STAT-515 Midterm Project

Redesign Table

Introduction

In our project, we decided to redesign a table. We have chosen official Premier League website as our main source of data. This website contains various statistics of different seasons and all the teams which participated in those seasons. There are multiple ways to depict the data. We have chosen the following scenarios to analyze the data:

1. Multiple teams in a single season
2. Single team in multiple seasons

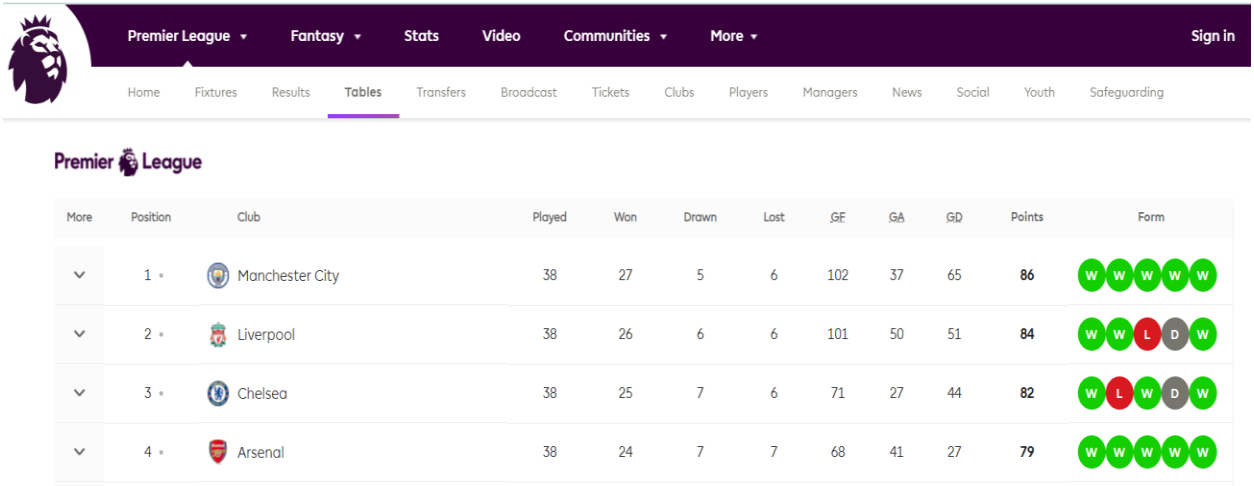
Multiple teams in a single season: We considered season 13/14 for this case. It was an intriguing season, as the points difference between the top four were teams was just two points and all the four teams played equally well. It would be interesting to know the statistics behind that season and analyze each team's performance with visual representation.

Single team in multiple seasons: In this scenario, we chose to analyze team Liverpool's performance of past six seasons. Liverpool had a rapid growth in terms of performance in the past six seasons. Digging deeper into the statistical data of past six seasons might reveal some interesting facts about the team's performance.

For this redesign, we will begin examining and commenting on strengths and weaknesses of the available data tables. Further, trying to accommodate the data into appropriate categorized tables in such a manner that are suitable for visual representation. We conclude by proving insights that are obtained from the plotted graph.

Table Discussion

The source of tables is from the official website of Premier League. We have considered only the top four teams, as shown in *Figure 1*.



More	Position	Club	Played	Won	Drawn	Lost	GF	GA	GD	Points	Form
	1	Manchester City	38	27	5	6	102	37	65	86	W W W W W
	2	Liverpool	38	26	6	6	101	50	51	84	W W L D W
	3	Chelsea	38	25	7	6	71	27	44	82	W L W D W
	4	Arsenal	38	24	7	7	68	41	27	79	W W W W W

Figure 1: Top four teams of Season 13/14

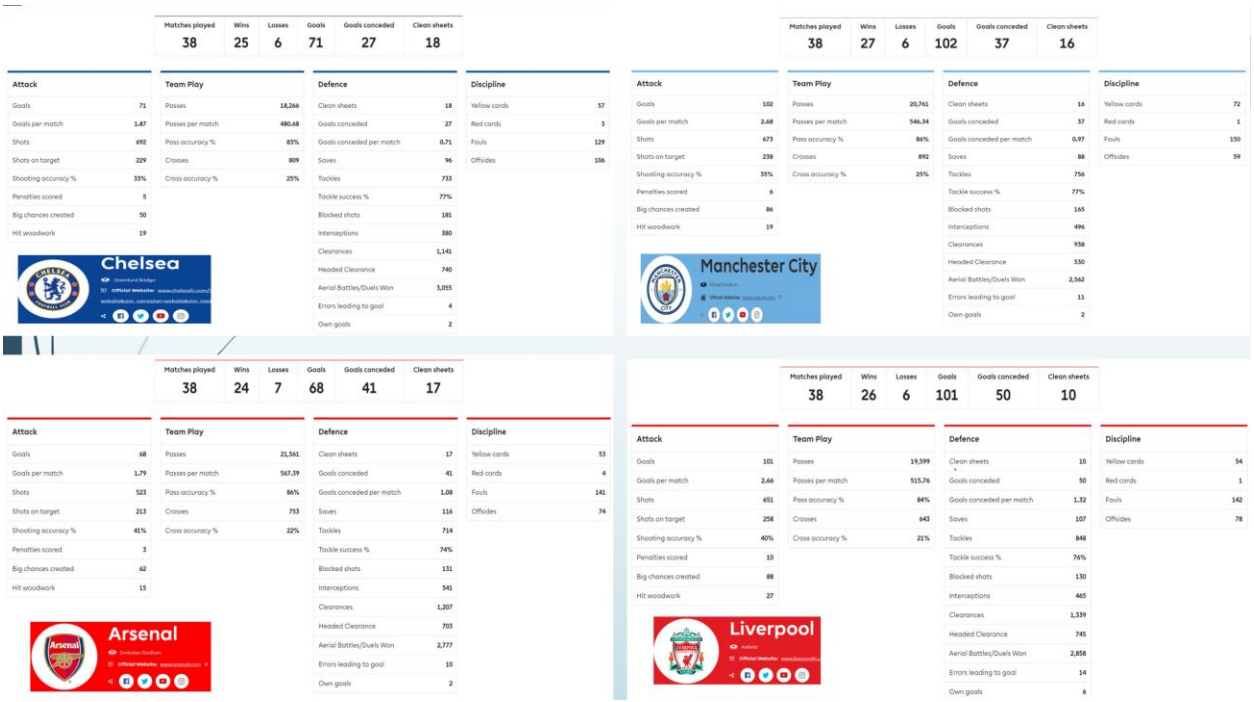


Figure 2: Statistics of top four teams of Season 13/14

Figure 2 shows various statistical data of the top four teams. There are four different columns for each team, which are categorized based on two factors that are attack and defense.

***Strengths and Weaknesses*:** The titles of these tables are very clear and self-explanatory, which makes it very simple for anyone to understand the table. Captions of the table are precise to describe about each column. All the statistical data are clearly categorized into tables. However, it is very difficult to compare stats between tables, as there are many parameters involved.

Redesigned Table

In this section, we extracted the data from tables shown in *Figure 2* and redesigned them into two different tables. The extraction of data is done in such a way that the tables are classified as attack and defense.

Table 1 contains all the parameters which represent attacking statistics of the top four teams in the season 13/14. Whereas, *Table 2* represents all the parameters which represent defensive statistics of the top four teams in the season 13/14.

Table 1: Attack stats of top 4 teams of season 13/14

Sno.	Team Names	Goals	Goals per match	Shots	Shots on target	Shooting accuracy in %	Big chances created	Hot woodwork	Passes	Passes per match	Pass accuracy in %
1	Manchester City	102	2.68	673	238	35	86	19	20761	546.34	86
2	Liverpool	101	2.66	651	258	40	88	27	19599	515.76	84
3	Chelsea	71	1.87	692	229	33	50	19	18266	480.68	83
4	Arsenal	68	1.79	523	213	41	62	15	21561	567.39	86

Table 2: Defense stats of top 4 teams of season 13/14

Sno.	Team Names	Clean sheets	Goals conceded	Goals conceded per match	Saves	Tackles	Sucessful tackles	Tackle success %	Interceptions	Clearances	Headed clearance	Aerial battle/Duels won	Error leading to goal	Own goals
1	Manchester City	16	37	0.97	88	756	582	77	496	938	530	2562	11	2
2	Liverpool	10	50	1.32	107	848	644	76	465	1339	745	2858	14	6
3	Chelsea	18	27	0.71	96	733	564	77	380	1141	740	3055	4	2
4	Arsenal	17	41	1.08	116	714	528	74	541	1207	703	2777	10	2

The main objective of the above two tables is to make the statistically comparison of the teams and to provide insights of the team's performance for the whole season.

Using Tableau, we have plotted simple bar graphs for the *Table 1* which is shown in the *Figure 2* and *Figure 3.* In x-axis, count of individual attack parameters is considered, whereas y-axis represents both team names and attack parameters. The colors used to plot graph are color-blind friendly.

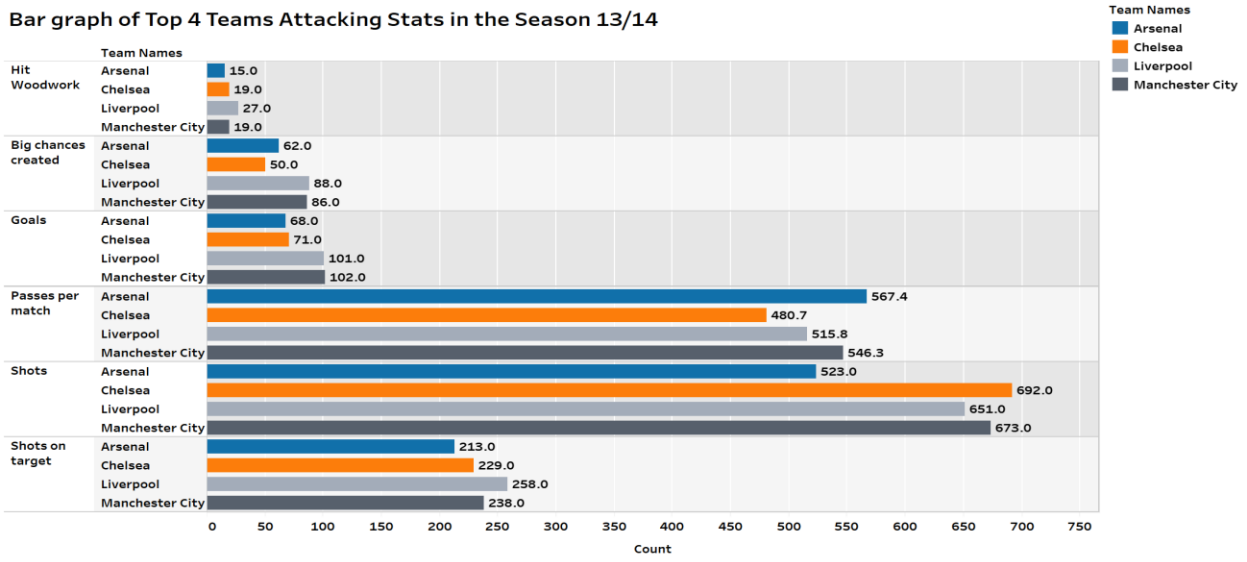


Figure 3

In *Figure 3,* we can clearly observe that Manchester city and Liverpool have created a greater number of chances of scoring a goal than Chelsea and Arsenal. Manchester city and Liverpool have scored almost the same number of goals which are significantly more than the other two teams.

Also, we can point out from *Figure 4* that all the teams performed equally well in terms of accuracy. In this graph, x-axis represents team names and two attack parameters, y-axis represents percentage of pass accuracy and shooting accuracy.

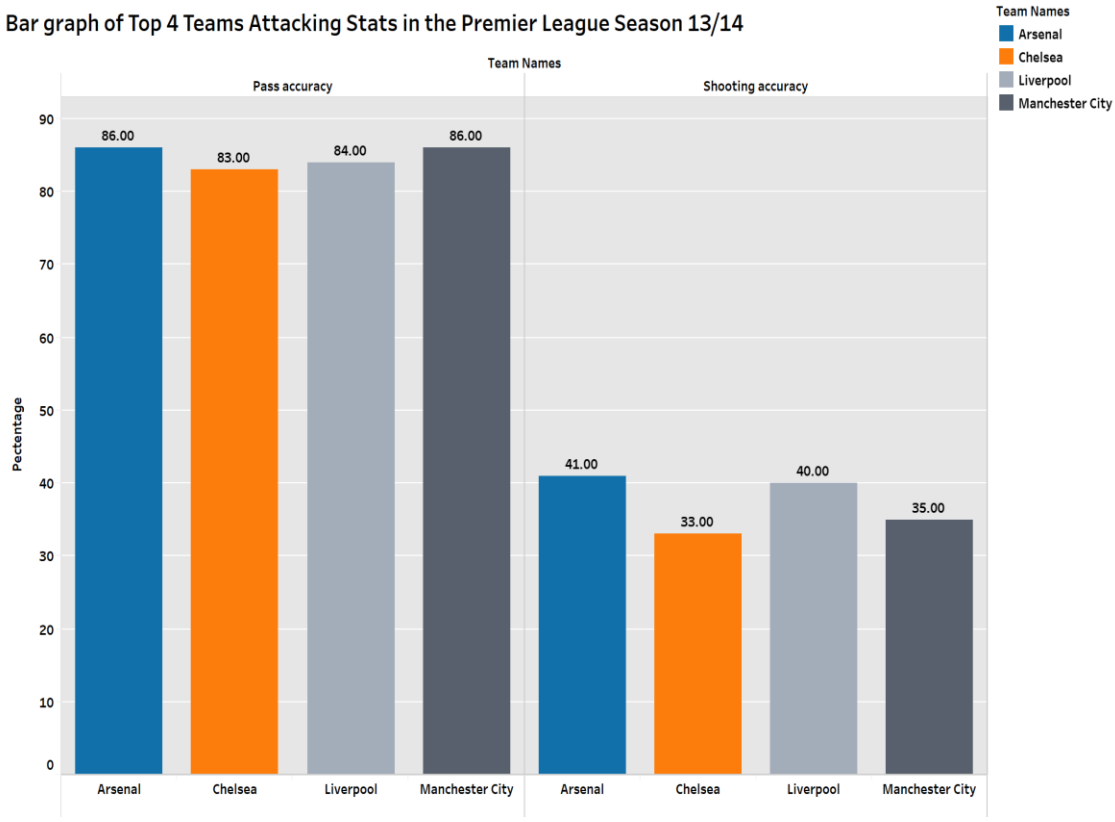


Figure 4

Figure 5 and *Figure 6* represents simple bar graph defensive stats for the *Table 2*. Almost all these four

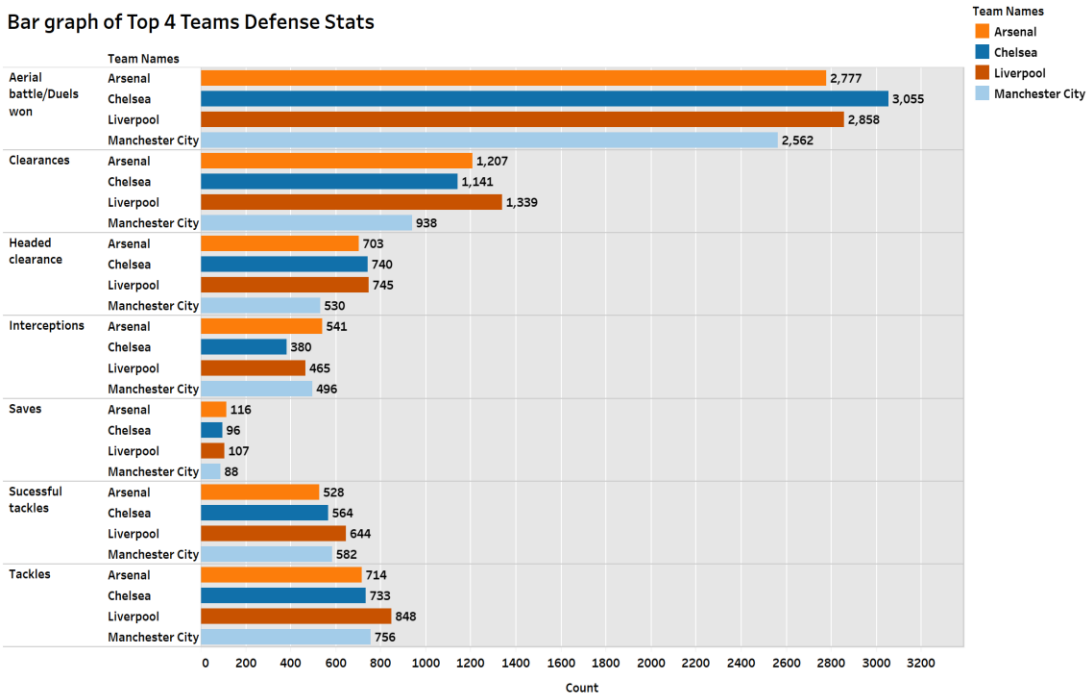


Figure 5

teams have the same numbers statistically, which we can observe in *Figure 5*. X-axis and y-axis of graphs shown in *Figure 5* represents count of defense parameters and team names along with defense parameters respectively. Colors used here are color-blind friendly.

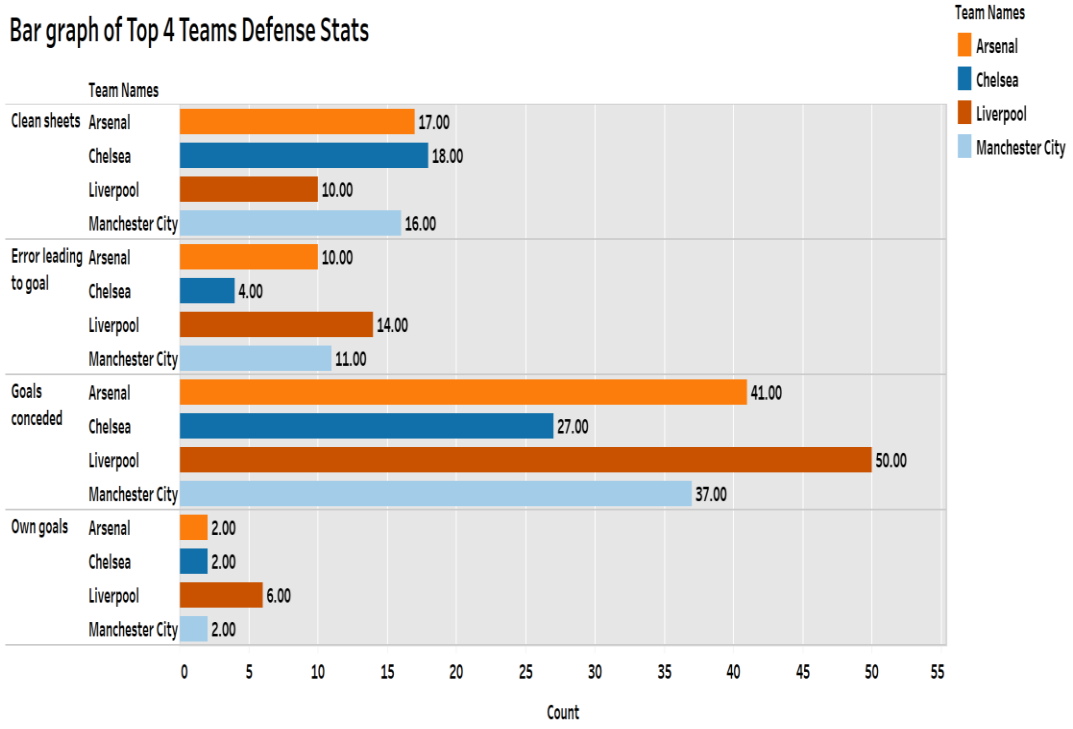


Figure 6

Figure 6 contains parameters which are the major deciding factors to get placed at the top of the points table. X-axis of graph has count value and y-axis shows defense parameters and team names. Colors used in plotting graph are color-blind friendly. Chelsea has the highest number of clean sheets and the least number of errors leading to goals. But they couldn't perform well in the attacking department. As a result, they came third in the points table. Whereas, Liverpool has performed poorly in defensive department, as we can see that it has least number of clean sheets, highest number of errors and conceded highest number of goals than any other team. That is where they lost the season.

Considering another scenario which illustrates data collected for team Liverpool of past six seasons. The objective of this is to compare the overall team performance throughout these seasons. Similarly, we have categorized tables into two different sections as attack and defense.

Table 3: Liverpool attack stats

Seasons	Goals	Goals per match	Shots	Shots on target	Shooting accuracy in %	Big chances created	Hit woodwork	Passes	Passes per match	Pass accuracy in %
13/14	101	2.66	651	258	40	88	27	19599	515.76	84
14/15	52	1.37	590	192	33	38	12	19374	509.84	83
15/16	63	1.66	629	202	32	56	16	19733	519.29	80
16/17	78	2.05	640	236	37	52	18	22290	586.58	82
17/18	84	2.21	638	233	37	78	16	22962	604.26	84
18/19	89	2.28	575	226	39	78	19	23638	606.1	84

Table 4: Liverpool defense stats

Seasons	Clean sheets	Goals conceded	Goals conceded per match	Saves	Tackles	Successful Tackles	Tackle success %	Interceptions	Clearances	Headed clearance	Aerial battle/Duels won	Error leading to goal	Own goals
13/14	10	50	1.32	107	848	644	76	465	1339	745	2858	14	6
14/15	14	48	1.26	93	798	614	77	442	1175	628	2817	9	2
15/16	11	50	1.32	81	871	679	78	549	871	342	2819	11	1
16/17	12	42	1.11	73	719	510	71	410	877	437	2810	10	0
17/18	17	38	1	67	637	452	71	379	736	362	2565	4	0
18/19	21	22	0.56	76	610	372	61	314	639	317	2518	4	0

Table 3 and *Table 4* are the redesigned tables which represent attacking and defensive stats of team Liverpool respectively. These statistics are essential to analyze the performance of the team. With the help of Tableau, we have visually represented the data.

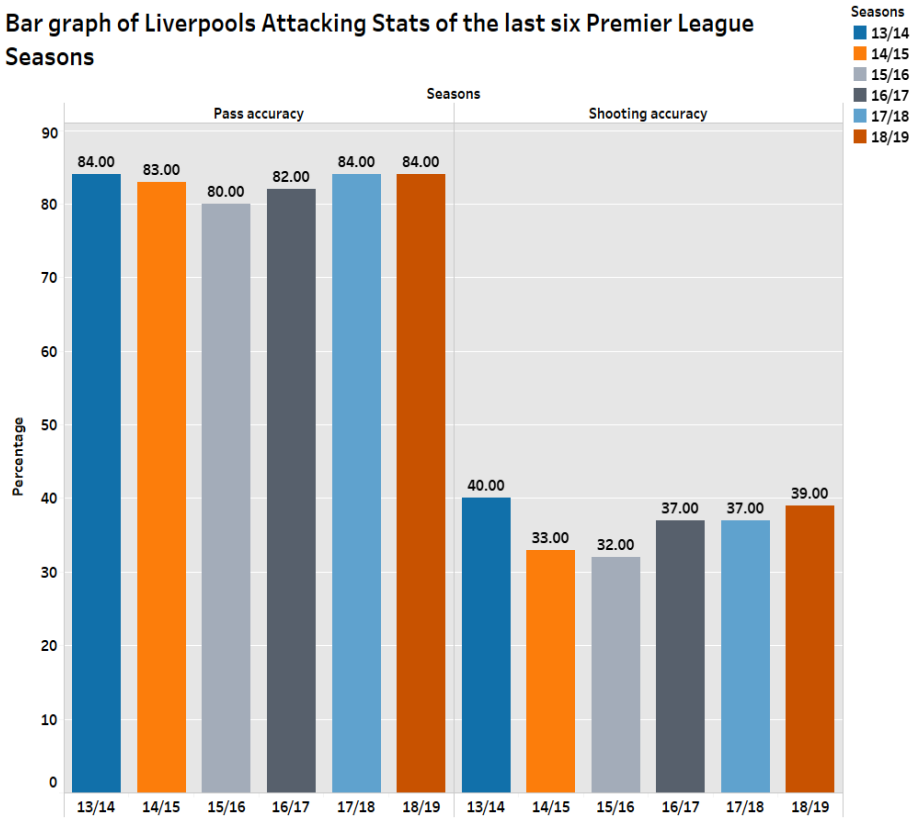


Figure 7

Figure 7 and *Figure 8* are plotted using *Table 3* with Tableau. Graph of *Figure 7* shows seasons and two attack parameters in x-axis, whereas y-axis represents percentages of pass accuracy and shooting accuracy. In *Figure 7*, we can see that there was dip in shooting accuracy in the season 14/15 and 15/16, thereafter it gradually increased. Passing accuracy was almost consistent throughout the last six seasons.

X-axis and y-axis of graph of *Figure 8* shows count value and seasons along with attack parameters respectively. Colors used in graph are color-blind friendly. From *Figure 8*, we can claim that the big chances created in the season 13/14 was the highest (88). Then there was a drastic decrease in the number (38) and thereafter it gradually increased. In the same way, goals scored has almost the similar figures.

Figure 9 and *Figure 10* are plotted based on *Table 4.* Colors used in plotting both the graphs are color-blind friendly. *Figure 10* shows various parameters of defensive stats and seasons in y-axis, count value of these parameters represented in x-axis. Team Liverpool has kept a lot of clean sheets and errors leading to goals has reduced. They conceded fewer number of goals in the season 18/19. Own goals are completely nil in last three seasons. So, we can depict that the team has strengthened their defense section.

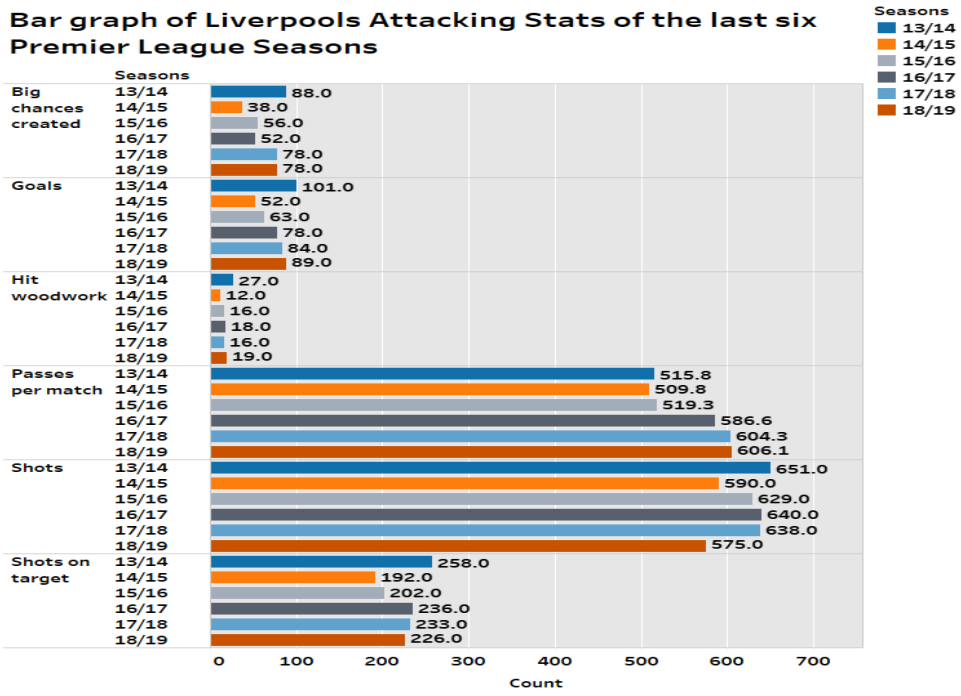


Figure 8

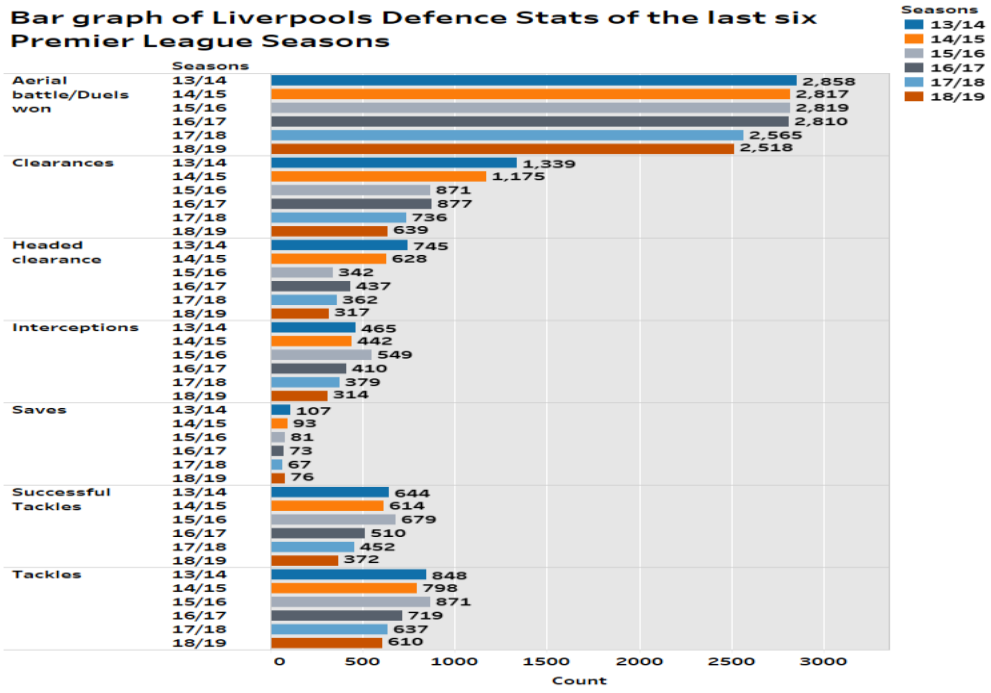


Figure 9

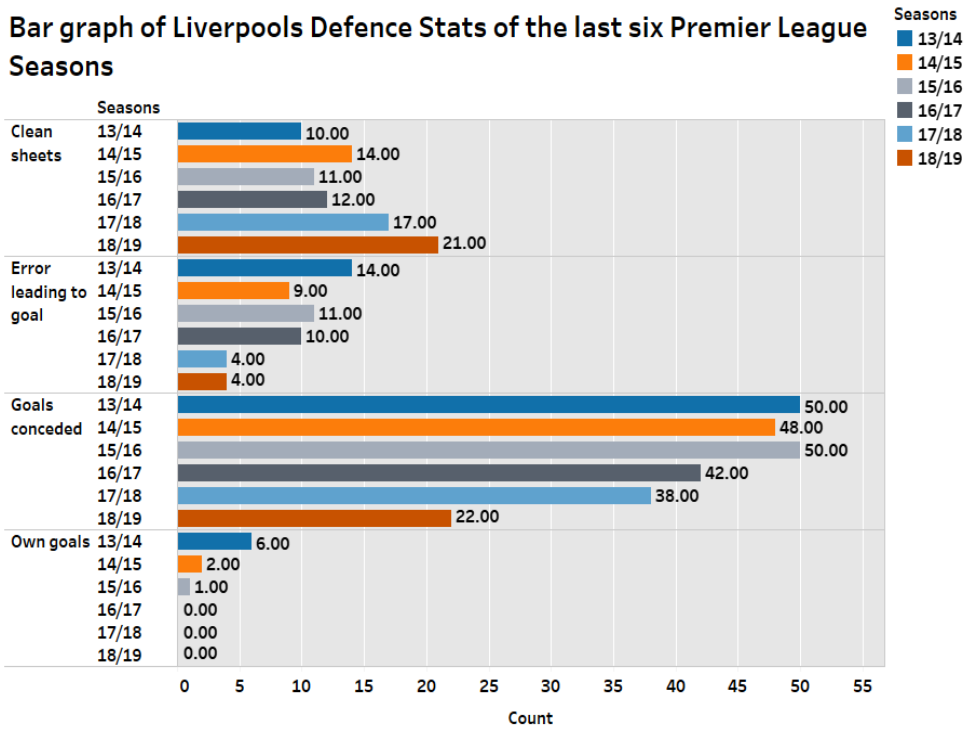


Figure 10

Challenges

The parameters involved in the data set were with varied ranges, scaling them together was difficult. Analyzing these data sets and establishing link between tables posed problem while plotting the graphs. It was very important to have deep understanding about terminologies that are used in this game. Also, choosing appropriate teams for providing better visualization was one of the major challenges.

Conclusion

To sum up, from these plotted graphs we can easily compare the stats of multiple teams in a single season and single team in multiple seasons. Also, analyzing all the data are made simpler because of visual representations. Finally, we were able to summarize the performance of the teams with the deep insights that we got from the simple bar graphs.

Contribution

We have worked for analyzing the table and plotting graph together for the same. We have decided on plotting possible graph for the chosen table. As a team, we also worked on class and writing the report for our project and contributed equally.

Anirudh Tunuguntla	Worked on analyzing the table of multiple teams in a single season 13/14 and plotted simple bar graphs using Tableau for respective table.
Prateek Chitpur	Worked on analyzing the table of single team in multiple seasons and plotted simple bar graphs using Tableau for respective table.

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