CERTIFICATE

This is to certify that Mr. Akshat Pankaj Kakade of class XII division SCIENCE roll number 16 has satisfactorily completed the project entitled FOOTBALL DATABASE MANAGEMENT SYSTEM during academic year 2023-24 in patrial fulfillment of the CBSE examination for the subject Informatics Practices(065).

Signature of Internal Examiner	*Signature of External Examiner*	*Signature of Vice-Principal*	*Signature of Principal*

Date: / /

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2. *Contents :*
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    b. *Objective and scope of project*
    c. *Analysis and visualization*
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City Pride School, Pune

A Project Report on

FOOTBALL DATABASE MANAGEMENT SYSTEM

For

Academic Year : 2023-24

[As a part of XII [CBSE] Informatics Practices (065)]

Submitted by:

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ACKNOWLEDGEMENT

I would like to express my greatest appreciation to everyone whohelped and supported me throughout the project.

I am indebted to the Principal, Vice Principal and the entire faculty ofCity Pride School for their support in successful completion of this Informatics Practices project

I am thankful to my Informatics Practices Teacher, Mrs. Amruta Dikefor her advice and encouragement that played a huge role to finalize this project report.

I would also like to thank all of my classmates who helped me in completing the project by exchanging interesting ideas and sharing their experiences.

I wish to thank my parents as well for their support and encouragement without which I could not have completed this projectin the limited time frame.

At the end, I want to thank my friends who displayed appreciation to my work and motivated me to continue my work.

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INTRODUCTION

In the dynamic world of football, where data-driven decisions can make or break a team's performance, the need for a robust and efficient Football Database Management System (FDMS) has never been more pronounced. This report delves into the intricacies of FDMS, a cutting-edge solution designed to streamline and optimize the storage, retrieval, and analysis of football-related data. In an era where data analytics plays a pivotal role in scouting, performance analysis, and team management, this report aims to showcase the significance of a well-implemented FDMS in elevating the game to new heights of excellence. Through an exploration of key features, benefits, implementation challenges, and real-world use cases, we endeavour to shed light on the indispensable role that FDMS plays in modern football management and strategy development.

Front-End:

Front-End is the development environment where we write the program code to develop the interface so that the user can communicate with the system. We have used Python to develop our project. Using Spyder, programs were developed and tested.

Back-End:

Back-End refers to the database where data is stored. We have used CSV as Back-End to store my data of items.
Both the software used for developing project work as specified by CBSE and freely available as they are open-source software

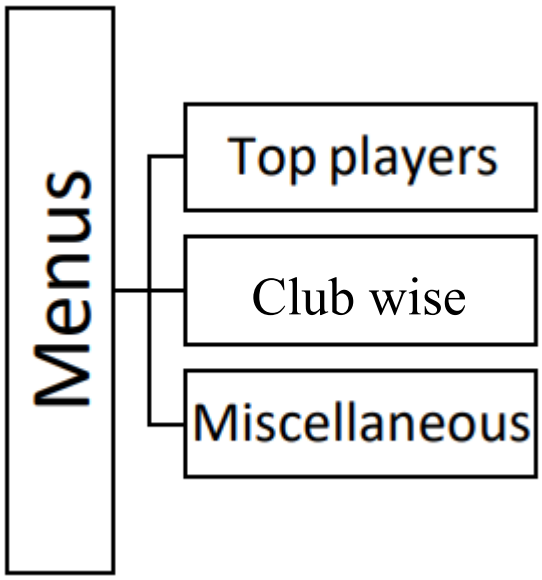
OBJECTIVE

The objective of a Menu-Driven Football Database Management System (FDBMS) is to provide a user-friendly platform for efficiently organizing, managing, and interacting with football-related data. It aims to offer easy data retrieval, entry, and updates, support reporting and analysis, ensure data security, scalability, integrity, and efficiency, provide backup and recovery mechanisms, offer user training and support, and comply with relevant regulations. Ultimately, the FDBMS serves to streamline the management and utilization of football data for various purposes within the football industry.

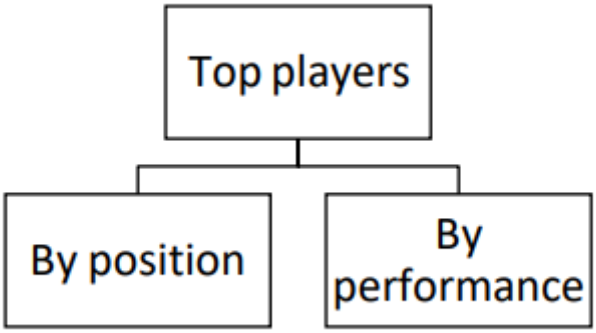
During the development of the Project, Python 5.4.5 by Spyder IDE ,a powerful, open source development environment, is used.

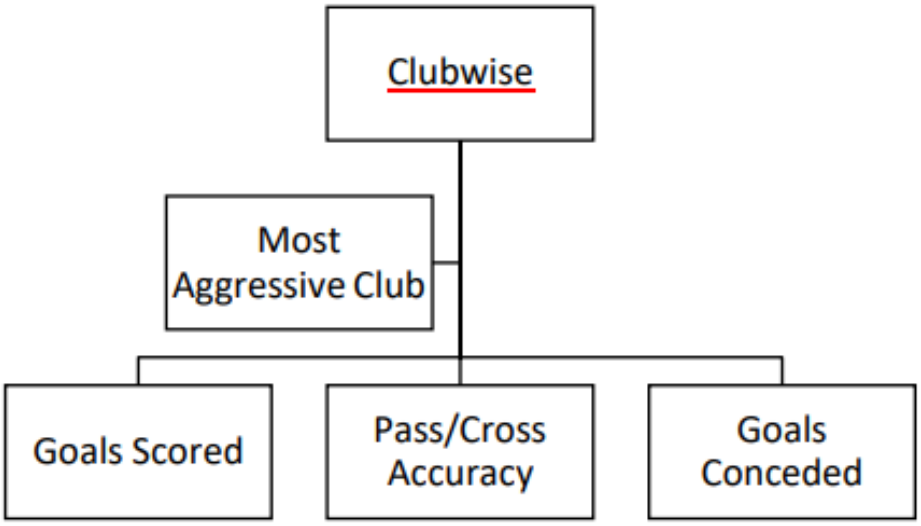
ANALYSIS AND DATA VISUALISATION

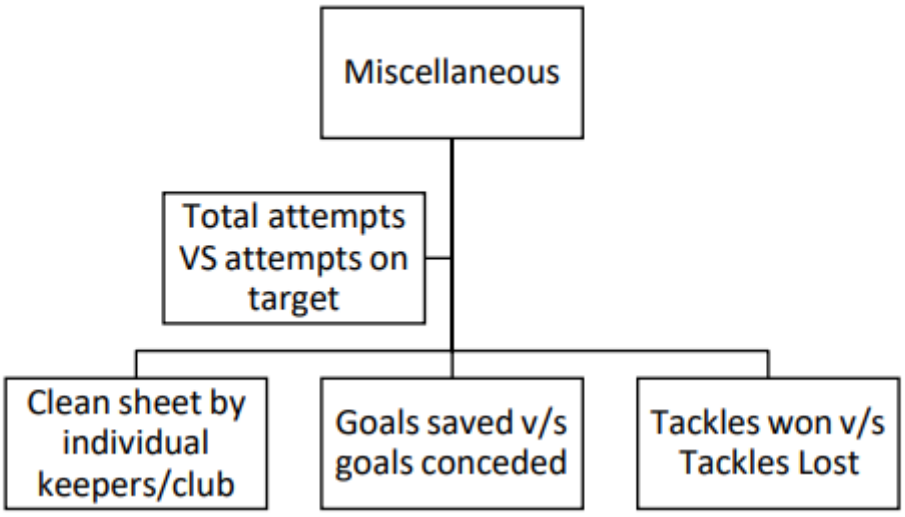
Part1: Menus



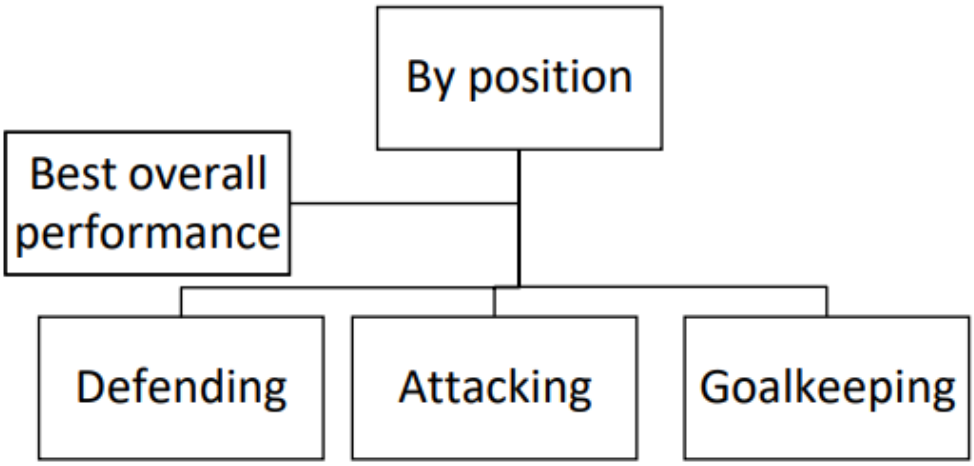
Part2: Submenus

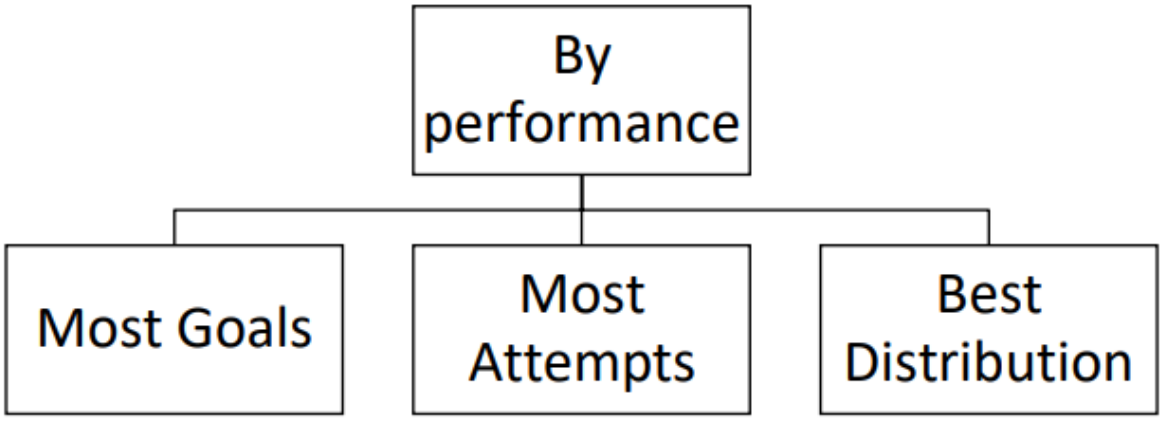






Part2: Sub-submenus





SYSTEM IMPLEMENTATION

Hardware Used:

- Lenovo Legion 5 15IMH05
- Intel(R) Core(TM) i5-8250U CPU @ 1.60GHz
- Installed RAM : 8.00 GB

Software Used:

- Python 3.0/IDLE as Front-End and Development environment
- CSV files as Back-End Server with database for testing.
- MS-Word for documentation.

BASE CSV FILE

We have used 8 CSV files as the base or the main CSV files for the data. We have modified and updated this file to make the graphs below.

1) Attacking.csv:

serial	player_nai	club	position	assists	corner_tal	offsides	dribbles	match_played
1	Bruno Fern	Man. Unit	Midfielder	7	10	2	7	7
2	VinÃcius J	Real Madr	Forward	6	3	4	83	13
2	SanÃ©	Bayern	Midfielder	6	3	3	32	10
4	Antony	Ajax	Forward	5	3	4	28	7
5	Alexander-	Liverpool	Defender	4	36	0	9	9
5	De Bruyne	Man. City	Midfielder	4	18	0	14	10
5	ModriÄ‡	Real Madr	Midfielder	4	10	0	8	13
5	JoÃ£o MÃ	Benfica	Midfielder	4	8	0	7	8
5	MbappÃ©	Paris	Forward	4	4	8	43	8
5	Gerard Mo	Villarreal	Forward	4	0	3	9	7
5	Capoue	Villarreal	Midfielder	4	0	0	17	12

2) Attempts.csv:

serial	player_nai	club	position	total_atte	on_target	off_target	blocked	match_played
1	Benzema	Real Madr	Forward	45	23	13	9	12
2	Salah	Liverpool	Forward	42	22	11	9	13
3	Mahrez	Man. City	Midfielder	37	18	8	11	12
4	SanÃ©	Bayern	Midfielder	33	13	12	8	10
5	Lewandow	Bayern	Forward	31	19	8	4	10
6	Luis DÃaz	Porto	Forward	29	11	7	11	13
7	MartÃnez	Inter	Forward	28	7	10	11	8
8	MbappÃ©	Paris	Forward	27	16	6	5	8
8	VinÃcius J	Real Madr	Forward	27	8	10	9	13
10	Havertz	Chelsea	Midfielder	26	11	9	6	9
10	Antony	Ajax	Forward	26	10	9	7	7
10	Messi	Paris	Forward	26	10	8	8	7

3) Defending.csv:

serial	player_nai	club	position	balls_reco	tackles	t_won	t_lost	clearance_	match_played
1	Casemiro	Real Madr	Midfielder	76	31	13	18	19	11
1	Ã‰der M	Real Madr	Defender	76	19	6	13	32	12
1	Reinildo	AtlÃ©tico	Defender	76	13	6	7	20	10
4	Fabinho	Liverpool	Midfielder	74	23	9	14	8	13
5	Albiol	Villarreal	Defender	73	9	6	3	62	12
6	Thiago Silv	Chelsea	Defender	65	9	4	5	17	9
7	Otamendi	Benfica	Defender	63	28	17	11	48	9
8	Capoue	Villarreal	Midfielder	62	11	1	10	29	12
8	Van Dijk	Liverpool	Defender	62	3	2	1	29	9
10	JoÃ£o Can	Man. City	Defender	56	9	6	3	13	9
11	Foyth	Villarreal	Defender	55	20	10	10	30	10
11	Pavard	Bayern	Defender	55	12	7	5	17	10

4) Disciplinary.csv:

serial	player_nai	club	position	fouls_com	fouls_suffe	red	yellow	minutes_p	match_played
1	JoÃ£o Palh	Sporting C	Midfielder	23	17	2	0	534	6
2	Capoue	Villarreal	Midfielder	19	17	3	1	1046	12
2	Rodri	Man. City	Midfielder	19	4	2	0	842	10
2	Seiwald	Salzburg	Midfielder	19	3	2	0	649	8
5	Balanta	Club Brug	Midfielder	18	3	4	0	407	5
6	Casemiro	Real Madr	Midfielder	17	18	3	0	914	11
6	Ã‰der M	Real Madr	Defender	17	16	4	0	1076	12
6	Otamendi	Benfica	Defender	17	11	2	0	810	9
6	Gravenber	Ajax	Midfielder	17	11	1	0	703	8
6	Haller	Ajax	Forward	17	11	1	0	668	8
6	Ã lvarez	Ajax	Midfielder	17	6	4	0	558	7

5) Distribution.csv:

serial	player_nai	club	position	pass_accu	pass_atter	pass_com	cross_accu	cross_atte	cross_com	freekicks_	match_played
1	Erokhin	Zenit	Midfielder	98	27	26	0	2	0	0	6
2	Eric GarcÃ	Barcelona	Defender	97.5	203	197	0	0	0	1	4
3	Ulreich	Bayern	Goalkeepe	97	32	31	0	0	0	1	1
4	Rugani	Juventus	Defender	96.8	130	122	0	0	0	0	4
5	J. Timber	Ajax	Midfielder	95.8	497	474	0	1	0	14	8
6	Egan-Riley	Man. City	Defender	95	61	58	0	1	0	0	1
6	Mario Gas	Villarreal	Defender	95	32	29	0	1	0	1	2
8	Marlon	Shakhtar D	Defender	94.8	424	402	0	0	0	8	5
9	SÃ¼le	Bayern	Defender	94.7	429	413	0	2	0	9	7
9	Laporte	Man. City	Defender	94.7	707	672	0	0	0	10	9

6) Goalkeeping.csv:

serial	player_nai	club	position	saved	conceded	saved_per	cleanshee	punches n	match_played
1	Courtois	Real Madr	Goalkeepe	61	14	1	5	4	13
2	Rulli	Villarreal	Goalkeepe	41	16	0	3	12	12
3	Vlachodim	Benfica	Goalkeepe	38	17	1	5	5	10
4	Athanasiac	Sheriff	Goalkeepe	29	8	0	1	2	5
5	Mignolet	Club Brug	Goalkeepe	28	20	0	0	1	6
6	Oblak	AtlÃ©tico	Goalkeepe	26	10	0	3	2	10
7	Musso	Atalanta	Goalkeepe	21	13	0	1	1	6
8	Ersin Dest	BeÅŸiktaÅ	Goalkeepe	20	17	0	0	0	5
9	De Gea	Man. Unit	Goalkeepe	19	9	0	1	0	7
9	Dahlin	MalmÃ¶	Goalkeepe	19	8	1	0	3	4
11	Diogo Cos	Porto	Goalkeepe	18	11	0	2	2	6

7) Goals.csv:

serial	player_nai	club	position	goals	right_foot	left_foot	headers	others	inside_are	outside_a	penalties	match_played
1	Benzema	Real Madr	Forward	15	11	1	3	0	13	2	3	12
2	Lewandow	Bayern	Forward	13	8	3	1	1	13	0	3	10
3	Haller	Ajax	Forward	11	3	4	3	1	11	0	1	8
4	Salah	Liverpool	Forward	8	0	8	0	0	7	1	1	13
5	Nkunku	Leipzig	Midfielder	7	3	1	3	0	7	0	0	6
5	Mahrez	Man. City	Midfielder	7	1	4	2	0	7	0	2	12
7	MbappÃ©	Paris	Forward	6	6	0	0	0	6	0	0	8
7	NÃºÃ±ez	Benfica	Forward	6	5	0	1	0	6	0	1	10
7	Ronaldo	Man. Unit	Forward	6	5	0	1	0	4	2	0	7
7	Danjuma	Villarreal	Midfielder	6	3	3	0	0	6	0	1	11
7	SanÃ©	Bayern	Midfielder	6	1	5	0	0	3	3	0	10

8) Key_stats.csv:

player_na	club	position	minutes_p	match_pla	goals	assists	distance_covered
Courtois	Real Madr	Goalkeepe	1230	13	0	0	64.2
VinÃcius J	Real Madr	Forward	1199	13	4	6	133
Benzema	Real Madr	Forward	1106	12	15	1	121.5
ModriÄ‡	Real Madr	Midfielder	1077	13	0	4	124.5
Ã‰der M	Real Madr	Defender	1076	12	0	0	110.4
Alaba	Real Madr	Defender	1040	12	1	0	112.3
Carvajal	Real Madr	Defender	959	11	0	1	112.8
Casemiro	Real Madr	Midfielder	914	11	0	0	107.6
Kroos	Real Madr	Midfielder	902	12	2	0	116.5
Mendy	Real Madr	Defender	867	10	0	2	96.3
Valverde	Real Madr	Midfielder	804	11	0	1	96.7

CODE

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as py

def main_menu():
   print('Your Choices\n' '1. Top Players\n' '2. Club Stats\n' '3. League
Stats')
   mmdec = int(input('Enter Your Choice:'))
   if mmdec == 1:
      top_menu()
   elif mmdec == 2:
      club_menu()
   elif mmdec ==3:
      league_menu()
   else:
      print('Enter appropriate value')


 def top_menu():
    print('Your Choices:\n' '1. By Position\n' '2. By Performance\n' '3.
 Back to Main Menu')
    tmdec = int(input('Enter Your Choice:' ))
    if tmdec == 1:
       print('Your Choices:\n' '1. Defending\n' '2. Attacking\n' '3.
 Goalkeeping\n' '4. Best Overall Players\n' '5. Back to Top Menu')
       tm_pos_dec = int(input('Enter Your Choice:'))
       if tm_pos_dec == 1:
          top_def()
       elif tm_pos_dec == 2:
          top_att()
       elif tm_pos_dec == 3:
          top_gk()
       elif tm_pos_dec == 4:
          top_bop()
       elif tm_pos_dec == 5:
          top_menu()
       else:
```

```
            print('Enter appropriate value')
        elif tmdec == 2:
            print('Your Choices\n' '1. Most Goals\n' '2. Most Attempts\n' '3.
 Best Distribution\n' '4. Back to Top Menu')
            tm_per_dec = int(input('Enter Your Choice:' ))
            if tm_per_dec == 1:
                most_goals()
            elif tm_per_dec == 2:
                most_attempts()
            elif tm_per_dec == 3:
                best_distri()
            elif tm_per_dec == 4:
                top_menu()
            else:
                print('Enter appropriate value')
        elif tmdec == 3:
            main_menu()
        else:
            print('Enter appropriate value')


def club_menu():
    print('Your Choices are\n"1.Most Aggresive Club\n' '2.Goals Scored\n'
'3.Pass/Cross Accuracy\n' '4.Goals Conceded\n' '5. Back to Main Menu')
    cmdec=int(input('Enter Your Choice'))
    if cmdec==1:
        most_aggresive()
    elif cmdec==2:
        goals_scored()
    elif cmdec==3:
        pass_cross_accuracy()
    elif cmdec==4:
        goals_conceded()
    elif cmdec==5:
        main_menu()
    else:
        print('Enter appropriate value')

def league_menu():
```

```
    print('Your Choices are\n"1.Total attempts VS attempts on target\n'
 '2.Clean sheet by individual keepers/club\n' '3.Goals saved v/s goals
 conceded\n' '4.Tackles won v/s Tackles Lost\n' '5. Back to Main Menu')
    lmdec=int(input('Enter Your Choice'))
    if lmdec==1:
        totvsaot()
    elif lmdec==2:
        clean_sheet()
    elif lmdec==3:
        savevsnotsave()
    elif lmdec==4:
        tackles()
    elif lmdec==5:
        main_menu()
    else:
        print('Enter appropriate value')

def top_def():
    defending = pd.read_csv('defending.csv')
    print(defending.head())

def top_att():
    attacking = pd.read_csv('attacking.csv')
    print(attacking.head())

def top_gk():
    gk = pd.read_csv('goalkeeping.csv')
    print(gk.head())

def top_bop():
    bop = pd.read_csv('key_stats.csv')
    print(bop.head())

def most_goals():
    mg = pd.read_csv('goals.csv')
    print(mg.head())

def most_attempts():
```

```
    ma = pd.read_csv('attempts.csv')
    print(ma.head())

def best_distri():
    md = pd.read_csv('distributon.csv')
    print(md.head())

def most_aggresive():
    df_attacking = pd.read_csv("attacking.csv")

    club_aggr = df_attacking.groupby('club')[['dribbles',
'assists']].sum().sort_values(by='dribbles', ascending=False)
    print(club_aggr)
    py.figure(figsize=(10, 8))
    club_aggr.plot(kind='bar', stacked=True, color=['red', 'blue'],
edgecolor='black', ax=py.gca())
    py.title('Most aggressive clubs')
    py.xlabel('Club')
    py.ylabel('Total Count')
    py.xticks(rotation=45)
    py.tight_layout()
    py.show()

def goals_scored():
   df_scored = pd.read_csv("goals.csv")

   club_scored =
df_scored.groupby('club')[['goals']].sum().sort_values(by='goals',
ascending=False)
   print(club_scored)
   py.figure(figsize=(10, 8))
   club_scored.plot(kind='bar', stacked=True, color=['green'],
edgecolor='black', ax=py.gca())
   py.title('Goals Scored')
   py.xlabel('Club')
   py.ylabel('Total Count')
   py.xticks(rotation=45)
   py.tight_layout()
```

```
    py.show()

def pass_cross_accuracy():
    df_accuracy = pd.read_csv("distributon.csv")

    club_accuracy =
df_accuracy.groupby('club')[['pass_accuracy','cross_accuracy']].sum().sor
t_values(by='pass_accuracy', ascending=False)
    print(club_accuracy)
    py.figure(figsize=(10, 8))
    club_accuracy.plot(kind='bar', stacked=True,
color=['orange','magenta'], edgecolor='black', ax=py.gca())
    py.title('Pass/Cross accuracy')
    py.xlabel('Club')
    py.ylabel('Total Count')
    py.xticks(rotation=45)
    py.tight_layout()
    py.show()

def goals_conceded():
    df_accuracy = pd.read_csv("goalkeeping.csv")

    club_conceded =
df_accuracy.groupby('club')[['conceded','saved_penalties']].sum().sort_va
lues(by='conceded', ascending=False)
    print(club_conceded)
    py.figure(figsize=(10, 8))
    club_conceded.plot(kind='bar', stacked=True, color=['cyan','crimson'],
edgecolor='black', ax=py.gca())
    py.title('Goals Conceded')
    py.xlabel('Club')
    py.ylabel('Total Count')
    py.xticks(rotation=45)
    py.tight_layout()
    py.show()

def totvsaot():
    df_totaot = pd.read_csv("attempts.csv")
```

```
    df_totaot1 = df_totaot.head(30)
    league_totaot =
df_totaot1.groupby('player_name')[['total_attempts','on_target']].sum().so
rt_values(by='total_attempts', ascending=False)
    print(league_totaot)
    py.figure(figsize=(10, 8))
    league_totaot.plot(kind='bar', stacked=True, color=['yellow','green'],
edgecolor='black', ax=py.gca())
    py.title('Total attempts VS Attempts on Target')
    py.xlabel('')
    py.ylabel('Total Count')
    py.xticks(rotation=45)
    py.tight_layout()
    py.show()


  def clean_sheet():
      df_clean = pd.read_csv("goalkeeping.csv")
      df_clean1 = df_clean.head(20)
      league_clean =
  df_clean1.groupby('player_name')[['cleansheets']].sum().sort_values(by='
  cleansheets', ascending=False)
      print(league_clean)
      py.figure(figsize=(10, 8))
      league_clean.plot(kind='bar', stacked=True, color=['blue'],
  edgecolor='black', ax=py.gca())
      py.title('Clean Sheet')
      py.xlabel('Player')
      py.ylabel('Total Count')
      py.xticks(rotation=45)
      py.tight_layout()
      py.show()


def savevsnotsave():
    df_savevsnotsave = pd.read_csv("goalkeeping.csv")
    df_savevsnotsave1 = df_savevsnotsave.head(30)
    league_savevsnotsave =
df_savevsnotsave1.groupby('club')[['saved','conceded']].sum().sort_value
s(by='saved', ascending=False)
```

```
    print(league_savevsnotsave)
    py.figure(figsize=(10, 8))
    league_savevsnotsave.plot(kind='bar', stacked=True,
color=['cyan','black'], edgecolor='black', ax=py.gca())
    py.title('Goals Saved VS Goals Conceded')
    py.xlabel('Club')
    py.ylabel('Total Count')
    py.xticks(rotation=45)
    py.tight_layout()
    py.show()


  def tackles():
      tac=pd.read_csv('defending.csv')
      tac1=tac.head(35)

  league_tac=tac1.groupby('club')['t_won','t_lost'].sum().sort_values(by='t_
  won',ascending=False)

  league_tac.plot(kind='bar',stacked=True,color=['purple','black'],edgecolo
  r='black',ax=py.gca())
      print(league_tac)
      py.xlabel('Club')
      py.ylabel('Total Count')
      py.xticks(rotation=45)
      py.tight_layout()
      py.show()

main_menu()
```

GRAPHS

Stacked graph

1.Most Aggresive Club

2.Goals Scored

3.Pass/Cross Accuracy

4.Goals Conceded

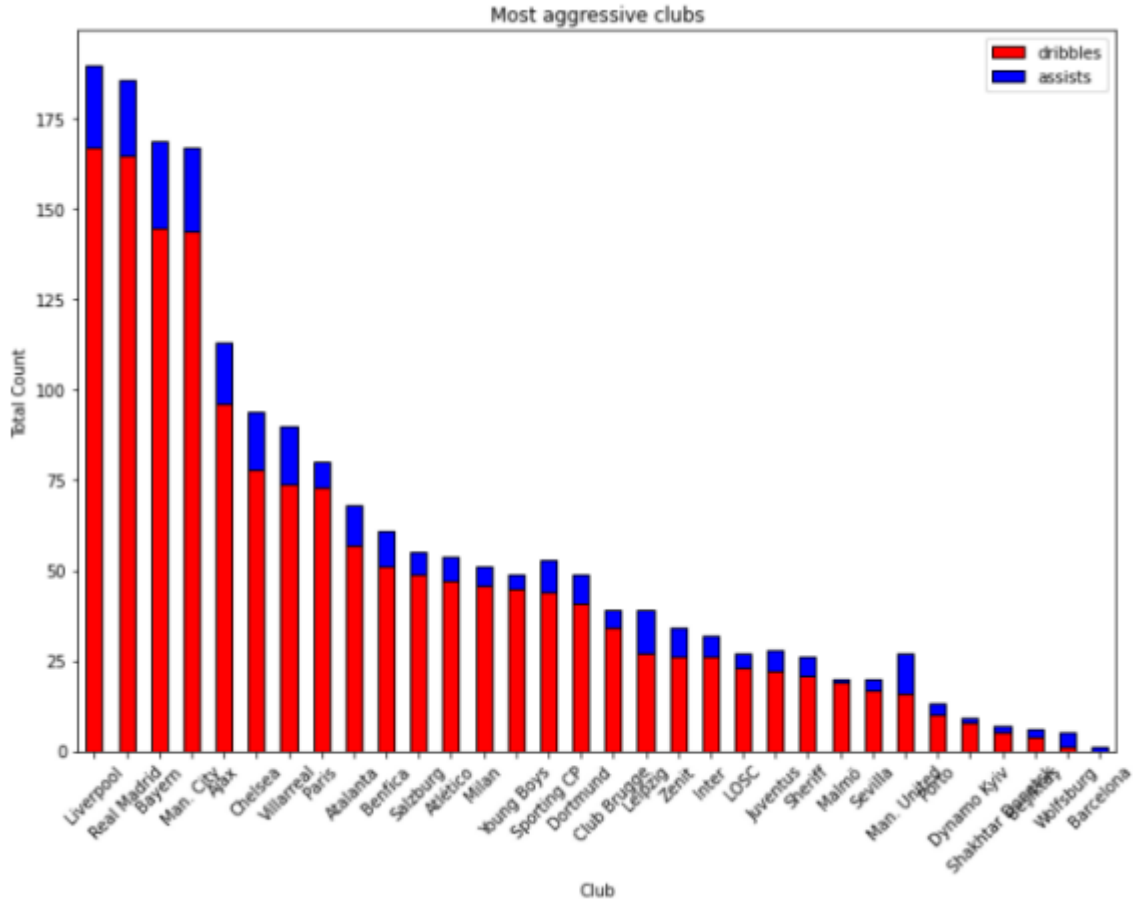
5.Total attempts VS attempts on target

5.Clean sheet by individual keepers/club

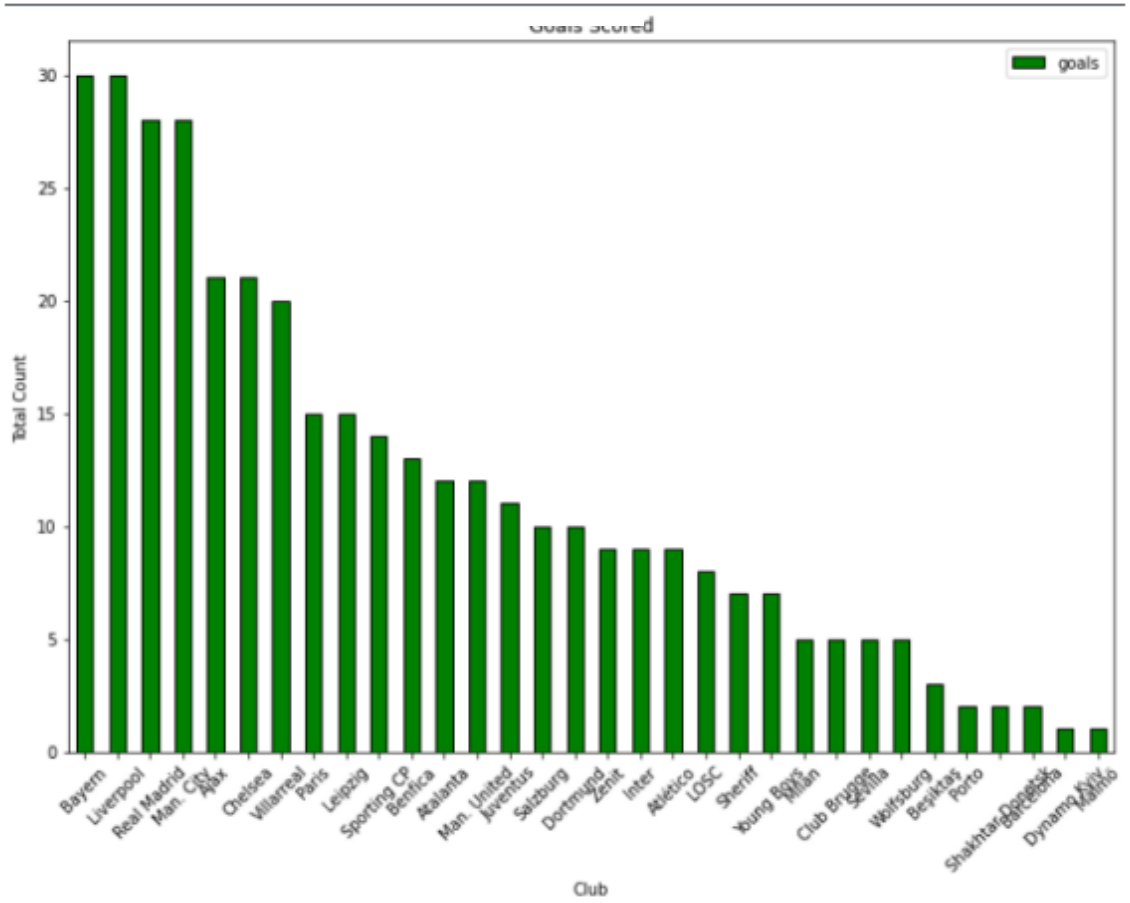
6.Goals saved v/s goals conceded

7.Tackles won v/s Tackles Lost

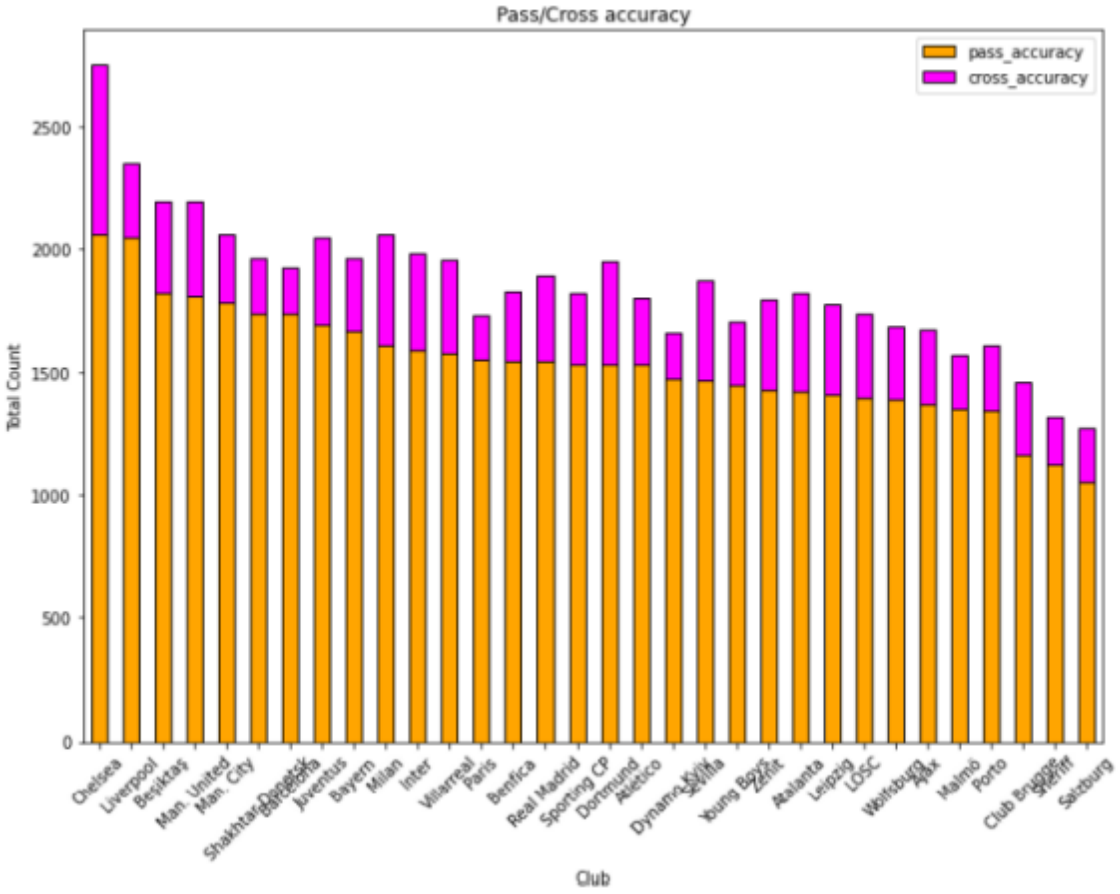
1. **Most Aggressive Club:**



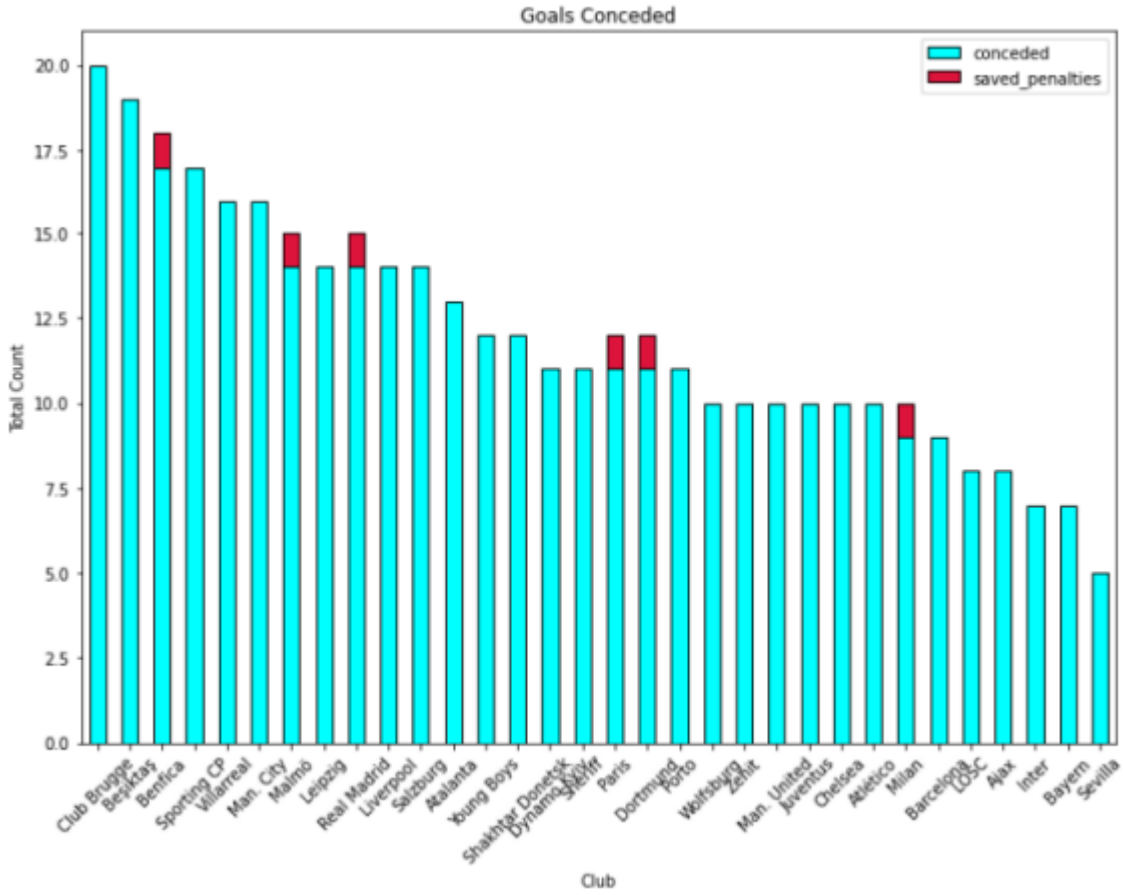
2.**Goals Scored:**



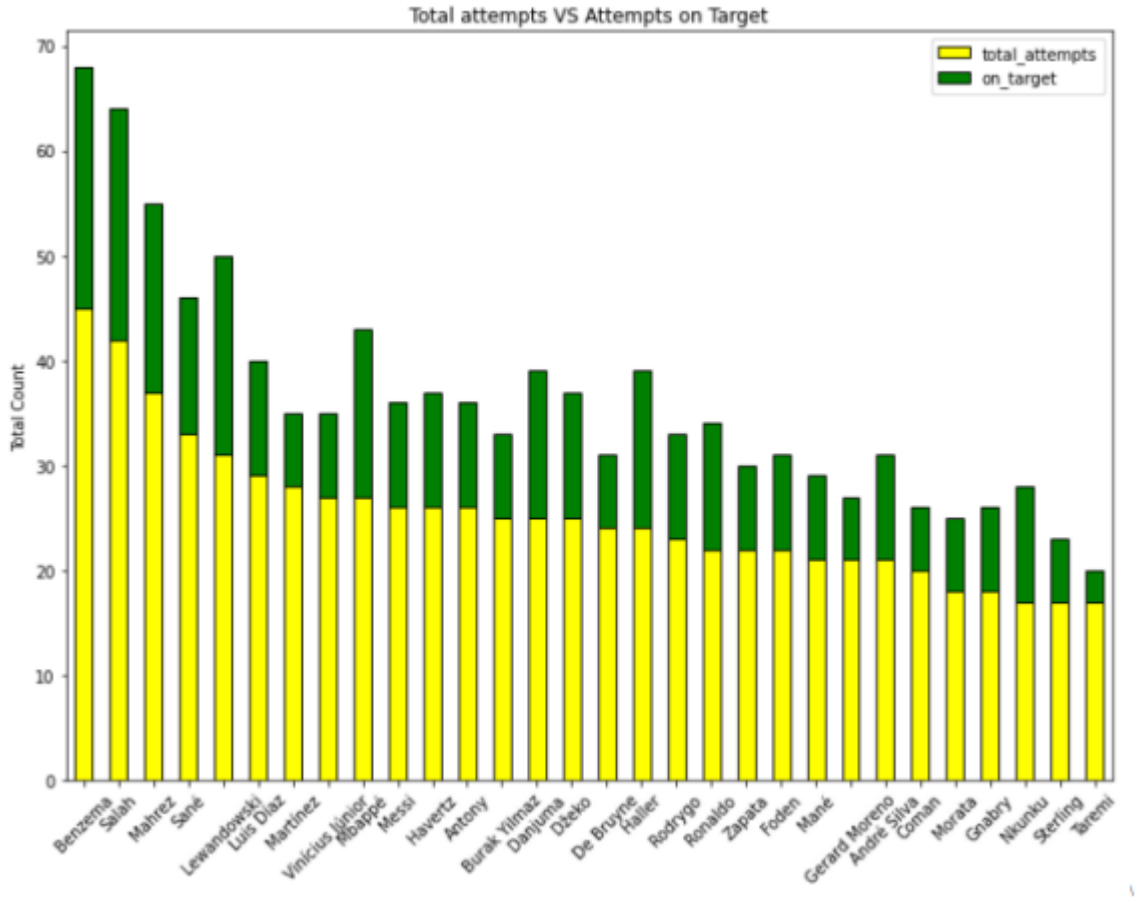
3.**Pass/Cross Accuracy:**



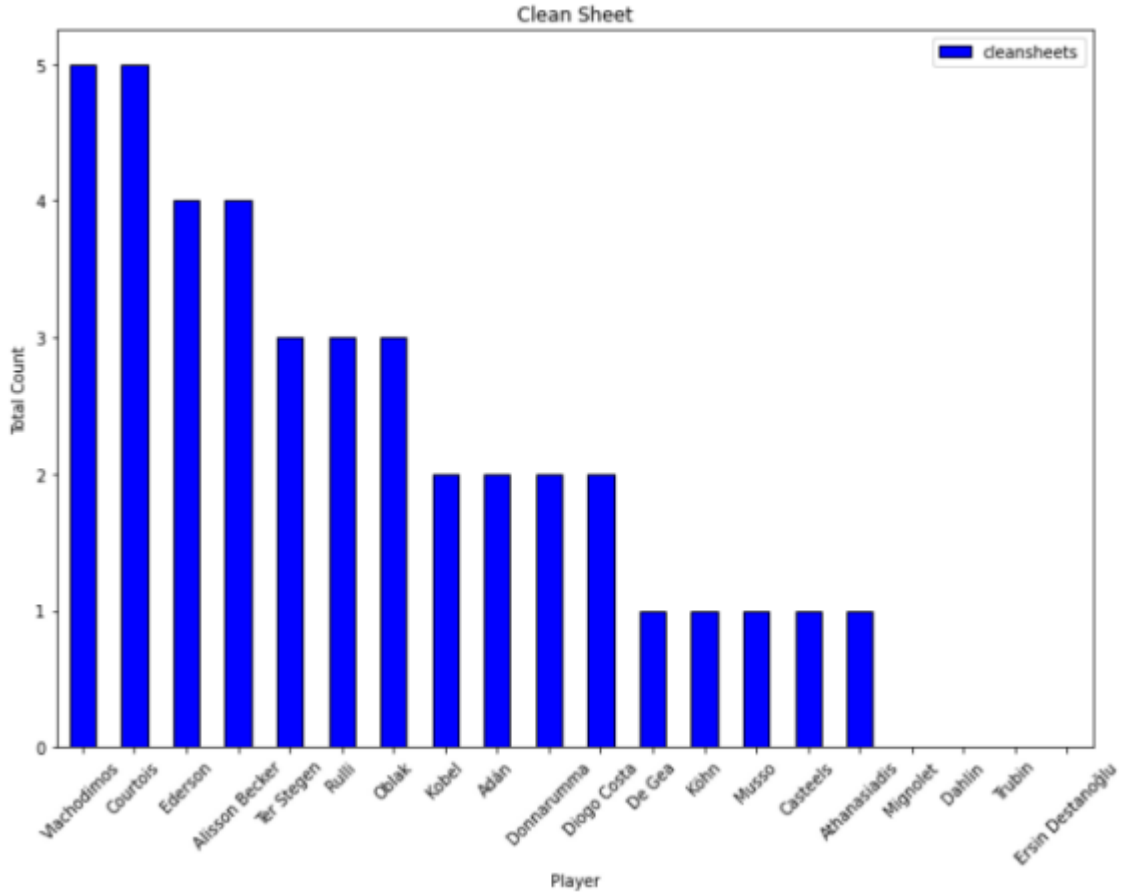
4.**Goals Conceded:**



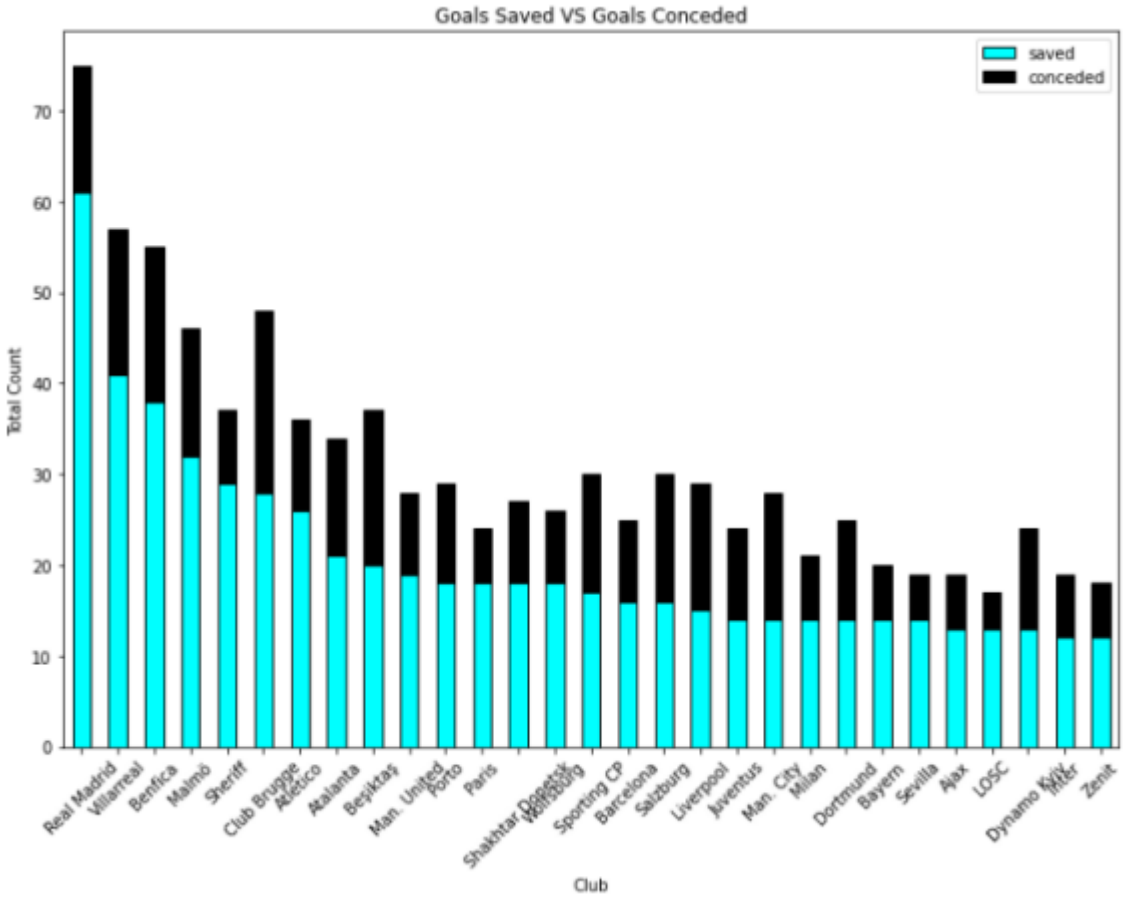
5.<u>Total attempts VS attempts on target:</u>



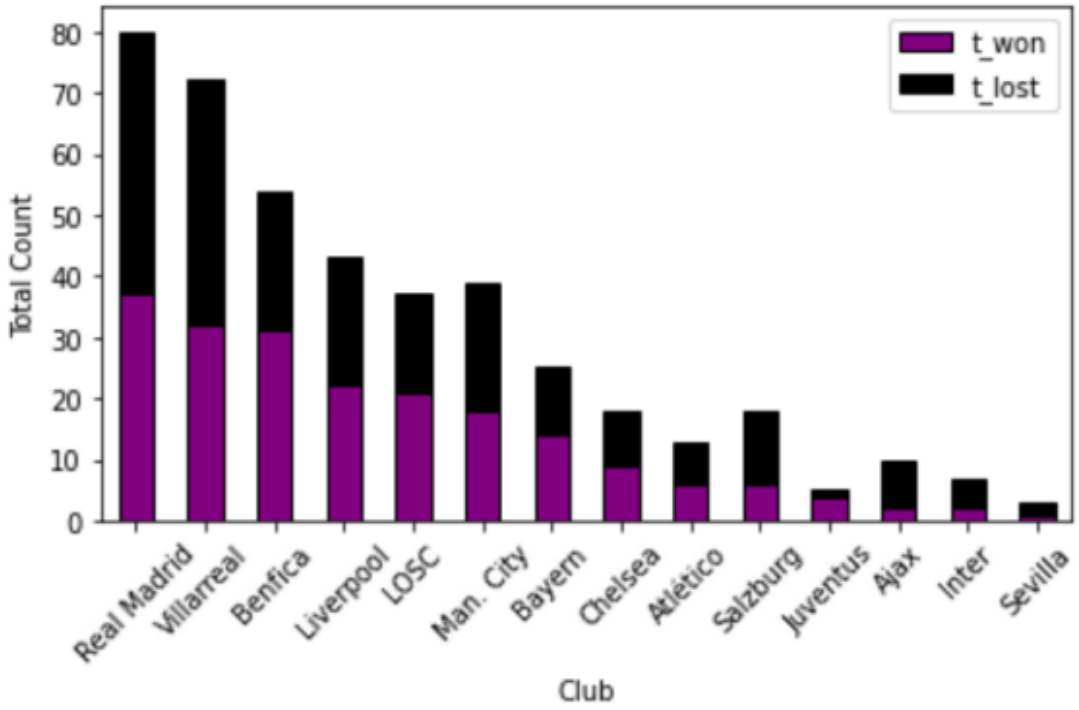
6.**Clean sheet by individual keepers/club:**



7.**Goals saved VS goals conceded:**



8. **Tackles won VS Tackles Lost:**



USER MANUAL

Hardware Requirements:

- Latest Intel Processor-based PC/Laptop at Client/Server end.
- 1GB RAM and 4GB HDD space (for Database) is desirable.
- Standard I/O devices like Keyboard and Mouse etc.

Software Requirements:

- Python Version 4.0 or higher should be installed with Pandas and MatPlotLibLibrary.
- Windows 2000/XP OS is desirable

REFERENCES

In order to work on this project, We have referred to the following books and websites:

- Informatic Practices Class 12 by Sumita Arora
- https:// www.kaggle.com/datasets/ - Base CSV was taken from this website.
- https://stackoverflow.com

Other than the above-mentioned books and websites, the suggestions and supervision of our teacher, team members and our seniors experience also helped us to develop this software project.