","5bw 3sp 2pa","5bw 3sp 2pa","2bo 1sp 1pa","2bo 1sp 1pa","2bo 1sp
1pa","3bw 2sp 1pa","3bw 2sp 1pa","3bw 2sp 1pa","3bw 3pa 0sp","3bw 3pa 0sp","3bw
3pa 0sp","2bw 0pa 2sp","2bw 0pa 2sp","2bw 0pa 2sp")
comp.comb.bw
comb.bw.result.type<-
c("win","loss","tie","win","loss","tie","win","loss","tie","win","loss","tie","win","loss",
"tie","win","loss","tie","win","loss","tie","win","loss","tie","win","loss","tie","win","los
s","tie","win","loss","tie","win","loss","tie")
comb.bw.result.type
comp.bw.comb.value<-
c(per.won.404,per.loss.404,per.tie.404,per.won.514,per.loss.514,per.tie.514,per.won.30
3,per.loss.303,per.tie.303,per.won.413,per.loss.413,per.tie.413,per.won.523,per.loss.52
3,per.tie.523,per.won.312,per.loss.312,per.tie.312,per.won.422,per.loss.422,per.tie.422,
per.won.532,per.loss.532,per.tie.532,per.won.211,per.loss.211,per.tie.211,per.won.321,
```

```
per.loss.321,per.tie.321,per.won.330,per.loss.330,per.tie.330,per.won.202,per.loss.202,
per.tie.202)
comp.bw.comb.value
bw.comb.data<-
data.frame(comp.comb.bw,no.comb.matches.2,comb.bw.result.type,comp.bw.comb.val
ue)
bw.comb.data#dataframe created
# fileterin out cases where number of matches>10
bw.comb.data2<-bw.comb.data[bw.comb.data$no.comb.matches.2>10,]
bw.comb.data2#final dataframe

# creating the y-position for adding labels to the bars
bw.comb.data2 <- ddply(bw.comb.data2, .(comp.comb.bw),transform, pos
=comp.bw.comb.value/2)
bw.comb.data2
bw.comb.data2$comb.bw.result.type <- factor(bw.comb.data2$comb.bw.result.type,
levels = c("tie","loss","win"))
#creating the graph
graph.bw.comb.data2<-ggplot(bw.comb.data2, aes(fill=comb.bw.result.type,
y=comp.bw.comb.value, x=comp.comb.bw)) + geom_bar(position=position_dodge(),
stat="identity")
graph.bw.comb.data2#this is the graph
# adding the labels to the graph
fill <- c("maroon1","deepskyblue","lawngreen")
graph.bw.comb.data2+geom_text(aes(label =
paste(round((comp.bw.comb.value),2),"%"),y=pos,size =
4),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle("combination of bowlers and % results") +
scale_fill_manual(values=fill)+labs(x = "BOWLING COMBINATION-->bw=total
bowlers,sp=spinners,pa=pacers", y = "percentage of results")
```

```
#-------------------------------------------------------------------------------
#13.How type of bowlers in Asian and Sena countries affect the result?
#----------------------ASIA-----------------------------------------------------
#number of matches for these combinations
n404.asia<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$asian.host..Y.N.=="TRUE",])
n404.asia
n514.asia<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.p
acers==4&odidata$asian.host..Y.N.=="TRUE",])
n514.asia
n303.asia<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE",])
n303.asia
n413.asia<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE",])
n413.asia
n523.asia<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE",])
n523.asia
n312.asia<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE",])
n312.asia
```

```
n422.asia<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE",])
n422.asia
n532.asia<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE",])
n532.asia
n211.asia<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$asian.host..Y.N.=="TRUE",])
n211.asia
n321.asia<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$asian.host..Y.N.=="TRUE",])
n321.asia

#number of matches won for these combinations
n404.asia.won<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n404.asia.won
n514.asia.won<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.p
acers==4&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n514.asia.won
n303.asia.won<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
```

```
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n303.asia.won
n413.asia.won<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n413.asia.won
n523.asia.won<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n523.asia.won
n312.asia.won<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n312.asia.won
n422.asia.won<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n422.asia.won
n532.asia.won<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n532.asia.won
n211.asia.won<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
```

```
acers==1&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n211.asia.won
n321.asia.won<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="won
",])
n321.asia.won

#number of matches lost for these combinations
n404.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n404.asia.lost
n514.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.p
acers==4&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n514.asia.lost
n303.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n303.asia.lost
n413.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n413.asia.lost
```

```
n523.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n523.asia.lost
n312.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n312.asia.lost
n422.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n422.asia.lost
n532.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n532.asia.lost
n211.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n211.asia.lost
n321.asia.lost<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost"
,])
n321.asia.lost
```

```
#number of matches tied for these combinations
n404.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n404.asia.tied
n514.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==1&odidata$no.of.p
acers==4&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n514.asia.tied
n303.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n303.asia.tied
n413.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n413.asia.tied
n523.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n523.asia.tied
n312.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n312.asia.tied
```

```
n422.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n422.asia.tied
n532.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==3&odidata$no.of.p
acers==2&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n532.asia.tied
n211.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n211.asia.tied
n321.asia.tied<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$asian.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tied"
,])
n321.asia.tied

#percentage of these results
#won
per.n404.asia.won<-n404.asia.won/n404.asia*100
per.n404.asia.won
per.n514.asia.won<-n514.asia.won/n514.asia*100
per.n514.asia.won
per.n303.asia.won<-n303.asia.won/n303.asia*100
per.n303.asia.won
per.n413.asia.won<-n413.asia.won/n413.asia*100
per.n413.asia.won
```

per.n523.asia.won<-n523.asia.won/n523.asia*100

per.n523.asia.won

per.n312.asia.won<-n312.asia.won/n312.asia*100

per.n312.asia.won

per.n422.asia.won<-n422.asia.won/n422.asia*100

per.n422.asia.won

per.n532.asia.won<-n532.asia.won/n532.asia*100

per.n532.asia.won

per.n211.asia.won<-n211.asia.won/n211.asia*100

per.n211.asia.won

per.n321.asia.won<-n321.asia.won/n321.asia*100

per.n321.asia.won

#lost

per.n404.asia.lost<-n404.asia.lost/n404.asia*100

per.n404.asia.lost

per.n514.asia.lost<-n514.asia.lost/n514.asia*100

per.n514.asia.lost

per.n303.asia.lost<-n303.asia.lost/n303.asia*100

per.n303.asia.lost

per.n413.asia.lost<-n413.asia.lost/n413.asia*100

per.n413.asia.lost

per.n523.asia.lost<-n523.asia.lost/n523.asia*100

per.n523.asia.lost

per.n312.asia.lost<-n312.asia.lost/n312.asia*100

per.n312.asia.lost

per.n422.asia.lost<-n422.asia.lost/n422.asia*100

per.n422.asia.lost

per.n532.asia.lost<-n532.asia.lost/n532.asia*100

per.n532.asia.lost

per.n211.asia.lost<-n211.asia.lost/n211.asia*100

```
per.n211.asia.lost
per.n321.asia.lost<-n321.asia.lost/n321.asia*100
per.n321.asia.lost

#tied
per.n404.asia.tied<-n404.asia.tied/n404.asia*100
per.n404.asia.tied
per.n514.asia.tied<-n514.asia.tied/n514.asia*100
per.n514.asia.tied
per.n303.asia.tied<-n303.asia.tied/n303.asia*100
per.n303.asia.tied
per.n413.asia.tied<-n413.asia.tied/n413.asia*100
per.n413.asia.tied
per.n523.asia.tied<-n523.asia.tied/n523.asia*100
per.n523.asia.tied
per.n312.asia.tied<-n312.asia.tied/n312.asia*100
per.n312.asia.tied
per.n422.asia.tied<-n422.asia.tied/n422.asia*100
per.n422.asia.tied
per.n532.asia.tied<-n532.asia.tied/n532.asia*100
per.n532.asia.tied
per.n211.asia.tied<-n211.asia.tied/n211.asia*100
per.n211.asia.tied
per.n321.asia.tied<-n321.asia.tied/n321.asia*100
per.n321.asia.tied

#graphical representation of this data
#number of matches for every combination
no.comb.matches.asia
no.comb.matches.asia<-
c(n404.asia,n404.asia,n404.asia,n514.asia,n514.asia,n514.asia,n303.asia,n303.asia,n303
```

```
.asia,n413.asia,n413.asia,n413.asia,n523.asia,n523.asia,n523.asia,n312.asia,n312.asia,n
312.asia,n422.asia,n422.asia,n422.asia,n532.asia,n532.asia,n532.asia,n211.asia,n211.as
ia,n211.asia,n321.asia,n321.asia,n321.asia)
comp.comb.bw.asia<-c("4bw 0sp 4pa","4bw 0sp 4pa","4bw 0sp 4pa","5bw 1sp
4pa","5bw 1sp 4pa","5bw 1sp 4pa","3bw 0sp 3pa","3bw 0sp 3pa","3bw 0sp 3pa","4bw
1sp 3pa","4bw 1sp 3pa","4bw 1sp 3pa","5bw 2sp 3pa","5bw 2sp 3pa","5bw 2sp
3pa","3bw 1sp 2pa","3bw 1sp 2pa","3bw 1sp 2pa","4bw 2sp 2pa","4bw 2sp 2pa","4bw
2sp 2pa","5bw 3sp 2pa","5bw 3sp 2pa","5bw 3sp 2pa","2bo 1sp 1pa","2bo 1sp 1pa","2bo
1sp 1pa","3bw 2sp 1pa","3bw 2sp 1pa","3bw 2sp 1pa")
comp.comb.bw.asia
comb.bw.result.type<-
c("win","loss","tie","win","loss","tie","win","loss","tie","win","loss","tie","win","loss",
"tie","win","loss","tie","win","loss","tie","win","loss","tie","win","loss","tie","win","los
s","tie")
comb.bw.result.type
comp.bw.comb.value.asia<-
c(per.n404.asia.won,per.n404.asia.lost,per.n404.asia.tied,per.n514.asia.won,per.n514.as
ia.lost,per.n514.asia.tied,per.n303.asia.won,per.n303.asia.lost,per.n303.asia.tied,per.n41
3.asia.won,per.n413.asia.lost,per.n413.asia.tied,per.n523.asia.won,per.n523.asia.lost,pe
r.n523.asia.tied,per.n312.asia.won,per.n312.asia.lost,per.n312.asia.tied,per.n422.asia.w
on,per.n422.asia.lost,per.n422.asia.tied,per.n532.asia.won,per.n532.asia.lost,per.n532.a
sia.tied,per.n211.asia.won,per.n211.asia.lost,per.n211.asia.tied,per.n321.asia.won,per.n
321.asia.lost,per.n321.asia.tied)
comp.bw.comb.value.asia
bw.comb.data.asia.2<-
data.frame(comp.comb.bw.asia,comb.bw.result.type,comp.bw.comb.value.asia)
bw.comb.data.asia.2#dataframe created
#final dataframe

# creating the y-position for adding labels to the bars
```

```
bw.comb.data.asia.2 <- ddply(bw.comb.data.asia.2, .(comp.comb.bw.asia),transform,
pos =comp.bw.comb.value.asia/2)
bw.comb.data.asia.2
bw.comb.data.asia.2$comb.bw.result.type <-
factor(bw.comb.data.asia.2$comb.bw.result.type, levels = c("tie","loss","win"))

#creating the graph
graph.bw.comb.data.asia.2<-ggplot(bw.comb.data.asia.2, aes(fill=comb.bw.result.type,
y=comp.bw.comb.value.asia, x=comp.comb.bw.asia)) +
geom_bar(position=position_dodge(), stat="identity")
graph.bw.comb.data.asia.2#this is the graph
# adding the labels to the graph
fill <- c("gold","turquoise2","hotpink2")
graph.bw.comb.data.asia.2+geom_text(aes(label =
paste(round((comp.bw.comb.value.asia),2),"%"),y=pos,size =
2),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle("combination of bowlers and % results in ASIA") +
scale_fill_manual(values=fill)+labs(x = "BOWLING COMBINATION-->bw=total
bowlers,sp=spinners,pa=pacers", y = "percentage of results")

#-------------------------------------------------------------------------------------
#13.How type of bowlers in SENA countries affect the result?
#----------------------SENA-------------------------------------------------------
#number of matches for these combinations
n404.sena<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$SENA.host..Y.N.=="TRUE",])
n404.sena
```

```
n303.sena<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE",])
n303.sena
n413.sena<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE",])
n413.sena
n523.sena<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE",])
n523.sena
n312.sena<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE",])
n312.sena
n422.sena<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE",])
n422.sena
n211.sena<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$SENA.host..Y.N.=="TRUE",])
n211.sena
n321.sena<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$SENA.host..Y.N.=="TRUE",])
n321.sena
n330.sena<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0&odidata$SENA.host..Y.N.=="TRUE",])
```

```
n330.sena
n202.sena<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE",])
n202.sena
#number of matches won for these combinations
n404.sena.won<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n404.sena.won
n303.sena.won<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n303.sena.won
n413.sena.won<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n413.sena.won
n523.sena.won<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n523.sena.won
n312.sena.won<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n312.sena.won
```

```
n422.sena.won<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n422.sena.won
n211.sena.won<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n211.sena.won
n321.sena.won<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n321.sena.won
n330.sena.won<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n330.sena.won
n202.sena.won<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="wo
n",])
n202.sena.won
#number of matches lost for these combinations
n404.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n404.sena.lost
```

```
n303.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n303.sena.lost
n413.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n413.sena.lost
n523.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n523.sena.lost
n312.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n312.sena.lost
n422.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n422.sena.lost
n211.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n211.sena.lost
```

```
n321.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n321.sena.lost
n330.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n330.sena.lost
n202.sena.lost<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="lost
",])
n202.sena.lost
#number of matches tied for these combinations
n404.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==0&odidata$no.of.p
acers==4&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n404.sena.tied
n303.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==0&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n303.sena.tied
n413.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==1&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n413.sena.tied
```

```
n523.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==5&odidata$no.of.spinners==2&odidata$no.of.p
acers==3&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n523.sena.tied
n312.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==1&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n312.sena.tied
n422.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==4&odidata$no.of.spinners==2&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n422.sena.tied
n211.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==1&odidata$no.of.p
acers==1&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n211.sena.tied
n321.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==2&odidata$no.of.p
acers==1&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n321.sena.tied
n330.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==3&odidata$no.of.spinners==3&odidata$no.of.p
acers==0&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n330.sena.tied
```

```
n202.sena.tied<-
nrow(odidata[odidata$no.of.bowlers==2&odidata$no.of.spinners==0&odidata$no.of.p
acers==2&odidata$SENA.host..Y.N.=="TRUE"&odidata$match.result.for.india=="tie
d",])
n202.sena.tied
#percentage of these results
#won
per.n404.sena.won<-n404.sena.won/n404.sena*100
per.n404.sena.won
per.n303.sena.won<-n303.sena.won/n303.sena*100
per.n303.sena.won
per.n413.sena.won<-n413.sena.won/n413.sena*100
per.n413.sena.won
per.n523.sena.won<-n523.sena.won/n523.sena*100
per.n523.sena.won
per.n312.sena.won<-n312.sena.won/n312.sena*100
per.n312.sena.won
per.n422.sena.won<-n422.sena.won/n422.sena*100
per.n422.sena.won
per.n211.sena.won<-n211.sena.won/n211.sena*100
per.n211.sena.won
per.n321.sena.won<-n321.sena.won/n321.sena*100
per.n321.sena.won
per.n330.sena.won<-n330.sena.won/n330.sena*100
per.n330.sena.won
per.n202.sena.won<-n202.sena.won/n202.sena*100
per.n202.sena.won

#lost
per.n404.sena.lost<-n404.sena.lost/n404.sena*100
per.n404.sena.lost
```

per.n303.sena.lost<-n303.sena.lost/n303.sena*100

per.n303.sena.lost

per.n413.sena.lost<-n413.sena.lost/n413.sena*100

per.n413.sena.lost

per.n523.sena.lost<-n523.sena.lost/n523.sena*100

per.n523.sena.lost

per.n312.sena.lost<-n312.sena.lost/n312.sena*100

per.n312.sena.lost

per.n422.sena.lost<-n422.sena.lost/n422.sena*100

per.n422.sena.lost

per.n211.sena.lost<-n211.sena.lost/n211.sena*100

per.n211.sena.lost

per.n321.sena.lost<-n321.sena.lost/n321.sena*100

per.n321.sena.lost

per.n330.sena.lost<-n330.sena.lost/n330.sena*100

per.n330.sena.lost

per.n202.sena.lost<-n202.sena.lost/n202.sena*100

per.n202.sena.lost

#tied

per.n404.sena.tied<-n404.sena.tied/n404.sena*100

per.n404.sena.tied

per.n303.sena.tied<-n303.sena.tied/n303.sena*100

per.n303.sena.tied

per.n413.sena.tied<-n413.sena.tied/n413.sena*100

per.n413.sena.tied

per.n523.sena.tied<-n523.sena.tied/n523.sena*100

per.n523.sena.tied

per.n312.sena.tied<-n312.sena.tied/n312.sena*100

per.n312.sena.tied

per.n422.sena.tied<-n422.sena.tied/n422.sena*100

per.n422.sena.tied

```
per.n211.sena.tied<-n211.sena.tied/n211.sena*100
per.n211.sena.tied
per.n321.sena.tied<-n321.sena.tied/n321.sena*100
per.n321.sena.tied
per.n330.sena.tied<-n330.sena.tied/n330.sena*100
per.n330.sena.tied
per.n202.sena.tied<-n202.sena.tied/n202.sena*100
per.n202.sena.tied

#graphical representation of this data
#number of matches for every combination
no.comb.matches.sena<-
c(n404.sena,n404.sena,n404.sena,n303.sena,n303.sena,n303.sena,n413.sena,n413.sena,
n413.sena,n523.sena,n523.sena,n523.sena,n312.sena,n312.sena,n312.sena,n422.sena,n4
22.sena,n422.sena,n211.sena,n211.sena,n211.sena,n321.sena,n321.sena,n321.sena,n330
.sena,n330.sena,n330.sena,n202.sena,n202.sena,n202.sena)
no.comb.matches.sena
comp.comb.bw.sena<-c("4bw 0sp 4pa","4bw 0sp 4pa","4bw 0sp 4pa","3bw 0sp
3pa","3bw 0sp 3pa","3bw 0sp 3pa","4bw 1sp 3pa","4bw 1sp 3pa","4bw 1sp 3pa","5bw
2sp 3pa","5bw 2sp 3pa","5bw 2sp 3pa","3bw 1sp 2pa","3bw 1sp 2pa","3bw 1sp
2pa","4bw 2sp 2pa","4bw 2sp 2pa","4bw 2sp 2pa","2bo 1sp 1pa","2bo 1sp 1pa","2bo 1sp
1pa","3bw 2sp 1pa","3bw 2sp 1pa","3bw 2sp 1pa","3bw 0sp 3pa","3bw 0sp 3pa","3bw
0sp 3pa","2bw 0sp 2pa","2bw 0sp 2pa","2bw 0sp 2pa")
comp.comb.bw.sena
comb.bw.result.type<-
c("win","loss","tie","win","loss","tie","win","loss","tie","win","loss","tie","win","loss",
"tie","win","loss","tie","win","loss","tie","win","loss","tie","win","loss","tie","win","los
s","tie")
comb.bw.result.type
comp.bw.comb.value.sena<-
c(per.n404.sena.won,per.n404.sena.lost,per.n404.sena.tied,per.n303.sena.won,per.n303.
```

```
sena.lost,per.n303.sena.tied,per.n413.sena.won,per.n413.sena.lost,per.n413.sena.tied,pe
r.n523.sena.won,per.n523.sena.lost,per.n523.sena.tied,per.n312.sena.won,per.n312.sena
.lost,per.n312.sena.tied,per.n422.sena.won,per.n422.sena.lost,per.n422.sena.tied,per.n2
11.sena.won,per.n211.sena.lost,per.n211.sena.tied,per.n321.sena.won,per.n321.sena.los
t,per.n321.sena.tied,per.n330.sena.won,per.n330.sena.lost,per.n330.sena.tied,per.n202.s
ena.won,per.n202.sena.lost,per.n202.sena.tied)
comp.bw.comb.value.sena
bw.comb.data.sena<-
data.frame(comp.comb.bw.sena,comb.bw.result.type,comp.bw.comb.value.sena)
bw.comb.data.sena#dataframe created
# fileterin out cases where number of matches>10
bw.comb.data.sena.2<-
bw.comb.data.sena[bw.comb.data.sena$no.comb.matches.sena>10,]
bw.comb.data.sena.2#final dataframe

# creating the y-position for adding labels to the bars
bw.comb.data.sena <- ddply(bw.comb.data.sena, .(comp.comb.bw.sena),transform, pos
=comp.bw.comb.value.sena/2)
bw.comb.data.sena
bw.comb.data.sena$comb.bw.result.type <-
factor(bw.comb.data.sena$comb.bw.result.type, levels = c("tie","loss","win"))
#creating the graph
graph.bw.comb.data.sena<-ggplot(bw.comb.data.sena, aes(fill=comb.bw.result.type,
y=comp.bw.comb.value.sena, x=comp.comb.bw.sena)) +
geom_bar(position=position_dodge(), stat="identity")
graph.bw.comb.data.sena#this is the graph
# adding the labels to the graph
fill <- c("gold","turquoise2","hotpink2")
graph.bw.comb.data.sena+geom_text(aes(label =
paste(round((comp.bw.comb.value.sena),2),"%"),y=pos,size =
4),colour="black",fontface="bold",position = position_dodge(width =
```

0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title = element_blank()) + ggtitle("combination of bowlers and % results in SENA") + scale_fill_manual(values=fill)+labs(x = "BOWLING COMBINATION-->bw=total bowlers,sp=spinners,pa=pacers", y = "percentage of results")

#----------

#----------
#30.What is India’s overall record against test playing nations since 1 January, 2000 in ODI cricket?
#overall
```
australia.overall<-nrow(odidata[odidata$against.australia == "TRUE" ,])
australia.overall
australia.overall.win<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="won" ,])
australia.overall.win
australia.overall.lost<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
australia.overall.lost
australia.overall.tied<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
australia.overall.tied
bangladesh.overall<-nrow(odidata[odidata$against.bangladesh == "TRUE" ,])
bangladesh.overall
bangladesh.overall.win<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="won" ,])
bangladesh.overall.win
bangladesh.overall.lost<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
bangladesh.overall.lost
bangladesh.overall.tied<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
bangladesh.overall.tied
england.overall<-nrow(odidata[odidata$against.england == "TRUE" ,])
england.overall
england.overall.win<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="won" ,])
england.overall.win
england.overall.lost<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
england.overall.lost
england.overall.tied<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
```

```
england.overall.tied
newzealand.overall<-nrow(odidata[odidata$against.newzealand == "TRUE" ,])
newzealand.overall
newzealand.overall.win<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="won" ,])
newzealand.overall.win
newzealand.overall.lost<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
newzealand.overall.lost
newzealand.overall.tied<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
newzealand.overall.tied
pakistan.overall<-nrow(odidata[odidata$against.pakistan == "TRUE" ,])
pakistan.overall
pakistan.overall.win<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="won" ,])
pakistan.overall.win
pakistan.overall.lost<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
pakistan.overall.lost
pakistan.overall.tied<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
pakistan.overall.tied
southafrica.overall<-nrow(odidata[odidata$against.southafrica == "TRUE" ,])
southafrica.overall
southafrica.overall.win<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="won" ,])
southafrica.overall.win
southafrica.overall.lost<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
southafrica.overall.lost
southafrica.overall.tied<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
southafrica.overall.tied
srilanka.overall<-nrow(odidata[odidata$against.srilanka == "TRUE" ,])
srilanka.overall
srilanka.overall.win<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="won" ,])
srilanka.overall.win
srilanka.overall.lost<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
srilanka.overall.lost
srilanka.overall.tied<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
```

```
srilanka.overall.tied
westindies.overall<-nrow(odidata[odidata$against.westindies == "TRUE" ,])
westindies.overall
westindies.overall.win<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="won" ,])
westindies.overall.win
westindies.overall.lost<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
westindies.overall.lost
westindies.overall.tied<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
westindies.overall.tied
zimbabwe.overall<-nrow(odidata[odidata$against.zimbabwe == "TRUE" ,])
zimbabwe.overall
zimbabwe.overall.win<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="won" ,])
zimbabwe.overall.win
zimbabwe.overall.lost<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="lost" ,])
zimbabwe.overall.lost
zimbabwe.overall.tied<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="tied" ,])
zimbabwe.overall.tied
team<-
c("Australia","Australia","Australia","Australia","Bangladesh","Bangladesh","Bangladesh","Ban
gladesh","England","England","England","England","New Zealand","New Zealand","New
Zealand","New Zealand","Pakistan","Pakistan","Pakistan","Pakistan","South Africa","South
Africa","South Africa","South Africa","Sri Lanka","Sri Lanka","Sri Lanka","Sri Lanka","West
Indies","West Indies","West Indies","West
Indies","Zimbabwe","Zimbabwe","Zimbabwe","Zimbabwe")
team
match.stats<-
c("played","won","lost","tied","played","won","lost","tied","played","won","lost","tied","played"
,"won","lost","tied","played","won","lost","tied","played","won","lost","tied","played","won","lo
st","tied","played","won","lost","tied","played","won","lost","tied")
match.stats
value.match.stats<-
c(australia.overall,australia.overall.win,australia.overall.lost,australia.overall.tied,bangladesh.over
all,bangladesh.overall.win,bangladesh.overall.lost,bangladesh.overall.tied,england.overall,englan
d.overall.win,england.overall.lost,england.overall.tied,newzealand.overall,newzealand.overall.wi
n,newzealand.overall.lost,newzealand.overall.tied,pakistan.overall,pakistan.overall.win,pakistan.
overall.lost,pakistan.overall.tied,southafrica.overall,southafrica.overall.win,southafrica.overall.los
t,southafrica.overall.tied,srilanka.overall,srilanka.overall.win,srilanka.overall.lost,srilanka.overall
```

```
.tied,westindies.overall,westindies.overall.win,westindies.overall.lost,westindies.overall.tied,zimb
abwe.overall,zimbabwe.overall.win,zimbabwe.overall.lost,zimbabwe.overall.tied)
value.match.stats
india.vs.opp<-data.frame(team,match.stats,value.match.stats)
india.vs.opp

# creating the y-position for adding labels to the bars
india.vs.opp <- ddply(india.vs.opp, .(team),transform, pos =value.match.stats/2)
india.vs.opp
india.vs.opp$match.stats <- factor(india.vs.opp$match.stats, levels =
c("played","won","lost","tied"))
#creating the graph
graph.india.vs.opp<-ggplot(india.vs.opp, aes(fill=match.stats, y=value.match.stats, x=team)) +
geom_bar(position=position_dodge(), stat="identity")
graph.india.vs.opp#this is the graph
# adding the labels to the graph
fill <- c("gold","lawngreen","turquoise2","hotpink2")
graph.india.vs.opp+geom_text(aes(label = paste(value.match.stats),y=pos,size =
4),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle(" INDIA'S RECORD AGAINST TOP 10 TEST NATIONS  ") +
scale_fill_manual(values=fill)+labs(x = "TEAMS ", y = "VALUES")

#converting these into percentage value
aus.win<- australia.overall.win/australia.overall*100
aus.loss<-australia.overall.lost/australia.overall*100
aus.tie<-australia.overall.tied/australia.overall*100
ban.win<-bangladesh.overall.win/bangladesh.overall*100
ban.loss<-bangladesh.overall.lost/bangladesh.overall*100
ban.tie<-bangladesh.overall.tied/bangladesh.overall*100
eng.win<-england.overall.win/england.overall*100
eng.loss<-england.overall.lost/england.overall*100
eng.tie<-england.overall.tied/england.overall*100
nz.win<-newzealand.overall.win/newzealand.overall*100
nz.loss<-newzealand.overall.lost/newzealand.overall*100
nz.tie<-newzealand.overall.tied/newzealand.overall*100
pak.win<-pakistan.overall.win/pakistan.overall*100
pak.loss<-pakistan.overall.lost/pakistan.overall*100
pak.tie<-pakistan.overall.tied/pakistan.overall*100
sa.win<-southafrica.overall.win/southafrica.overall*100
sa.loss<-southafrica.overall.lost/southafrica.overall*100
sa.tie<-southafrica.overall.tied/southafrica.overall*100
slk.win<-srilanka.overall.win/srilanka.overall*100
slk.loss<-srilanka.overall.lost/srilanka.overall*100
```

```
slk.tie<-srilanka.overall.tied/srilanka.overall*100
wi.win<-westindies.overall.win/westindies.overall*100
wi.loss<-westindies.overall.lost/westindies.overall*100
wi.tie<-westindies.overall.tied/westindies.overall*100
zim.win<-zimbabwe.overall.win/zimbabwe.overall*100
zim.loss<-zimbabwe.overall.lost/zimbabwe.overall*100
zim.tie<-zimbabwe.overall.tied/zimbabwe.overall*100

per.opp.stats<-
c(aus.win,aus.loss,aus.tie,ban.win,ban.loss,ban.tie,eng.win,eng.loss,eng.tie,nz.win,nz.loss,nz.tie,p
ak.win,pak.loss,pak.tie,sa.win,sa.loss,sa.tie,slk.win,slk.loss,slk.tie,wi.win,wi.loss,wi.tie,zim.win,z
im.loss,zim.tie)
team.3<-
c("Australia","Australia","Australia","Bangladesh","Bangladesh","Bangladesh","England","Engl
and","England","New Zealand","New Zealand","New
Zealand","Pakistan","Pakistan","Pakistan","South Africa","South Africa","South Africa","Sri
Lanka","Sri Lanka","Sri Lanka","West Indies","West Indies","West
Indies","Zimbabwe","Zimbabwe","Zimbabwe")
team.3
match.stats.3<-
c("won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tie
d","won","lost","tied","won","lost","tied","won","lost","tied","won","lost","tied")
match.stats.3
india.vs.opp.per<-data.frame(team.3,match.stats.3,per.opp.stats)
india.vs.opp.per

# creating the y-position for adding labels to the bars
india.vs.opp.per <- ddply(india.vs.opp.per, .(team.3),transform, pos =cumsum(per.opp.stats)-
(0.5*per.opp.stats))
india.vs.opp.per
india.vs.opp.per$match.stats.3 <- factor(india.vs.opp.per$match.stats.3, levels =
c("tied","lost","won"))
#creating the graph
graph.india.vs.opp.per<-ggplot(india.vs.opp.per, aes(fill=match.stats.3, y=per.opp.stats,
x=team.3)) + geom_bar(position="fill", stat="identity")
graph.india.vs.opp.per#this is the graph
# adding the labels to the graph
fill <- c("gold","lawngreen","turquoise2")
graph.india.vs.opp.per+geom_text(aes(label = paste(round(per.opp.stats),2),y=pos,size =
4),colour="black",fontface="bold",position = "fill")+theme(legend.position="top",
legend.direction="horizontal", legend.title = element_blank()) + ggtitle(" INDIA'S RECORD IN
%s AGAINST TOP 10 TEST NATIONS  ") + scale_fill_manual(values=fill)+labs(x = "TEAMS
", y = "VALUES")
```

```
# at home
australia.overall.home<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$home=="TRUE" ,])
australia.overall.home
australia.overall.win.home<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="won" &odidata$home=="TRUE",])
australia.overall.win.home
australia.overall.lost.home<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$home=="TRUE" ,])
australia.overall.lost.home
australia.overall.tied.home<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$home=="TRUE" ,])
australia.overall.tied.home
bangladesh.overall.home<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$home=="TRUE" ,])
bangladesh.overall.home
bangladesh.overall.win.home<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$home=="TRUE"&odidata$home=="
TRUE" ,])
bangladesh.overall.win.home
bangladesh.overall.lost.home<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$home=="TRUE" ,])
bangladesh.overall.lost.home
bangladesh.overall.tied.home<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$home=="TRUE",])
bangladesh.overall.tied.home
england.overall.home<-nrow(odidata[odidata$against.england == "TRUE"
&odidata$home=="TRUE",])
england.overall.home
england.overall.win.home<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$home=="TRUE" ,])
england.overall.win.home
england.overall.lost.home<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$home=="TRUE" ,])
england.overall.lost.home
england.overall.tied.home<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$home=="TRUE" ,])
england.overall.tied.home
newzealand.overall.home<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$home=="TRUE" ,])
newzealand.overall.home
newzealand.overall.win.home<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$home=="TRUE" ,])
newzealand.overall.win.home
```

```
newzealand.overall.lost.home<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$home=="TRUE" ,])
newzealand.overall.lost.home
newzealand.overall.tied.home<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$home=="TRUE",])
newzealand.overall.tied.home
pakistan.overall.home<-nrow(odidata[odidata$against.pakistan == "TRUE"
&odidata$home=="TRUE",])
pakistan.overall.home
pakistan.overall.win.home<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="won" &odidata$home=="TRUE",])
pakistan.overall.win.home
pakistan.overall.lost.home<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="lost" &odidata$home=="TRUE",])
pakistan.overall.lost.home
pakistan.overall.tied.home<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$home=="TRUE" ,])
pakistan.overall.tied.home
southafrica.overall.home<-nrow(odidata[odidata$against.southafrica == "TRUE"
&odidata$home=="TRUE",])
southafrica.overall.home
southafrica.overall.win.home<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$home=="TRUE" ,])
southafrica.overall.win.home
southafrica.overall.lost.home<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$home=="TRUE" ,])
southafrica.overall.lost.home
southafrica.overall.tied.home<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$home=="TRUE",])
southafrica.overall.tied.home
srilanka.overall.home<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$home=="TRUE" ,])
srilanka.overall.home
srilanka.overall.win.home<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$home=="TRUE" ,])
srilanka.overall.win.home
srilanka.overall.lost.home<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$home=="TRUE" ,])
srilanka.overall.lost.home
srilanka.overall.tied.home<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$home=="TRUE" ,])
srilanka.overall.tied.home
westindies.overall.home<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$home=="TRUE" ,])
```

```
westindies.overall.home
westindies.overall.win.home<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$home=="TRUE" ,])
westindies.overall.win.home
westindies.overall.lost.home<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="lost" &odidata$home=="TRUE",])
westindies.overall.lost.home
westindies.overall.tied.home<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$home=="TRUE" ,])
westindies.overall.tied.home
zimbabwe.overall.home<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$home=="TRUE" ,])
zimbabwe.overall.home
zimbabwe.overall.win.home<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$home=="TRUE" ,])
zimbabwe.overall.win.home
zimbabwe.overall.lost.home<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$home=="TRUE" ,])
zimbabwe.overall.lost.home
zimbabwe.overall.tied.home<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$home=="TRUE" ,])
zimbabwe.overall.tied.home
team<-
c("Australia","Australia","Australia","Australia","Bangladesh","Bangladesh","Bangladesh","Ban
gladesh","England","England","England","England","New Zealand","New Zealand","New
Zealand","New Zealand","Pakistan","Pakistan","Pakistan","Pakistan","South Africa","South
Africa","South Africa","South Africa","Sri Lanka","Sri Lanka","Sri Lanka","Sri Lanka","West
Indies","West Indies","West Indies","West
Indies","Zimbabwe","Zimbabwe","Zimbabwe","Zimbabwe")
team
match.stats<-
c("played","won","lost","tied","played","won","lost","tied","played","won","lost","tied","played"
,"won","lost","tied","played","won","lost","tied","played","won","lost","tied","played","won","lo
st","tied","played","won","lost","tied","played","won","lost","tied")
match.stats
value.match.stats.home<-
c(australia.overall.home,australia.overall.win.home,australia.overall.lost.home,australia.overall.ti
ed.home,bangladesh.overall.home,bangladesh.overall.win.home,bangladesh.overall.lost.home,ba
ngladesh.overall.tied.home,england.overall.home,england.overall.win.home,england.overall.lost.
home,england.overall.tied.home,newzealand.overall.home,newzealand.overall.win.home,newzeal
and.overall.lost.home,newzealand.overall.tied.home,pakistan.overall.home,pakistan.overall.win.h
ome,pakistan.overall.lost.home,pakistan.overall.tied.home,southafrica.overall.home,southafrica.o
verall.win.home,southafrica.overall.lost.home,southafrica.overall.tied.home,srilanka.overall.hom
e,srilanka.overall.win.home,srilanka.overall.lost.home,srilanka.overall.tied.home,westindies.over
```

```
all.home,westindies.overall.win.home,westindies.overall.lost.home,westindies.overall.tied.home,
zimbabwe.overall.home,zimbabwe.overall.win.home,zimbabwe.overall.lost.home,zimbabwe.over
all.tied.home)
value.match.stats.home
india.vs.opp.home<-data.frame(team,match.stats,value.match.stats.home)
india.vs.opp.home

# creating the y-position for adding labels to the bars
india.vs.opp.home <- ddply(india.vs.opp.home, .(team),transform, pos
=value.match.stats.home/2)
india.vs.opp.home
india.vs.opp.home$match.stats <- factor(india.vs.opp.home$match.stats, levels =
c("played","won","lost","tied"))
#creating the graph
graph.india.vs.opp.home<-ggplot(india.vs.opp.home, aes(fill=match.stats,
y=value.match.stats.home, x=team)) + geom_bar(position=position_dodge(), stat="identity")
graph.india.vs.opp.home#this is the graph
# adding the labels to the graph
fill <- c("gold","lawngreen","turquoise2","hotpink2")
graph.india.vs.opp.home+geom_text(aes(label = paste(value.match.stats.home),y=pos,size =
4),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle(" INDIA'S RECORD AGAINST TOP 10 TEST NATIONS AT
HOME ") + scale_fill_manual(values=fill)+labs(x = "TEAMS ", y = "VALUES")


#1.      What is India’s away record against test playing nations since 1 January, 2000 in ODI
cricket?
australia.overall.away<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$away=="TRUE" ,])
australia.overall.away
australia.overall.win.away<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="won" &odidata$away=="TRUE",])
australia.overall.win.away
australia.overall.lost.away<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$away=="TRUE" ,])
australia.overall.lost.away
australia.overall.tied.away<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$away=="TRUE" ,])
australia.overall.tied.away
bangladesh.overall.away<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$away=="TRUE" ,])
bangladesh.overall.away
```

```
bangladesh.overall.win.away<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$away=="TRUE"&odidata$away=="
TRUE" ,])
bangladesh.overall.win.away
bangladesh.overall.lost.away<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$away=="TRUE" ,])
bangladesh.overall.lost.away
bangladesh.overall.tied.away<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$away=="TRUE",])
bangladesh.overall.tied.away
england.overall.away<-nrow(odidata[odidata$against.england == "TRUE"
&odidata$away=="TRUE",])
england.overall.away
england.overall.win.away<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$away=="TRUE" ,])
england.overall.win.away
england.overall.lost.away<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$away=="TRUE" ,])
england.overall.lost.away
england.overall.tied.away<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$away=="TRUE" ,])
england.overall.tied.away
newzealand.overall.away<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$away=="TRUE" ,])
newzealand.overall.away
newzealand.overall.win.away<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$away=="TRUE" ,])
newzealand.overall.win.away
newzealand.overall.lost.away<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$away=="TRUE" ,])
newzealand.overall.lost.away
newzealand.overall.tied.away<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$away=="TRUE",])
newzealand.overall.tied.away
pakistan.overall.away<-nrow(odidata[odidata$against.pakistan == "TRUE"
&odidata$away=="TRUE",])
pakistan.overall.away
pakistan.overall.win.away<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="won" &odidata$away=="TRUE",])
pakistan.overall.win.away
pakistan.overall.lost.away<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="lost" &odidata$away=="TRUE",])
pakistan.overall.lost.away
```

```
pakistan.overall.tied.away<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$away=="TRUE" ,])
pakistan.overall.tied.away
southafrica.overall.away<-nrow(odidata[odidata$against.southafrica == "TRUE"
&odidata$away=="TRUE",])
southafrica.overall.away
southafrica.overall.win.away<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$away=="TRUE" ,])
southafrica.overall.win.away
southafrica.overall.lost.away<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$away=="TRUE" ,])
southafrica.overall.lost.away
southafrica.overall.tied.away<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$away=="TRUE",])
southafrica.overall.tied.away
srilanka.overall.away<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$away=="TRUE" ,])
srilanka.overall.away
srilanka.overall.win.away<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$away=="TRUE" ,])
srilanka.overall.win.away
srilanka.overall.lost.away<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$away=="TRUE" ,])
srilanka.overall.lost.away
srilanka.overall.tied.away<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$away=="TRUE" ,])
srilanka.overall.tied.away
westindies.overall.away<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$away=="TRUE" ,])
westindies.overall.away
westindies.overall.win.away<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$away=="TRUE" ,])
westindies.overall.win.away
westindies.overall.lost.away<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="lost" &odidata$away=="TRUE",])
westindies.overall.lost.away
westindies.overall.tied.away<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$away=="TRUE" ,])
westindies.overall.tied.away
zimbabwe.overall.away<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$away=="TRUE" ,])
zimbabwe.overall.away
zimbabwe.overall.win.away<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$away=="TRUE" ,])
```

```
zimbabwe.overall.win.away
zimbabwe.overall.lost.away<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$away=="TRUE" ,])
zimbabwe.overall.lost.away
zimbabwe.overall.tied.away<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$away=="TRUE" ,])
zimbabwe.overall.tied.away

team<-
c("Australia","Australia","Australia","Australia","Bangladesh","Bangladesh","Bangladesh","Ban
gladesh","England","England","England","England","New Zealand","New Zealand","New
Zealand","New Zealand","Pakistan","Pakistan","Pakistan","Pakistan","South Africa","South
Africa","South Africa","South Africa","Sri Lanka","Sri Lanka","Sri Lanka","Sri Lanka","West
Indies","West Indies","West Indies","West
Indies","Zimbabwe","Zimbabwe","Zimbabwe","Zimbabwe")
team
match.stats<-
c("played","won","lost","tied","played","won","lost","tied","played","won","lost","tied","played"
,"won","lost","tied","played","won","lost","tied","played","won","lost","tied","played","won","lo
st","tied","played","won","lost","tied","played","won","lost","tied")
match.stats
value.match.stats.away<-
c(australia.overall.away,australia.overall.win.away,australia.overall.lost.away,australia.overall.tie
d.away,bangladesh.overall.away,bangladesh.overall.win.away,bangladesh.overall.lost.away,bangl
adesh.overall.tied.away,england.overall.away,england.overall.win.away,england.overall.lost.awa
y,england.overall.tied.away,newzealand.overall.away,newzealand.overall.win.away,newzealand.
overall.lost.away,newzealand.overall.tied.away,pakistan.overall.away,pakistan.overall.win.away,
pakistan.overall.lost.away,pakistan.overall.tied.away,southafrica.overall.away,southafrica.overall.
win.away,southafrica.overall.lost.away,southafrica.overall.tied.away,srilanka.overall.away,srilan
ka.overall.win.away,srilanka.overall.lost.away,srilanka.overall.tied.away,westindies.overall.away
,westindies.overall.win.away,westindies.overall.lost.away,westindies.overall.tied.away,zimbabwe
.overall.away,zimbabwe.overall.win.away,zimbabwe.overall.lost.away,zimbabwe.overall.tied.aw
ay)
value.match.stats.away
india.vs.opp.away<-data.frame(team,match.stats,value.match.stats.away)
india.vs.opp.away

# creating the y-position for adding labels to the bars
india.vs.opp.away <- ddply(india.vs.opp.away, .(team),transform, pos =value.match.stats.away/2)
india.vs.opp.away
india.vs.opp.away$match.stats <- factor(india.vs.opp.away$match.stats, levels =
c("played","won","lost","tied"))
#creating the graph
```

```
graph.india.vs.opp.away<-ggplot(india.vs.opp.away, aes(fill=match.stats,
y=value.match.stats.away, x=team)) + geom_bar(position=position_dodge(), stat="identity")
graph.india.vs.opp.away#this is the graph
# adding the labels to the graph
fill <- c("gold","lawngreen","turquoise2","hotpink2")
graph.india.vs.opp.away+geom_text(aes(label = paste(value.match.stats.away),y=pos,size =
4),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle(" INDIA'S RECORD AGAINST TOP 10 TEST NATIONS AT
AWAY ") + scale_fill_manual(values=fill)+labs(x = "TEAMS ", y = "VALUES")

#at neutral

#1.      What is India’s neutral record against test playing nations since 1 January, 2000 in ODI
cricket?
australia.overall.neutral<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$neutral=="TRUE" ,])
australia.overall.neutral
australia.overall.win.neutral<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="won" &odidata$neutral=="TRUE",])
australia.overall.win.neutral
australia.overall.lost.neutral<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$neutral=="TRUE" ,])
australia.overall.lost.neutral
australia.overall.tied.neutral<-nrow(odidata[odidata$against.australia ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$neutral=="TRUE" ,])
australia.overall.tied.neutral
bangladesh.overall.neutral<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$neutral=="TRUE" ,])
bangladesh.overall.neutral
bangladesh.overall.win.neutral<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$neutral=="TRUE"&odidata$neutral=
="TRUE" ,])
bangladesh.overall.win.neutral
bangladesh.overall.lost.neutral<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$neutral=="TRUE" ,])
bangladesh.overall.lost.neutral
bangladesh.overall.tied.neutral<-nrow(odidata[odidata$against.bangladesh ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$neutral=="TRUE",])
bangladesh.overall.tied.neutral
england.overall.neutral<-nrow(odidata[odidata$against.england == "TRUE"
&odidata$neutral=="TRUE",])
england.overall.neutral
```

```
england.overall.win.neutral<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$neutral=="TRUE" ,])
england.overall.win.neutral
england.overall.lost.neutral<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$neutral=="TRUE" ,])
england.overall.lost.neutral
england.overall.tied.neutral<-nrow(odidata[odidata$against.england ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$neutral=="TRUE" ,])
england.overall.tied.neutral
newzealand.overall.neutral<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$neutral=="TRUE" ,])
newzealand.overall.neutral
newzealand.overall.win.neutral<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$neutral=="TRUE" ,])
newzealand.overall.win.neutral
newzealand.overall.lost.neutral<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$neutral=="TRUE" ,])
newzealand.overall.lost.neutral
newzealand.overall.tied.neutral<-nrow(odidata[odidata$against.newzealand ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$neutral=="TRUE",])
newzealand.overall.tied.neutral
pakistan.overall.neutral<-nrow(odidata[odidata$against.pakistan == "TRUE"
&odidata$neutral=="TRUE",])
pakistan.overall.neutral
pakistan.overall.win.neutral<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="won" &odidata$neutral=="TRUE",])
pakistan.overall.win.neutral
pakistan.overall.lost.neutral<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="lost" &odidata$neutral=="TRUE",])
pakistan.overall.lost.neutral
pakistan.overall.tied.neutral<-nrow(odidata[odidata$against.pakistan ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$neutral=="TRUE" ,])
pakistan.overall.tied.neutral
southafrica.overall.neutral<-nrow(odidata[odidata$against.southafrica == "TRUE"
&odidata$neutral=="TRUE",])
southafrica.overall.neutral
southafrica.overall.win.neutral<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$neutral=="TRUE" ,])
southafrica.overall.win.neutral
southafrica.overall.lost.neutral<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$neutral=="TRUE" ,])
southafrica.overall.lost.neutral
southafrica.overall.tied.neutral<-nrow(odidata[odidata$against.southafrica ==
"TRUE"&odidata$match.result.for.india=="tied" &odidata$neutral=="TRUE",])
```

```
southafrica.overall.tied.neutral
srilanka.overall.neutral<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$neutral=="TRUE" ,])
srilanka.overall.neutral
srilanka.overall.win.neutral<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$neutral=="TRUE" ,])
srilanka.overall.win.neutral
srilanka.overall.lost.neutral<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$neutral=="TRUE" ,])
srilanka.overall.lost.neutral
srilanka.overall.tied.neutral<-nrow(odidata[odidata$against.srilanka ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$neutral=="TRUE" ,])
srilanka.overall.tied.neutral
westindies.overall.neutral<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$neutral=="TRUE" ,])
westindies.overall.neutral
westindies.overall.win.neutral<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$neutral=="TRUE" ,])
westindies.overall.win.neutral
westindies.overall.lost.neutral<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="lost" &odidata$neutral=="TRUE",])
westindies.overall.lost.neutral
westindies.overall.tied.neutral<-nrow(odidata[odidata$against.westindies ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$neutral=="TRUE" ,])
westindies.overall.tied.neutral
zimbabwe.overall.neutral<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$neutral=="TRUE" ,])
zimbabwe.overall.neutral
zimbabwe.overall.win.neutral<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="won"&odidata$neutral=="TRUE" ,])
zimbabwe.overall.win.neutral
zimbabwe.overall.lost.neutral<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="lost"&odidata$neutral=="TRUE" ,])
zimbabwe.overall.lost.neutral
zimbabwe.overall.tied.neutral<-nrow(odidata[odidata$against.zimbabwe ==
"TRUE"&odidata$match.result.for.india=="tied"&odidata$neutral=="TRUE" ,])
zimbabwe.overall.tied.neutral

team<-
c("Australia","Australia","Australia","Australia","Bangladesh","Bangladesh","Bangladesh","Ban
gladesh","England","England","England","England","New Zealand","New Zealand","New
Zealand","New Zealand","Pakistan","Pakistan","Pakistan","Pakistan","South Africa","South
Africa","South Africa","South Africa","Sri Lanka","Sri Lanka","Sri Lanka","Sri Lanka","West
```

```
Indies","West Indies","West Indies","West
Indies","Zimbabwe","Zimbabwe","Zimbabwe","Zimbabwe")
team
match.stats<-
c("played","won","lost","tied","played","won","lost","tied","played","won","lost","tied","played"
,"won","lost","tied","played","won","lost","tied","played","won","lost","tied","played","won","lo
st","tied","played","won","lost","tied","played","won","lost","tied")
match.stats
value.match.stats.neutral<-
c(australia.overall.neutral,australia.overall.win.neutral,australia.overall.lost.neutral,australia.overa
ll.tied.neutral,bangladesh.overall.neutral,bangladesh.overall.win.neutral,bangladesh.overall.lost.n
eutral,bangladesh.overall.tied.neutral,england.overall.neutral,england.overall.win.neutral,england.
overall.lost.neutral,england.overall.tied.neutral,newzealand.overall.neutral,newzealand.overall.wi
n.neutral,newzealand.overall.lost.neutral,newzealand.overall.tied.neutral,pakistan.overall.neutral,
pakistan.overall.win.neutral,pakistan.overall.lost.neutral,pakistan.overall.tied.neutral,southafrica.
overall.neutral,southafrica.overall.win.neutral,southafrica.overall.lost.neutral,southafrica.overall.t
ied.neutral,srilanka.overall.neutral,srilanka.overall.win.neutral,srilanka.overall.lost.neutral,srilank
a.overall.tied.neutral,westindies.overall.neutral,westindies.overall.win.neutral,westindies.overall.l
ost.neutral,westindies.overall.tied.neutral,zimbabwe.overall.neutral,zimbabwe.overall.win.neutral
,zimbabwe.overall.lost.neutral,zimbabwe.overall.tied.neutral)
value.match.stats.neutral
india.vs.opp.neutral<-data.frame(team,match.stats,value.match.stats.neutral)
india.vs.opp.neutral

# creating the y-position for adding labels to the bars
india.vs.opp.neutral <- ddply(india.vs.opp.neutral, .(team),transform, pos
=value.match.stats.neutral/2)
india.vs.opp.neutral
india.vs.opp.neutral$match.stats <- factor(india.vs.opp.neutral$match.stats, levels =
c("played","won","lost","tied"))
#creating the graph
graph.india.vs.opp.neutral<-ggplot(india.vs.opp.neutral, aes(fill=match.stats,
y=value.match.stats.neutral, x=team)) + geom_bar(position=position_dodge(), stat="identity")
graph.india.vs.opp.neutral#this is the graph
# adding the labels to the graph
fill <- c("gold","lawngreen","turquoise2","hotpink2")
graph.india.vs.opp.neutral+geom_text(aes(label = paste(value.match.stats.neutral),y=pos,size =
4),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle(" INDIA'S RECORD AGAINST TOP 10 TEST NATIONS AT
NEUTRAL ") + scale_fill_manual(values=fill)+labs(x = "TEAMS ", y = "VALUES")

# effect of 100s by indian batsmen
```

```
win100<-
nrow(odidata[odidata$no.of.100.s..by.indian.batsmen&odidata$match.result.for.india=="won",])
win100
loss100<-
nrow(odidata[odidata$no.of.100.s..by.indian.batsmen&odidata$match.result.for.india=="lost",])
loss100
tie100<-
nrow(odidata[odidata$no.of.100.s..by.indian.batsmen&odidata$match.result.for.india=="tied",])
tie100
count100<-nrow(odidata[odidata$no.of.100.s..by.indian.batsmen,])
count100
per100win<-win100/count100*100
per100loss<-loss100/count100*100
per100tie<-tie100/count100*100
res.type.100<-c("won","lost","tied")
val.type.100<-c(per100win,per100loss,per100tie)
data.100.res<-data.frame(res.type.100,val.type.100)
graph.data.100.res<-ggplot(data.100.res, aes(fill=res.type.100, y=val.type.100, x=res.type.100)) +
geom_bar(position=position_dodge(), stat="identity")+geom_text(aes(label =
paste(round((val.type.100),2),"%"),y=pos,size = 4),colour="black",fontface="bold",position =
position_dodge(width = 0.9))+theme(legend.position="top", legend.direction="horizontal",
legend.title = element_blank()) + ggtitle(" INDIA'S RECORD WHEN INDIAN BATSMEN
SCORE 100(S)") + scale_fill_manual(values=fill)+labs(x = "TEAMS ", y = "VALUES")
graph.data.100.res

# effect of 100s by indian batsmen
win100.chase<-
nrow(odidata[odidata$no.of.100.s..by.indian.batsmen&odidata$match.result.for.india=="won"&o
didata$batting.turn=="2nd",])
win100.chase
loss100.chase<-
nrow(odidata[odidata$no.of.100.s..by.indian.batsmen&odidata$match.result.for.india=="lost"&o
didata$batting.turn=="2nd",])
tie100.chase<-
nrow(odidata[odidata$no.of.100.s..by.indian.batsmen&odidata$match.result.for.india=="tied"&o
didata$batting.turn=="2nd",])
loss100.chase
count100.chase<-
nrow(odidata[odidata$no.of.100.s..by.indian.batsmen&odidata$batting.turn=="2nd",])
count100.chase
per100win.chase<-win100.chase/count100.chase*100
per100loss.chase<-loss100.chase/count100.chase*100
per100tie.chase<-tie100.chase/count100.chase*100
res.type.100<-c("won","lost","tied")
```

```
val.type.100.chase<-c(per100win.chase,per100loss.chase,per100tie.chase)
data.100.res.chase<-data.frame(res.type.100,val.type.100.chase)
graph.data.100.res.chase<-ggplot(data.100.res.chase, aes(fill=res.type.100, y=val.type.100.chase,
x=res.type.100)) + geom_bar(position=position_dodge(), stat="identity")+geom_text(aes(label =
paste(round((val.type.100.chase),2),"%"),y=val.type.100.chase/2,size =
4),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle(" INDIA'S RECORD CHASING WHEN INDIAN BATSMEN
SCORE 100(S)") + scale_fill_manual(values=fill)+labs(x = "TEAMS ", y = "VALUES")
graph.data.100.res.chase

#------------------------------------------------------------------------
wk5.no<-nrow(odidata[odidata$indian.bowler.taking.5..wicket=="TRUE",])
WK5.win.no<-
nrow(odidata[odidata$indian.bowler.taking.5..wicket=="TRUE"&odidata$match.result.for.india
=="won",])
wk5.loss.no<-
nrow(odidata[odidata$indian.bowler.taking.5..wicket=="TRUE"&odidata$match.result.for.india
=="lost",])
wk5.tie.no<-
nrow(odidata[odidata$indian.bowler.taking.5..wicket=="TRUE"&odidata$match.result.for.india
=="tied",])
wk5.no
WK5.win.no
wk5.loss.no
wk5.tie.no
per.WK5.win.no<-WK5.win.no/wk5.no*100
per.wk5.loss.no<-wk5.loss.no/wk5.no*100
per.wk5.tie.no<-wk5.tie.no/wk5.no*100

def.wk5.no<-
nrow(odidata[odidata$indian.bowler.taking.5..wicket=="TRUE"&odidata$batting.turn=="2nd",])
def.WK5.win.no<-
nrow(odidata[odidata$indian.bowler.taking.5..wicket=="TRUE"&odidata$match.result.for.india
=="won"&odidata$batting.turn=="2nd",])
def.wk5.loss.no<-
nrow(odidata[odidata$indian.bowler.taking.5..wicket=="TRUE"&odidata$match.result.for.india
=="lost"&odidata$batting.turn=="2nd",])
def.wk5.tie.no<-
nrow(odidata[odidata$indian.bowler.taking.5..wicket=="TRUE"&odidata$match.result.for.india
=="tied"&odidata$batting.turn=="2nd",])
def.wk5.no
def.WK5.win.no
def.wk5.loss.no
```

```
def.wk5.tie.no

per.def.WK5.win.no<-def.WK5.win.no/def.wk5.no*100
per.def.wk5.loss.no<-def.wk5.loss.no/def.wk5.no*100
per.def.wk5.tie.no<-def.wk5.tie.no/def.wk5.no*100

# effect of 5+ wicktes by indian bowlers
res.type.5<-c("won","lost","tied")
val.type.5<-c(per.WK5.win.no,per.wk5.loss.no,per.wk5.tie.no)
data.5.res<-data.frame(res.type.5,val.type.5)
graph.data.5.res<-ggplot(data.5.res, aes(fill=res.type.5, y=val.type.5, x=res.type.5)) +
geom_bar(position=position_dodge(), stat="identity")+geom_text(aes(label =
paste(round((val.type.5),2),"%"),y=val.type.5/2,size =
4),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle(" INDIA'S RECORD WHEN INDIAN BOWLER TAKES 5+
WICKETS") + scale_fill_manual(values=fill)+labs(x = "TEAMS ", y = "VALUES")
graph.data.5.res

# effect of 5+ wicktes by indian bowlers while defending
res.type.5<-c("won","lost","tied")
val.type.5.def<-c(per.def.WK5.win.no,per.def.wk5.loss.no,per.def.wk5.tie.no)
data.5.res.def<-data.frame(res.type.5,val.type.5.def)
graph.data.5.res.def<-ggplot(data.5.res.def, aes(fill=res.type.5, y=val.type.5.def, x=res.type.5)) +
geom_bar(position=position_dodge(), stat="identity")+geom_text(aes(label =
paste(round((val.type.5.def),2),"%"),y=val.type.5.def/2,size =
4),colour="black",fontface="bold",position = position_dodge(width =
0.9))+theme(legend.position="top", legend.direction="horizontal", legend.title =
element_blank()) + ggtitle(" INDIA'S RECORD DEFENDING WHEN INDIAN BOWLER
TAKES 5+ WICKETS") + scale_fill_manual(values=fill)+labs(x = "TEAMS ", y = "VALUES")
graph.data.5.res.def
```