epl_data

March 21, 2022

[1]:

```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import json
import numpy
pd.set_option('display.max_columns', 50)
plt.style.use("seaborn")
```

0.0.1 Reading and Preparing the Data

[2]:

```python
data1 = pd.read_json("./data/epl2017.json", lines=True)
data2 = pd.read_json("./data/epl2018.json", lines=True)
data3 = pd.read_json("./data/epl2019.json", lines=True)
data4 = pd.read_json("./data/epl2020.json", lines=True)
```

[3]:

```python
def getDataFrame(data):
    """Takes the dataframe and generates a new empty dataframe with column names from the keys of the dict

    Args:
        data (pd.DataFrame): the dataframe object

    Returns:
        pd.DataFrame: a new empty dataframe with the necessary columns
    """

    # take all the columns of the main dataframe in the columns variable
    columns = list(data.columns)

    # appending all the keys from each json data in the row
    # since the first row has all the values we use that
    [columns.append(key) for key in data.general_stats.iloc[0].keys()]
    [columns.append(key) for key in data.passing_stats.iloc[0].keys()]
    [columns.append(key) for key in data.offensive_stats.iloc[0].keys()]
    [columns.append(key) for key in data.defensive_stats.iloc[0].keys()]

    target_cols = ["offensive_stats", "defensive_stats",
                   "general_stats", "passing_stats"]


    df = pd.DataFrame(columns=columns)
    df.drop(columns=target_cols, inplace=True)

    return df

def fillDataFrame(data, df):
    """Fills the new dataframe from the old datafrme in place

    Args:
        data (pd.DataFrame): the old dataframe from which the data needs to be␣
 ↪extracted
        df (pd.DataFrame): the new dataframe to which the data needs to be␣
 ↪updated
    """

    target_cols = ["offensive_stats", "defensive_stats",
                   "general_stats", "passing_stats"]

    for column in data.columns:
        if column not in target_cols:
            df[column] = data[column]
        else:
            # iterate over all the records of that row and fetch data
            for idx, row in enumerate(data[column]):
                try:
                    for key, value in row.items():
                        df[key].iloc[idx] = value
                except Exception as e:
                    pass


    val = lambda data: data["$oid"]
    df._id = df._id.apply(val)


        # convert all the object types to float if it allows else the exception␣
 ↪block will catch them
    for column in df.columns:
        try:
            if df[column].dtype == "object":
                df[column] = df[column].astype(float)
        except Exception as e:
            pass
```

[4]:

```
# 2017 data
df1 = getDataFrame(data1)
fillDataFrame(data1, df1)

# 2018 data
df2 = getDataFrame(data2)
fillDataFrame(data2, df2)

# 2019 data
df3 = getDataFrame(data3)
fillDataFrame(data3, df3)

# 2020 data
df4 = getDataFrame(data4)
fillDataFrame(data4, df4)
```

```
/usr/local/lib/python3.9/site-packages/pandas/core/indexing.py:1637:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  self._setitem_single_block(indexer, value, name)
```

0.0.2 Plots Helper Functions

[5]:

```
def generatePlot(player, player_image_file):
    """Prints a dashboard for the player
    """

    data = [df1, df2, df3, df4]
    season = ["2017/18", "2018/19", "2019/20", "2020/21"]

    goals = []
    npg = []
    xg = []
    assists = []
    xa = []
    passes = []
    key_pass = []
    tklw = []
    interceptions = []
    blocks = []
    games = []
    minutes = []

    image_path = "./player_images/"
```

```
for df in data:
    try:
        goals.append(df[df["name"] == player]["goals"].values)
        npg.append(df[df["name"] == player]["npg"].values)
        xg.append(df[df["name"] == player]["xG"])
        assists.append(df[df["name"] == player]["assists"].values)
        xa.append(df[df["name"] == player]["xA"])
        passes.append(df[df["name"] == player]["Cmp"])
        key_pass.append(df[df["name"] == player]["key_passes"])
        blocks.append(df[df["name"] == player]["Blocks"])
        interceptions.append(df[df["name"] == player]["Int"])
        tklw.append(df[df["name"] == player]["TklW"])
        games.append(df[df["name"] == player]["games"].values)
        minutes.append(df[df["name"] == player]["time"].values)
    except:
        goals.append(0)
        npg.append(0)
        xg.append(0)
        passess.append(0)
        key_passes.append(0)
        blocks.append(0)
        interceptions.append(0)
        tklw.append(0)
        games.append(0)
        minutes.append(0)

# creating the dashboard
plt.style.use("seaborn")
plt.tight_layout()
fig = plt.figure()
text = f"{player} in the Premier Leagure (2017-18 to 2020-21)"
fig.suptitle(t=text, x=.7, y=1.7, fontsize=14, fontweight="bold")

ax1 = fig.add_axes([0,0,.7,1])
ax2 = fig.add_axes([0.8, 0, .7, 1])
ax3 = fig.add_axes([0, 1.1, .7, 0.5])
ax4 = fig.add_axes([0.8, 1.1, .7, 0.5])
ax1.margins(x=.1,y=.1)
ax2.margins(x=.1,y=.1)

# offensive stats
ax1.plot(season, goals, label="Goals", marker="o")
ax1.plot(season, xg, label="xG", marker="o")
ax1.plot(season, assists, label="Assists", marker="o")
ax1.plot(season, xa, label="xA", marker="o")
ax1.plot(season, npg, label="Non Penalty Goals", marker="o")
```

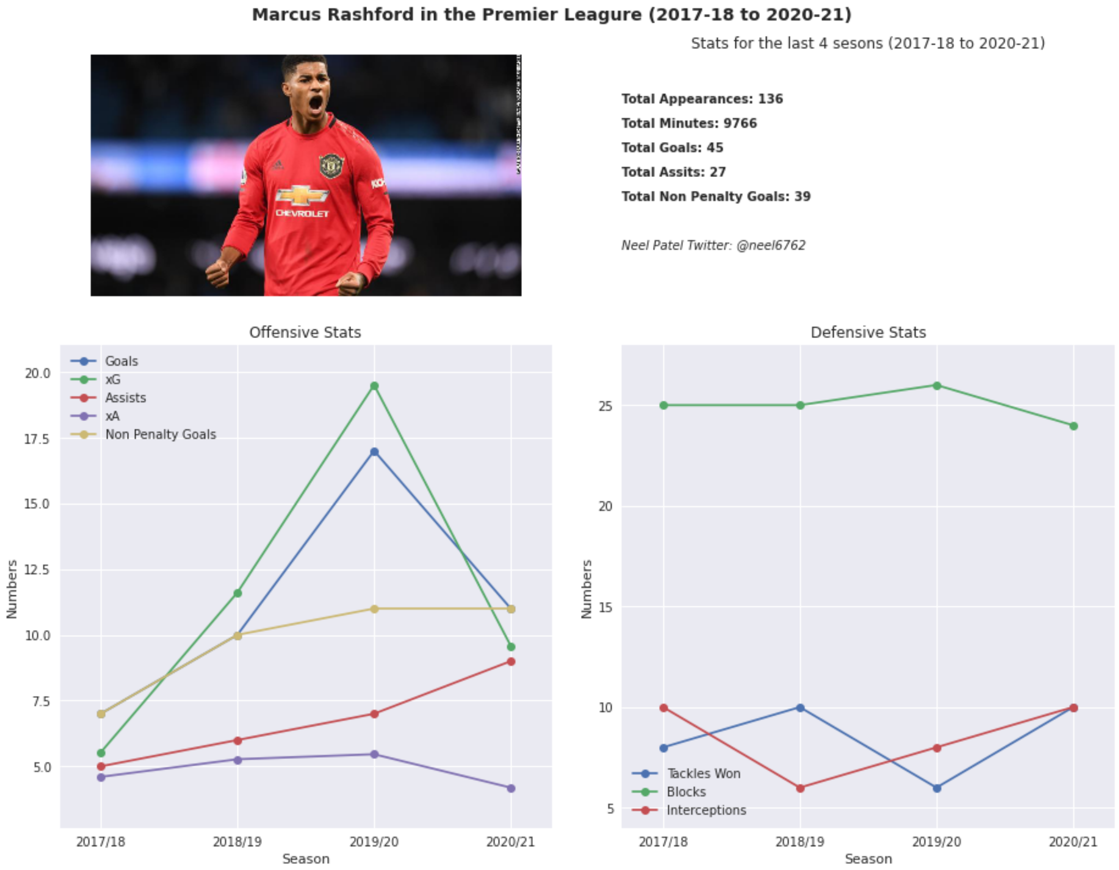
```
    ax1.legend(loc=0)
    ax1.set_title("Offensive Stats")
    ax1.set_xlabel("Season")
    ax1.set_ylabel("Numbers")

    # defensive stats
    ax2.plot(season, tklw, label="Tackles Won", marker="o")
    ax2.plot(season, blocks, label="Blocks", marker="o")
    ax2.plot(season, interceptions, label="Interceptions", marker="o")
    ax2.legend(loc=0)
    ax2.set_title("Defensive Stats")
    ax2.set_xlabel("Season")
    ax2.set_ylabel("Numbers")

    # general stats
    ax4.axes.set_xticks([])
    ax4.axes.set_yticks([])
    ax4.axes.set_facecolor("white")
    ax4.text(0, 0.8, "Total Appearances: " + str(int(sum(games)[0])),␣
 ↪fontweight="bold")
    ax4.text(0, 0.7, "Total Minutes: " + str(int(sum(minutes)[0])),␣
 ↪fontweight="bold")
    ax4.text(0, 0.6, "Total Goals: " +
             str(int(sum(goals)[0])), fontweight="bold")
    ax4.text(0, 0.5, "Total Assits: " +
             str(int(sum(assists)[0])), fontweight="bold")
    ax4.text(0, 0.4, "Total Non Penalty Goals: " +
             str(int(sum(npg)[0])), fontweight="bold")
    ax4.text(0, 0.2, "Neel Patel Twitter: @neel6762", fontstyle="italic")
    ax4.set_title("Stats for the last 4 sesons (2017-18 to 2020-21)")

    # player image
    plt.style.use("classic")
    ax3.axes.set_xticks([])
    ax3.axes.set_yticks([])
    temp_img = plt.imread(image_path + player_image_file)
    ax3.imshow(temp_img)
```

0.0.3 Marcus Rashford

[6]:

```
generatePlot("Marcus Rashford", "mr.jpeg")
```

```
<Figure size 576x396 with 0 Axes>
```



Marcus Rashford in the Premier Leagure (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

Total Appearances: 136

Total Minutes: 9766

Total Goals: 45

Total Assits: 27

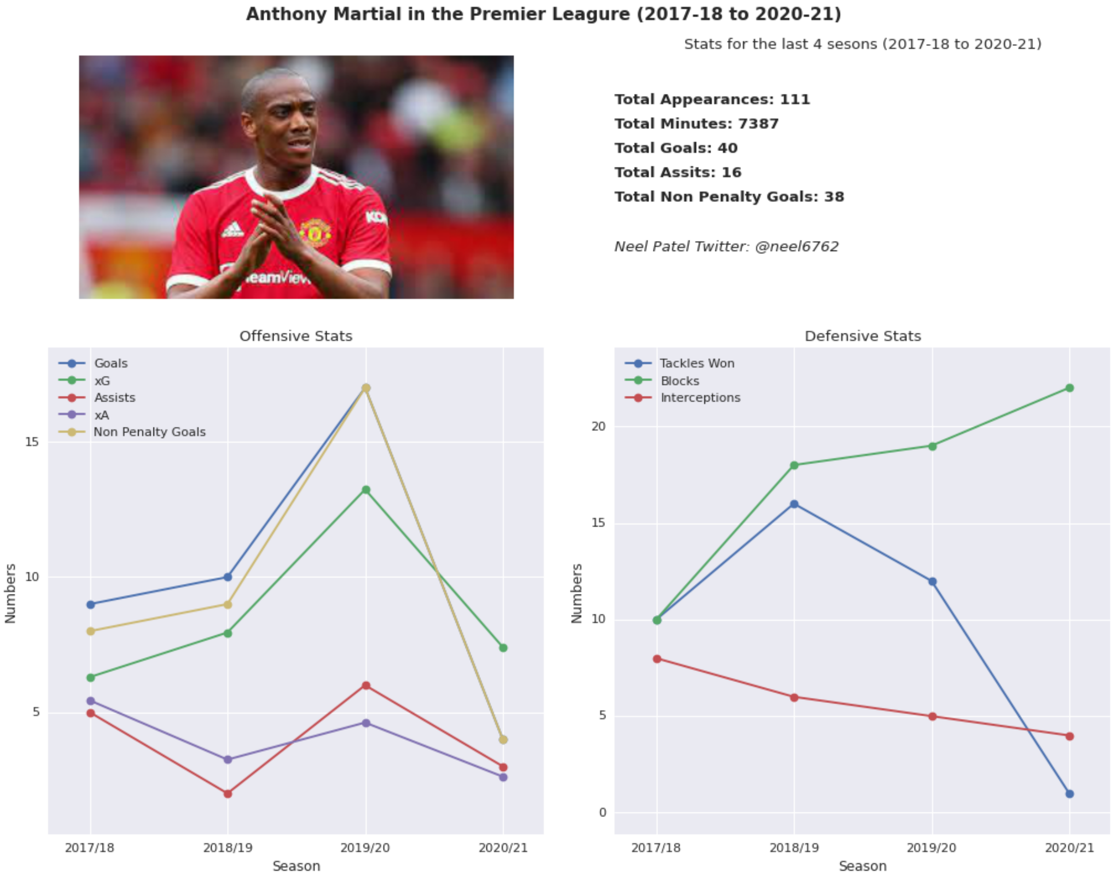
Total Non Penalty Goals: 39

Neel Patel Twitter: @neel6762

0.0.4 Anthony Martial

```
[7]: generatePlot("Anthony Martial", "martial.jpeg")
```

```
<Figure size 640x440 with 0 Axes>
```



Anthony Martial in the Premier League (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

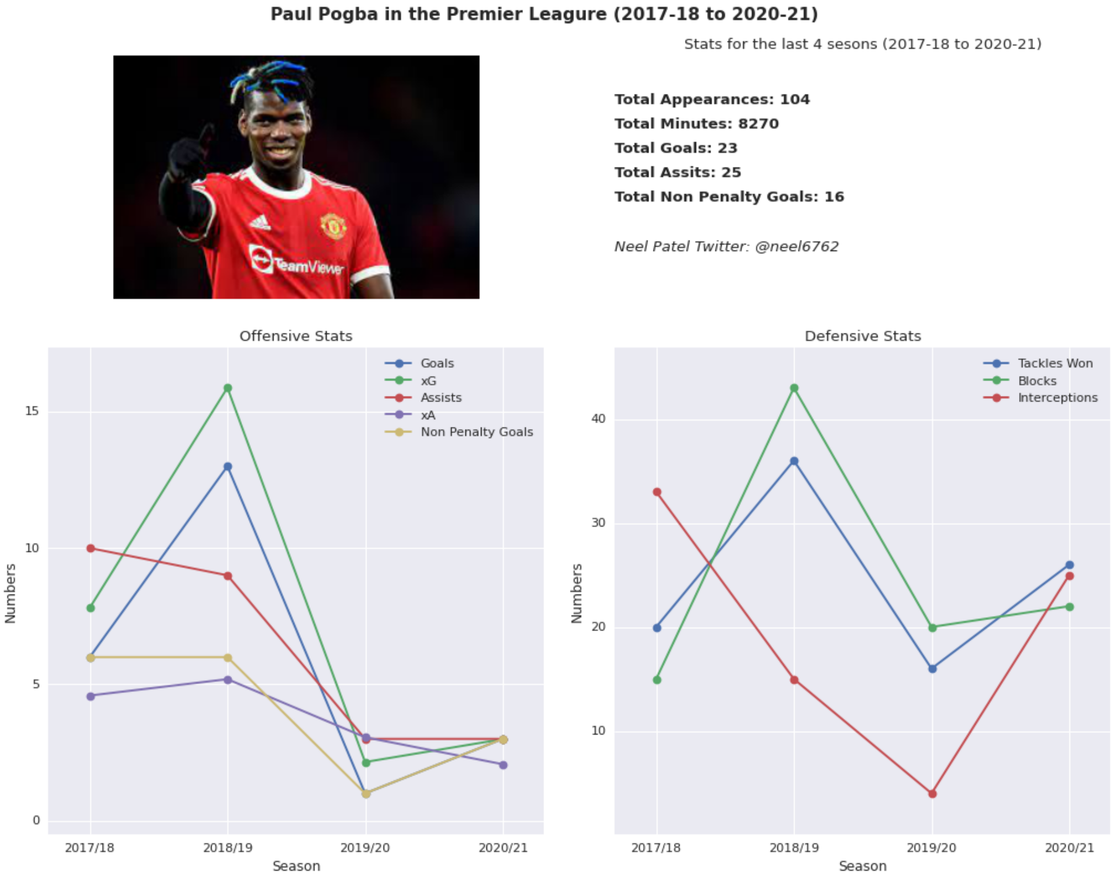
Total Appearances: 111
Total Minutes: 7387
Total Goals: 40
Total Assits: 16
Total Non Penalty Goals: 38

Neel Patel Twitter: @neel6762

0.0.5 Paul Pogba

[8]:
```
generatePlot("Paul Pogba", "pogba.jpeg")
```

```
<Figure size 640x440 with 0 Axes>
```



Paul Pogba in the Premier League (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

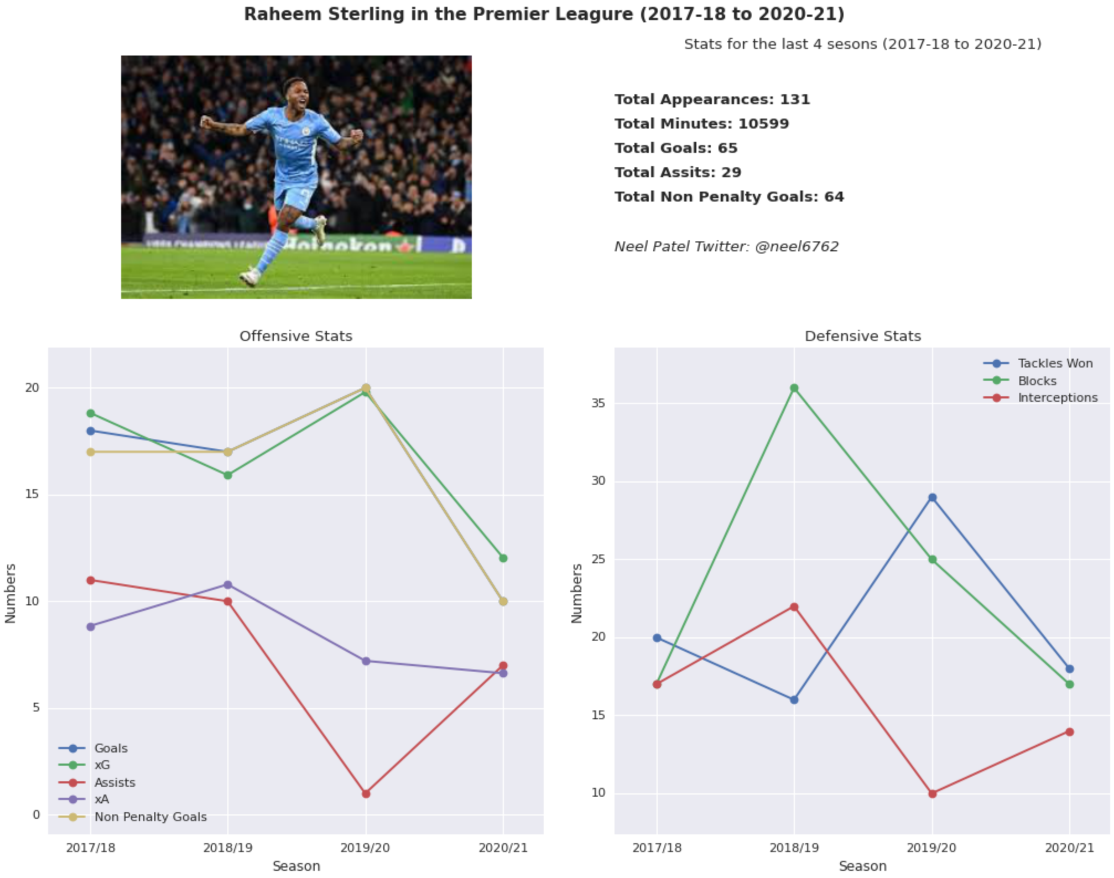
Total Appearances: 104
Total Minutes: 8270
Total Goals: 23
Total Assits: 25
Total Non Penalty Goals: 16

Neel Patel Twitter: @neel6762

0.0.6 Raheem Sterling

[9]:
```
generatePlot("Raheem Sterling", "rs.jpeg")
```

```
<Figure size 640x440 with 0 Axes>
```



Raheem Sterling in the Premier League (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

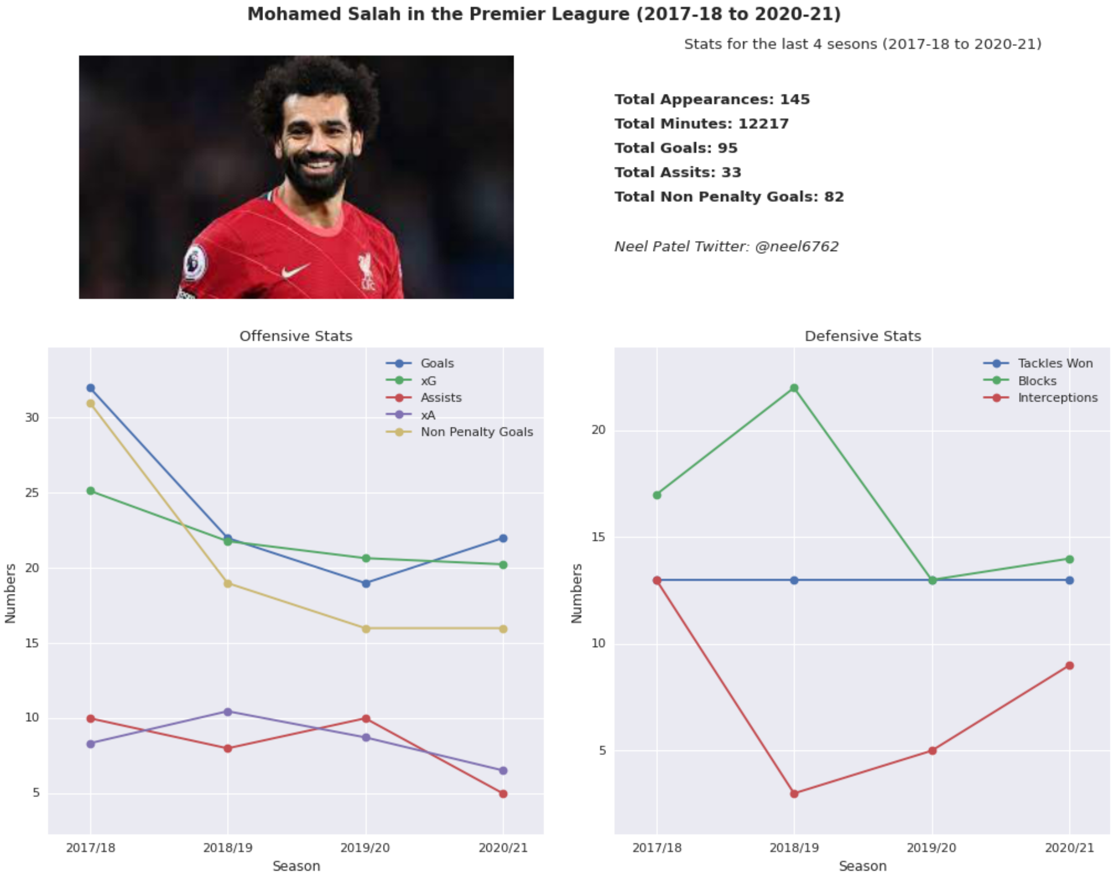
Total Appearances: 131
Total Minutes: 10599
Total Goals: 65
Total Assits: 29
Total Non Penalty Goals: 64

Neel Patel Twitter: @neel6762

0.0.7 Mo Salah

```
[10]: generatePlot("Mohamed Salah", "salah.jpeg")
```

```
<Figure size 640x440 with 0 Axes>
```



Mohamed Salah in the Premier League (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

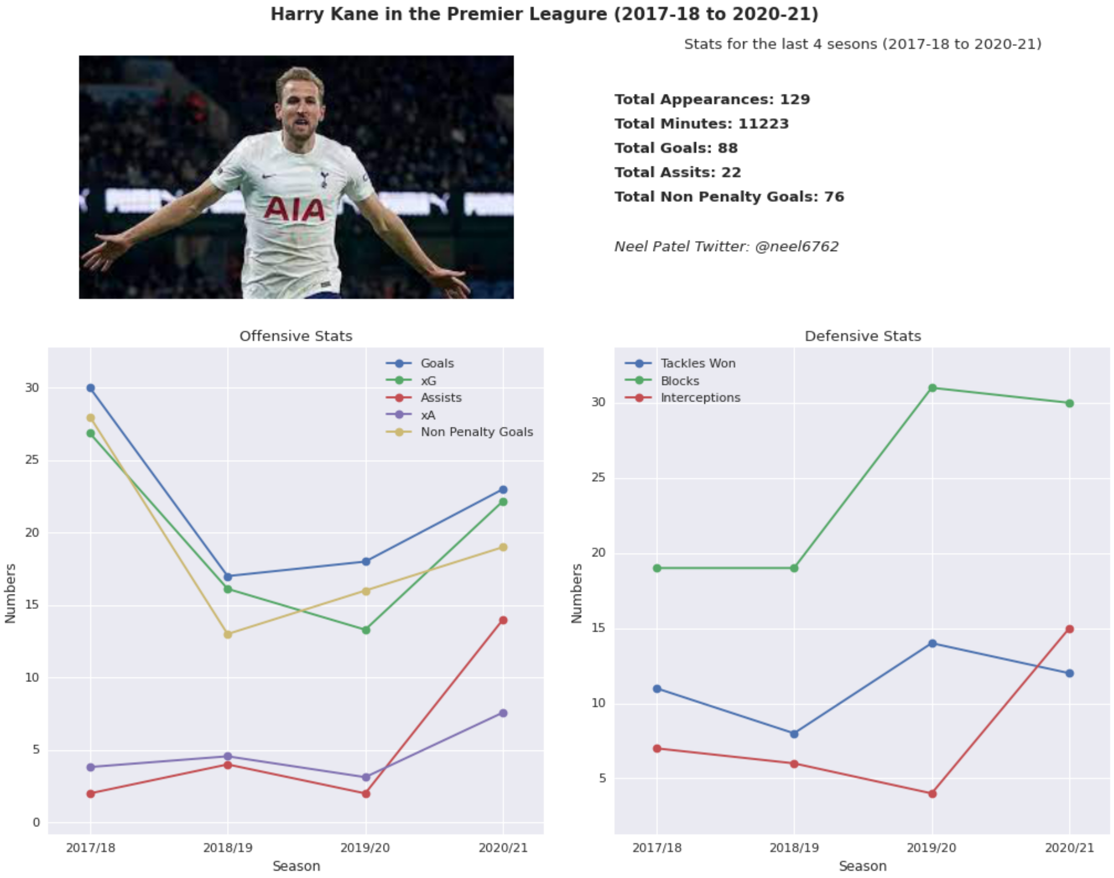
Total Appearances: 145
Total Minutes: 12217
Total Goals: 95
Total Assits: 33
Total Non Penalty Goals: 82

Neel Patel Twitter: @neel6762

0.0.8 Harry Kane

```
[11]: generatePlot("Harry Kane", "kane.jpeg")
```

```
<Figure size 640x440 with 0 Axes>
```



Harry Kane in the Premier League (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

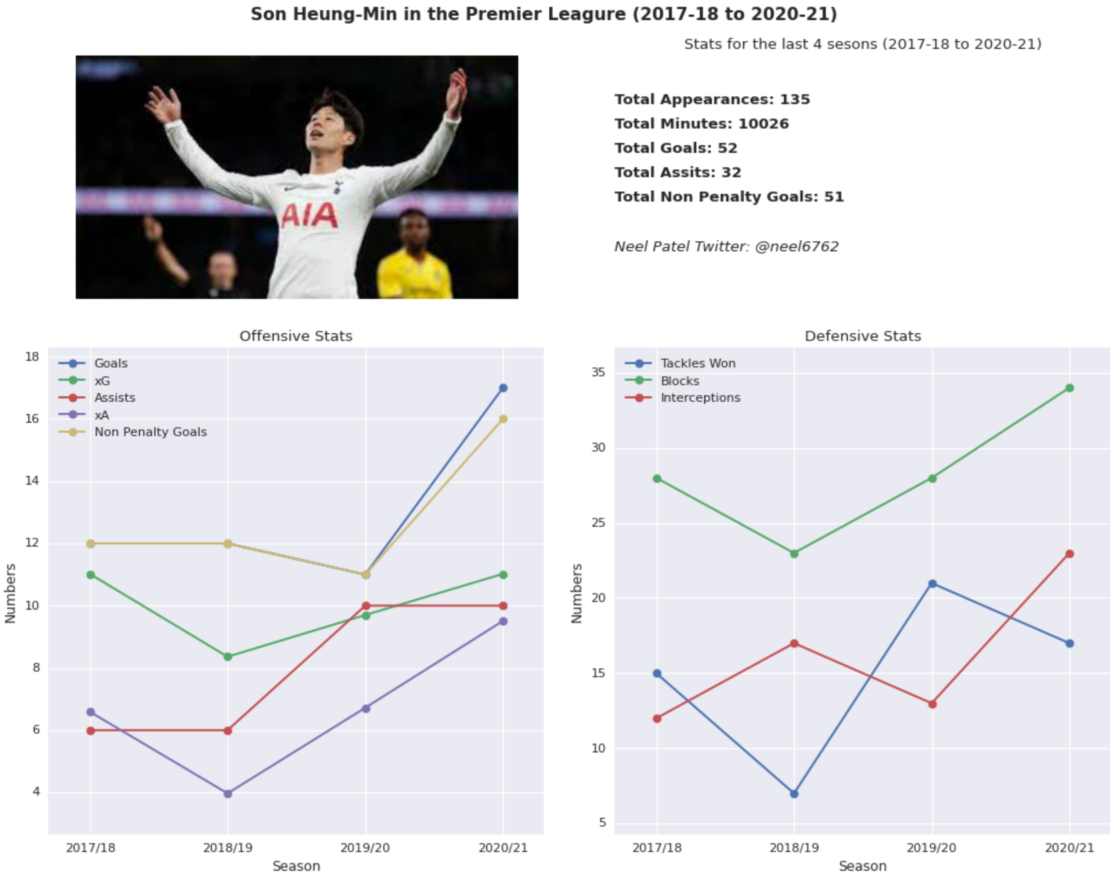
Total Appearances: 129
Total Minutes: 11223
Total Goals: 88
Total Assits: 22
Total Non Penalty Goals: 76

Neel Patel Twitter: @neel6762

0.0.9 SON

```
[12]: generatePlot("Son Heung-Min", "son.jpeg")
```

```
<Figure size 640x440 with 0 Axes>
```



Son Heung-Min in the Premier League (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

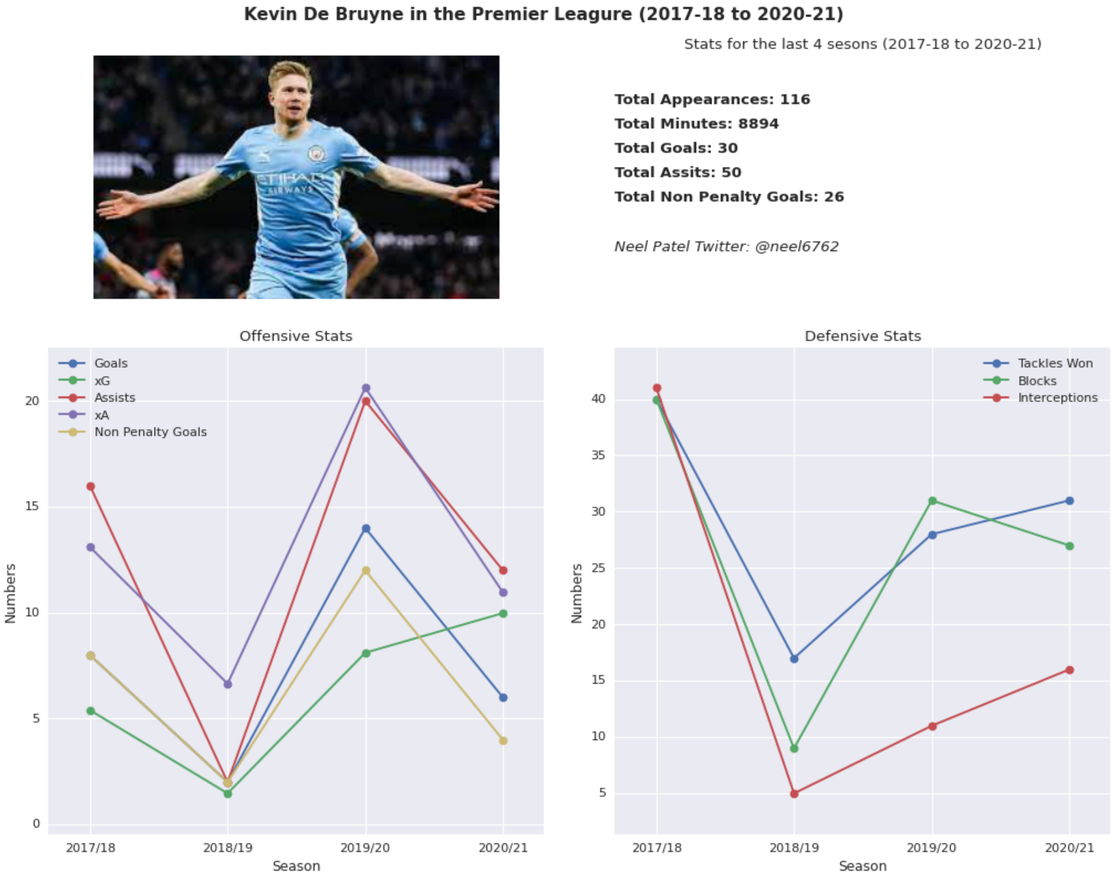
Total Appearances: 135
Total Minutes: 10026
Total Goals: 52
Total Assits: 32
Total Non Penalty Goals: 51

Neel Patel Twitter: @neel6762

0.0.10 KVD

[13]:
```
generatePlot("Kevin De Bruyne", "kdb.jpeg")
```

```
<Figure size 640x440 with 0 Axes>
```



Kevin De Bruyne in the Premier League (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

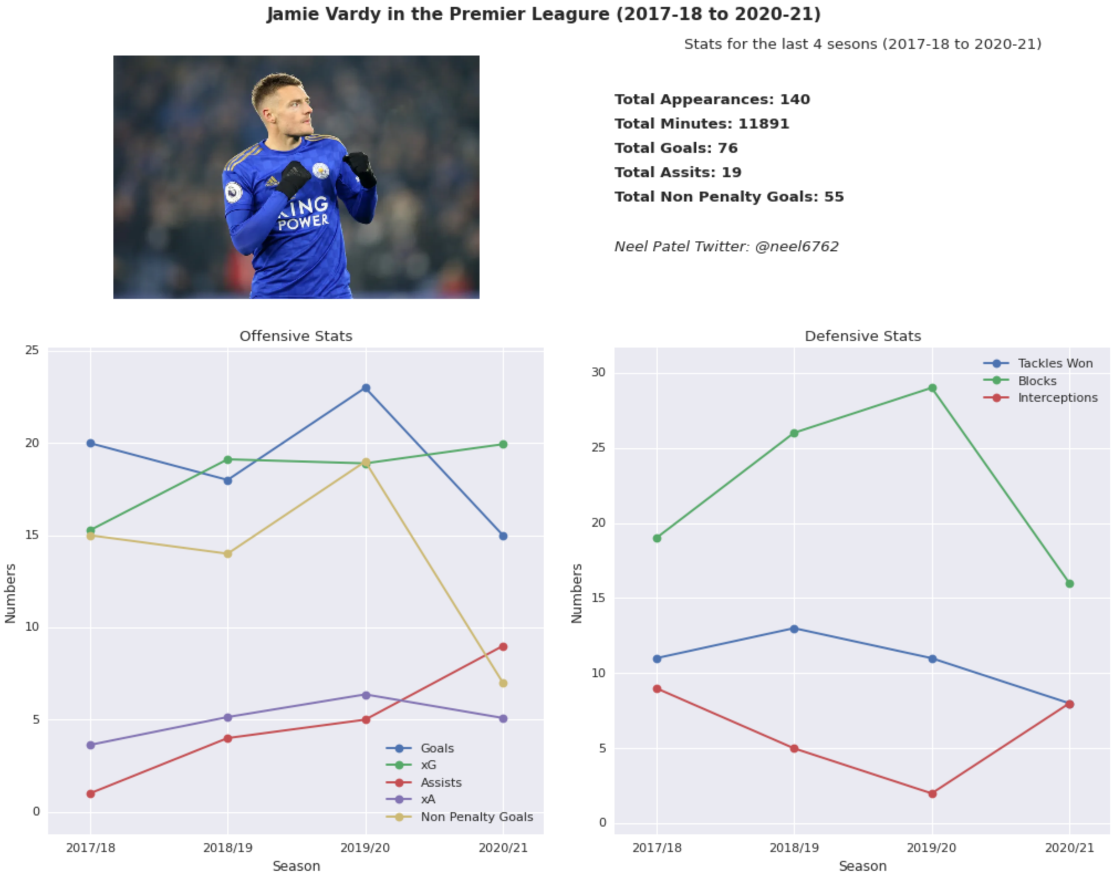
Total Appearances: 116
Total Minutes: 8894
Total Goals: 30
Total Assits: 50
Total Non Penalty Goals: 26

Neel Patel Twitter: @neel6762

0.0.11 Jamie Vardy

[14]:
```
generatePlot("Jamie Vardy", "vardy.webp")
```

```
<Figure size 640x440 with 0 Axes>
```



Jamie Vardy in the Premier League (2017-18 to 2020-21)

Stats for the last 4 sesons (2017-18 to 2020-21)

Total Appearances: 140
Total Minutes: 11891
Total Goals: 76
Total Assits: 19
Total Non Penalty Goals: 55

Neel Patel Twitter: @neel6762

0.0.12 Other Stats

[15]:
```
def getTopStats(metric):
    """Prints the top metric stat for each season

    Args:
        metric (str): the metric whose stat is to be discovered like: goals,␣
↪assists
    """

    data = [df1, df2, df3, df4]

    for df in data:
        max_stat = max(df[metric])
        player = df.query(metric + " == @max_stat")["name"].values[0]
        print(player, max_stat)
```

Top key passes for each season

[16]:

```
getTopStats("key_passes")
```

```
Kevin De Bruyne 105.0
James Maddison 100.0
Kevin De Bruyne 133.0
Bruno Fernandes 95.0
```

Top goal scrorer each season

[17]:

```
getTopStats("goals")
```

```
Mohamed Salah 32.0
Pierre-Emerick Aubameyang 22.0
Jamie Vardy 23.0
Harry Kane 23.0
```

Top assists

[18]:

```
getTopStats("assists")
```

```
Kevin De Bruyne 16.0
Eden Hazard 15.0
Kevin De Bruyne 20.0
Harry Kane 14.0
```

Highesh shots taken

[19]:

```
getTopStats("shots")
```

```
Harry Kane 183.0
Mohamed Salah 137.0
Mohamed Salah 132.0
Harry Kane 138.0
```

Blocks

[20]:

```
getTopStats("Blocks")
```

```
Kyle Naughton 104.0
Charlie Taylor 128.0
Aaron Wan-Bissaka 101.0
Aaron Wan-Bissaka 113.0
```

Tackles Won

[21]:

```
getTopStats("TklW")
```

```
Idrissa Gueye 89.0
Wilfred Ndidi 114.0
Declan Rice 89.0
Pierre-Emile HÃ¸jbjerg 82.0
```

Progressive Passes Attempted

```
[22]: getTopStats("PPA")
```

```
Kevin De Bruyne 122.0
Eden Hazard 99.0
Kevin De Bruyne 121.0
Trent Alexander-Arnold 101.0
```

Interceptions

```
[23]: getTopStats("Int")
```

```
Lewis Dunk 95.0
Aaron Wan-Bissaka 91.0
Harry Maguire 55.0
Jan Bednarek 78.0
```

Passes completed

```
[24]: getTopStats("Cmp")
```

```
NicolÃ¡s Otamendi 2825.0
Aymeric Laporte 2786.0
Virgil van Dijk 2791.0
Andrew Robertson 2567.0
```

Red Cards

```
[25]: getTopStats("red_cards")
```

```
Wilfred Ndidi 2.0
Wes Morgan 2.0
Christian Kabasele 2.0
Lewis Dunk 2.0
```

Yellow Cards

```
[26]: getTopStats("yellow_cards")
```

```
Oriol Romeu 11.0
Etienne Capoue 14.0
Luka Milivojevic 12.0
John McGinn 12.0
```

Non Penalty Goals

```
[27]: getTopStats("npg")
```

```
Mohamed Salah 31.0
Sadio ManÃ© 22.0
```

```
Danny Ings 21.0
Harry Kane 19.0
```