

# FIFA 19 ANALYSIS

## IMPORTING MODULES

```
In [1]: ### FOR MANUPULATION
import numpy as np
import pandas as pd

### FOR VISUALIZATION
import seaborn as sns
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
import plotly as py
import plotly.graph_objs as go
import seaborn as sns
from IPython.display import display, HTML, YouTubeVideo
from collections import Counter as counter

print("Modules are imported")

Modules are imported
```

## FIFA19 COVER PHOTO

```
In [2]: plt.figure(1, figsize = (20, 15))
img = mpimg.imread("fifa19cover.jpg")
plt.imshow(img)
plt.show()
```



## LOADING DATASET

```
In [3]: df_fifa = pd.read_csv("data.csv")
df_fifa.head(50)
```

Out[3]:

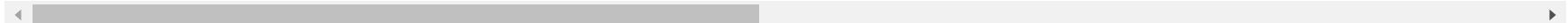
|    | Unnamed: 0 | ID     | Name              | Age | Photo   | Nationality | Flag  | Overall | I |
|----|------------|--------|-------------------|-----|---|-------------|---|---------|---|
| 0  | 0          | 158023 | L. Messi          | 31  | <a href="https://cdn.sofifa.org/players/4/19/158023.png">https://cdn.sofifa.org/players/4/19/158023.png</a> | Argentina   | <a href="https://cdn.sofifa.org/flags/52.png">https://cdn.sofifa.org/flags/52.png</a> | 94      | 9 |
| 1  | 1          | 20801  | Cristiano Ronaldo | 33  | <a href="https://cdn.sofifa.org/players/4/19/20801.png">https://cdn.sofifa.org/players/4/19/20801.png</a>   | Portugal    | <a href="https://cdn.sofifa.org/flags/38.png">https://cdn.sofifa.org/flags/38.png</a> | 94      | 9 |
| 2  | 2          | 190871 | Neymar Jr         | 26  | <a href="https://cdn.sofifa.org/players/4/19/190871.png">https://cdn.sofifa.org/players/4/19/190871.png</a> | Brazil      | <a href="https://cdn.sofifa.org/flags/54.png">https://cdn.sofifa.org/flags/54.png</a> | 92      | 9 |
| 3  | 3          | 193080 | De Gea            | 27  | <a href="https://cdn.sofifa.org/players/4/19/193080.png">https://cdn.sofifa.org/players/4/19/193080.png</a> | Spain       | <a href="https://cdn.sofifa.org/flags/45.png">https://cdn.sofifa.org/flags/45.png</a> | 91      | 9 |
| 4  | 4          | 192985 | K. De Bruyne      | 27  | <a href="https://cdn.sofifa.org/players/4/19/192985.png">https://cdn.sofifa.org/players/4/19/192985.png</a> | Belgium     | <a href="https://cdn.sofifa.org/flags/7.png">https://cdn.sofifa.org/flags/7.png</a>   | 91      | 9 |
| 5  | 5          | 183277 | E. Hazard         | 27  | <a href="https://cdn.sofifa.org/players/4/19/183277.png">https://cdn.sofifa.org/players/4/19/183277.png</a> | Belgium     | <a href="https://cdn.sofifa.org/flags/7.png">https://cdn.sofifa.org/flags/7.png</a>   | 91      | 9 |
| 6  | 6          | 177003 | L. Modrić         | 32  | <a href="https://cdn.sofifa.org/players/4/19/177003.png">https://cdn.sofifa.org/players/4/19/177003.png</a> | Croatia     | <a href="https://cdn.sofifa.org/flags/10.png">https://cdn.sofifa.org/flags/10.png</a> | 91      | 9 |
| 7  | 7          | 176580 | L. Suárez         | 31  | <a href="https://cdn.sofifa.org/players/4/19/176580.png">https://cdn.sofifa.org/players/4/19/176580.png</a> | Uruguay     | <a href="https://cdn.sofifa.org/flags/60.png">https://cdn.sofifa.org/flags/60.png</a> | 91      | 9 |
| 8  | 8          | 155862 | Sergio Ramos      | 32  | <a href="https://cdn.sofifa.org/players/4/19/155862.png">https://cdn.sofifa.org/players/4/19/155862.png</a> | Spain       | <a href="https://cdn.sofifa.org/flags/45.png">https://cdn.sofifa.org/flags/45.png</a> | 91      | 9 |
| 9  | 9          | 200389 | J. Oblak          | 25  | <a href="https://cdn.sofifa.org/players/4/19/200389.png">https://cdn.sofifa.org/players/4/19/200389.png</a> | Slovenia    | <a href="https://cdn.sofifa.org/flags/44.png">https://cdn.sofifa.org/flags/44.png</a> | 90      | 9 |
| 10 | 10         | 188545 | R. Lewandowski    | 29  | <a href="https://cdn.sofifa.org/players/4/19/188545.png">https://cdn.sofifa.org/players/4/19/188545.png</a> | Poland      | <a href="https://cdn.sofifa.org/flags/37.png">https://cdn.sofifa.org/flags/37.png</a> | 90      | 9 |
| 11 | 11         | 182521 | T. Kroos          | 28  | <a href="https://cdn.sofifa.org/players/4/19/182521.png">https://cdn.sofifa.org/players/4/19/182521.png</a> | Germany     | <a href="https://cdn.sofifa.org/flags/21.png">https://cdn.sofifa.org/flags/21.png</a> | 90      | 9 |
| 12 | 12         | 182493 | D. Godín          | 32  | <a href="https://cdn.sofifa.org/players/4/19/182493.png">https://cdn.sofifa.org/players/4/19/182493.png</a> | Uruguay     | <a href="https://cdn.sofifa.org/flags/60.png">https://cdn.sofifa.org/flags/60.png</a> | 90      | 9 |
| 13 | 13         | 168542 | David Silva       | 32  | <a href="https://cdn.sofifa.org/players/4/19/168542.png">https://cdn.sofifa.org/players/4/19/168542.png</a> | Spain       | <a href="https://cdn.sofifa.org/flags/45.png">https://cdn.sofifa.org/flags/45.png</a> | 90      | 9 |
| 14 | 14         | 215914 | N. Kanté          | 27  | <a href="https://cdn.sofifa.org/players/4/19/215914.png">https://cdn.sofifa.org/players/4/19/215914.png</a> | France      | <a href="https://cdn.sofifa.org/flags/18.png">https://cdn.sofifa.org/flags/18.png</a> | 89      | 9 |
| 15 | 15         | 211110 | P. Dybala         | 24  | <a href="https://cdn.sofifa.org/players/4/19/211110.png">https://cdn.sofifa.org/players/4/19/211110.png</a> | Argentina   | <a href="https://cdn.sofifa.org/flags/52.png">https://cdn.sofifa.org/flags/52.png</a> | 89      | 9 |

|    | Unnamed:<br>0 | ID     | Name            | Age | Photo   | Nationality | Flag  | Overall | I |
|----|---------------|--------|-----------------|-----|---|-------------|---|---------|---|
| 16 | 16            | 202126 | H. Kane         | 24  | <a href="https://cdn.sofifa.org/players/4/19/202126.png">https://cdn.sofifa.org/players/4/19/202126.png</a> | England     | <a href="https://cdn.sofifa.org/flags/14.png">https://cdn.sofifa.org/flags/14.png</a>   | 89      | 9 |
| 17 | 17            | 194765 | A. Griezmann    | 27  | <a href="https://cdn.sofifa.org/players/4/19/194765.png">https://cdn.sofifa.org/players/4/19/194765.png</a> | France      | <a href="https://cdn.sofifa.org/flags/18.png">https://cdn.sofifa.org/flags/18.png</a>   | 89      | 9 |
| 18 | 18            | 192448 | M. ter Stegen   | 26  | <a href="https://cdn.sofifa.org/players/4/19/192448.png">https://cdn.sofifa.org/players/4/19/192448.png</a> | Germany     | <a href="https://cdn.sofifa.org/flags/21.png">https://cdn.sofifa.org/flags/21.png</a>   | 89      | 9 |
| 19 | 19            | 192119 | T. Courtois     | 26  | <a href="https://cdn.sofifa.org/players/4/19/192119.png">https://cdn.sofifa.org/players/4/19/192119.png</a> | Belgium     | <a href="https://cdn.sofifa.org/flags/7.png">https://cdn.sofifa.org/flags/7.png</a>     | 89      | 9 |
| 20 | 20            | 189511 | Sergio Busquets | 29  | <a href="https://cdn.sofifa.org/players/4/19/189511.png">https://cdn.sofifa.org/players/4/19/189511.png</a> | Spain       | <a href="https://cdn.sofifa.org/flags/45.png">https://cdn.sofifa.org/flags/45.png</a>   | 89      | 8 |
| 21 | 21            | 179813 | E. Cavani       | 31  | <a href="https://cdn.sofifa.org/players/4/19/179813.png">https://cdn.sofifa.org/players/4/19/179813.png</a> | Uruguay     | <a href="https://cdn.sofifa.org/flags/60.png">https://cdn.sofifa.org/flags/60.png</a>   | 89      | 8 |
| 22 | 22            | 167495 | M. Neuer        | 32  | <a href="https://cdn.sofifa.org/players/4/19/167495.png">https://cdn.sofifa.org/players/4/19/167495.png</a> | Germany     | <a href="https://cdn.sofifa.org/flags/21.png">https://cdn.sofifa.org/flags/21.png</a>   | 89      | 8 |
| 23 | 23            | 153079 | S. Agüero       | 30  | <a href="https://cdn.sofifa.org/players/4/19/153079.png">https://cdn.sofifa.org/players/4/19/153079.png</a> | Argentina   | <a href="https://cdn.sofifa.org/flags/52.png">https://cdn.sofifa.org/flags/52.png</a>   | 89      | 8 |
| 24 | 24            | 138956 | G. Chiellini    | 33  | <a href="https://cdn.sofifa.org/players/4/19/138956.png">https://cdn.sofifa.org/players/4/19/138956.png</a> | Italy       | <a href="https://cdn.sofifa.org/flags/27.png">https://cdn.sofifa.org/flags/27.png</a>   | 89      | 8 |
| 25 | 25            | 231747 | K. Mbappé       | 19  | <a href="https://cdn.sofifa.org/players/4/19/231747.png">https://cdn.sofifa.org/players/4/19/231747.png</a> | France      | <a href="https://cdn.sofifa.org/flags/18.png">https://cdn.sofifa.org/flags/18.png</a>   | 88      | 9 |
| 26 | 26            | 209331 | M. Salah        | 26  | <a href="https://cdn.sofifa.org/players/4/19/209331.png">https://cdn.sofifa.org/players/4/19/209331.png</a> | Egypt       | <a href="https://cdn.sofifa.org/flags/111.png">https://cdn.sofifa.org/flags/111.png</a> | 88      | 8 |
| 27 | 27            | 200145 | Casemiro        | 26  | <a href="https://cdn.sofifa.org/players/4/19/200145.png">https://cdn.sofifa.org/players/4/19/200145.png</a> | Brazil      | <a href="https://cdn.sofifa.org/flags/54.png">https://cdn.sofifa.org/flags/54.png</a>   | 88      | 9 |
| 28 | 28            | 198710 | J. Rodríguez    | 26  | <a href="https://cdn.sofifa.org/players/4/19/198710.png">https://cdn.sofifa.org/players/4/19/198710.png</a> | Colombia    | <a href="https://cdn.sofifa.org/flags/56.png">https://cdn.sofifa.org/flags/56.png</a>   | 88      | 8 |
| 29 | 29            | 198219 | L. Insigne      | 27  | <a href="https://cdn.sofifa.org/players/4/19/198219.png">https://cdn.sofifa.org/players/4/19/198219.png</a> | Italy       | <a href="https://cdn.sofifa.org/flags/27.png">https://cdn.sofifa.org/flags/27.png</a>   | 88      | 8 |
| 30 | 30            | 197781 | Isco            | 26  | <a href="https://cdn.sofifa.org/players/4/19/197781.png">https://cdn.sofifa.org/players/4/19/197781.png</a> | Spain       | <a href="https://cdn.sofifa.org/flags/45.png">https://cdn.sofifa.org/flags/45.png</a>   | 88      | 9 |
| 31 | 31            | 190460 | C. Eriksen      | 26  | <a href="https://cdn.sofifa.org/players/4/19/190460.png">https://cdn.sofifa.org/players/4/19/190460.png</a> | Denmark     | <a href="https://cdn.sofifa.org/flags/13.png">https://cdn.sofifa.org/flags/13.png</a>   | 88      | 9 |

|    | Unnamed:<br>0 | ID     | Name          | Age | Photo   | Nationality | Flag  | Overall | I |
|----|---------------|--------|---------------|-----|---|-------------|---|---------|---|
| 32 | 32            | 189242 | Coutinho      | 26  | <a href="https://cdn.sofifa.org/players/4/19/189242.png">https://cdn.sofifa.org/players/4/19/189242.png</a> | Brazil      | <a href="https://cdn.sofifa.org/flags/54.png">https://cdn.sofifa.org/flags/54.png</a>   | 88      | 8 |
| 33 | 33            | 188567 | P. Aubameyang | 29  | <a href="https://cdn.sofifa.org/players/4/19/188567.png">https://cdn.sofifa.org/players/4/19/188567.png</a> | Gabon       | <a href="https://cdn.sofifa.org/flags/115.png">https://cdn.sofifa.org/flags/115.png</a> | 88      | 8 |
| 34 | 34            | 178603 | M. Hummels    | 29  | <a href="https://cdn.sofifa.org/players/4/19/178603.png">https://cdn.sofifa.org/players/4/19/178603.png</a> | Germany     | <a href="https://cdn.sofifa.org/flags/21.png">https://cdn.sofifa.org/flags/21.png</a>   | 88      | 8 |
| 35 | 35            | 176676 | Marcelo       | 30  | <a href="https://cdn.sofifa.org/players/4/19/176676.png">https://cdn.sofifa.org/players/4/19/176676.png</a> | Brazil      | <a href="https://cdn.sofifa.org/flags/54.png">https://cdn.sofifa.org/flags/54.png</a>   | 88      | 8 |
| 36 | 36            | 173731 | G. Bale       | 28  | <a href="https://cdn.sofifa.org/players/4/19/173731.png">https://cdn.sofifa.org/players/4/19/173731.png</a> | Wales       | <a href="https://cdn.sofifa.org/flags/50.png">https://cdn.sofifa.org/flags/50.png</a>   | 88      | 8 |
| 37 | 37            | 167948 | H. Lloris     | 31  | <a href="https://cdn.sofifa.org/players/4/19/167948.png">https://cdn.sofifa.org/players/4/19/167948.png</a> | France      | <a href="https://cdn.sofifa.org/flags/18.png">https://cdn.sofifa.org/flags/18.png</a>   | 88      | 8 |
| 38 | 38            | 167664 | G. Higuaín    | 30  | <a href="https://cdn.sofifa.org/players/4/19/167664.png">https://cdn.sofifa.org/players/4/19/167664.png</a> | Argentina   | <a href="https://cdn.sofifa.org/flags/52.png">https://cdn.sofifa.org/flags/52.png</a>   | 88      | 8 |
| 39 | 39            | 164240 | Thiago Silva  | 33  | <a href="https://cdn.sofifa.org/players/4/19/164240.png">https://cdn.sofifa.org/players/4/19/164240.png</a> | Brazil      | <a href="https://cdn.sofifa.org/flags/54.png">https://cdn.sofifa.org/flags/54.png</a>   | 88      | 8 |
| 40 | 40            | 162835 | S. Handanović | 33  | <a href="https://cdn.sofifa.org/players/4/19/162835.png">https://cdn.sofifa.org/players/4/19/162835.png</a> | Slovenia    | <a href="https://cdn.sofifa.org/flags/44.png">https://cdn.sofifa.org/flags/44.png</a>   | 88      | 8 |
| 41 | 41            | 1179   | G. Buffon     | 40  | <a href="https://cdn.sofifa.org/players/4/19/1179.png">https://cdn.sofifa.org/players/4/19/1179.png</a>     | Italy       | <a href="https://cdn.sofifa.org/flags/27.png">https://cdn.sofifa.org/flags/27.png</a>   | 88      | 8 |
| 42 | 42            | 205600 | S. Umtiti     | 24  | <a href="https://cdn.sofifa.org/players/4/19/205600.png">https://cdn.sofifa.org/players/4/19/205600.png</a> | France      | <a href="https://cdn.sofifa.org/flags/18.png">https://cdn.sofifa.org/flags/18.png</a>   | 87      | 9 |
| 43 | 43            | 201399 | M. Icardi     | 25  | <a href="https://cdn.sofifa.org/players/4/19/201399.png">https://cdn.sofifa.org/players/4/19/201399.png</a> | Argentina   | <a href="https://cdn.sofifa.org/flags/52.png">https://cdn.sofifa.org/flags/52.png</a>   | 87      | 9 |
| 44 | 44            | 201024 | K. Koulibaly  | 27  | <a href="https://cdn.sofifa.org/players/4/19/201024.png">https://cdn.sofifa.org/players/4/19/201024.png</a> | Senegal     | <a href="https://cdn.sofifa.org/flags/136.png">https://cdn.sofifa.org/flags/136.png</a> | 87      | 9 |
| 45 | 45            | 195864 | P. Pogba      | 25  | <a href="https://cdn.sofifa.org/players/4/19/195864.png">https://cdn.sofifa.org/players/4/19/195864.png</a> | France      | <a href="https://cdn.sofifa.org/flags/18.png">https://cdn.sofifa.org/flags/18.png</a>   | 87      | 9 |
| 46 | 46            | 193041 | K. Navas      | 31  | <a href="https://cdn.sofifa.org/players/4/19/193041.png">https://cdn.sofifa.org/players/4/19/193041.png</a> | Costa Rica  | <a href="https://cdn.sofifa.org/flags/72.png">https://cdn.sofifa.org/flags/72.png</a>   | 87      | 8 |
| 47 | 47            | 192505 | R. Lukaku     | 25  | <a href="https://cdn.sofifa.org/players/4/19/192505.png">https://cdn.sofifa.org/players/4/19/192505.png</a> | Belgium     | <a href="https://cdn.sofifa.org/flags/7.png">https://cdn.sofifa.org/flags/7.png</a>     | 87      | 8 |
| 48 | 48            | 192387 | C. Immobile   | 28  | <a href="https://cdn.sofifa.org/players/4/19/192387.png">https://cdn.sofifa.org/players/4/19/192387.png</a> | Italy       | <a href="https://cdn.sofifa.org/flags/27.png">https://cdn.sofifa.org/flags/27.png</a>   | 87      | 8 |

|    | Unnamed:<br>0 | ID     | Name       | Age |   | Photo | Nationality   |    | Flag | Overall | I |
|----|---------------|--------|------------|-----|---|-------|---|----|------|---------|---|
| 49 | 49            | 189332 | Jordi Alba | 29  | <a href="https://cdn.sofifa.org/players/4/19/189332.png">https://cdn.sofifa.org/players/4/19/189332.png</a> | Spain | <a href="https://cdn.sofifa.org/flags/45.png">https://cdn.sofifa.org/flags/45.png</a> | 87 | 8    |         |   |

50 rows × 89 columns



### SHAPE OF DATASET(ROW, COLUMNS)

```
In [4]: df_fifa.shape
```

```
Out[4]: (18207, 89)
```

### DROPPING UNNECESSARY COLUMNS

```
In [5]: useless_cols = ["ID", "Unnamed: 0", "Photo", "Flag", "Club Logo", "Special", "Body Type", "Real Face", "Joined", "Loaned From",
                     "Contract Valid Until", "Weight", "LS", "ST", "RS", "LW", "LF", "CF", "RF", "RW", "LAM", "CAM", "RAM", "LM",
                     ,
                     "LCM", "CM", "RCM", "RM", "LWB", "LDM", "CDM", "RDM", "RWB", "LB", "LCB", "CB", "RCB", "RB", "Release Clause"]
df_fifa.drop(useless_cols, axis=1, inplace=True)
df_fifa.head(10)
```

Out[5]:

|   | Name              | Age | Nationality | Overall | Potential | Club                | Value   | Wage  | Preferred Foot | International Reputation | ... | Penalties | Composure | Marking | Sta |
|---|-------------------|-----|-------------|---------|-----------|---------------------|---------|-------|----------------|--------------------------|-----|-----------|-----------|---------|-----|
| 0 | L. Messi          | 31  | Argentina   | 94      | 94        | FC Barcelona        | €110.5M | €565K | Left           | 5.0                      | ... | 75.0      | 96.0      | 33.0    | 28. |
| 1 | Cristiano Ronaldo | 33  | Portugal    | 94      | 94        | Juventus            | €77M    | €405K | Right          | 5.0                      | ... | 85.0      | 95.0      | 28.0    | 31. |
| 2 | Neymar Jr         | 26  | Brazil      | 92      | 93        | Paris Saint-Germain | €118.5M | €290K | Right          | 5.0                      | ... | 81.0      | 94.0      | 27.0    | 24. |
| 3 | De Gea            | 27  | Spain       | 91      | 93        | Manchester United   | €72M    | €260K | Right          | 4.0                      | ... | 40.0      | 68.0      | 15.0    | 21. |
| 4 | K. De Bruyne      | 27  | Belgium     | 91      | 92        | Manchester City     | €102M   | €355K | Right          | 4.0                      | ... | 79.0      | 88.0      | 68.0    | 58. |
| 5 | E. Hazard         | 27  | Belgium     | 91      | 91        | Chelsea             | €93M    | €340K | Right          | 4.0                      | ... | 86.0      | 91.0      | 34.0    | 27. |
| 6 | L. Modrić         | 32  | Croatia     | 91      | 91        | Real Madrid         | €67M    | €420K | Right          | 4.0                      | ... | 82.0      | 84.0      | 60.0    | 76. |
| 7 | L. Suárez         | 31  | Uruguay     | 91      | 91        | FC Barcelona        | €80M    | €455K | Right          | 5.0                      | ... | 85.0      | 85.0      | 62.0    | 45. |
| 8 | Sergio Ramos      | 32  | Spain       | 91      | 91        | Real Madrid         | €51M    | €380K | Right          | 4.0                      | ... | 75.0      | 82.0      | 87.0    | 92. |
| 9 | J. Oblak          | 25  | Slovenia    | 90      | 93        | Atlético Madrid     | €68M    | €94K  | Right          | 3.0                      | ... | 11.0      | 70.0      | 27.0    | 12. |

10 rows × 50 columns



## INFORMATION ON DATASET

```
In [6]: df_fifa.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 18207 entries, 0 to 18206
Data columns (total 50 columns):
Name           18207 non-null object
Age            18207 non-null int64
Nationality    18207 non-null object
Overall         18207 non-null int64
Potential       18207 non-null int64
Club           17966 non-null object
Value           18207 non-null object
Wage            18207 non-null object
Preferred Foot 18159 non-null object
International Reputation 18159 non-null float64
Weak Foot       18159 non-null float64
Skill Moves     18159 non-null float64
Work Rate        18159 non-null object
Position         18147 non-null object
Jersey Number   18147 non-null float64
Height           18159 non-null object
Crossing         18159 non-null float64
Finishing        18159 non-null float64
HeadingAccuracy 18159 non-null float64
ShortPassing    18159 non-null float64
Volleys          18159 non-null float64
Dribbling        18159 non-null float64
Curve            18159 non-null float64
FKAccuracy      18159 non-null float64
LongPassing     18159 non-null float64
BallControl      18159 non-null float64
Acceleration     18159 non-null float64
SprintSpeed      18159 non-null float64
Agility           18159 non-null float64
Reactions         18159 non-null float64
Balance           18159 non-null float64
ShotPower         18159 non-null float64
Jumping           18159 non-null float64
Stamina           18159 non-null float64
Strength          18159 non-null float64
LongShots         18159 non-null float64
Aggression        18159 non-null float64
Interceptions    18159 non-null float64
Positioning       18159 non-null float64
Vision            18159 non-null float64
Penalties          18159 non-null float64
Composure          18159 non-null float64
Marking            18159 non-null float64
StandingTackle    18159 non-null float64
SlidingTackle     18159 non-null float64
```

```
GKDiving          18159 non-null float64
GKHandling        18159 non-null float64
GKKicking          18159 non-null float64
GKPositioning     18159 non-null float64
GKReflexes         18159 non-null float64
dtypes: float64(38), int64(3), object(9)
memory usage: 6.3+ MB
```

## STATISTICS ON DATASET

In [7]: `df_fifa.describe()`

Out[7]:

|              | Age          | Overall      | Potential    | International Reputation | Weak Foot    | Skill Moves  | Jersey Number | Crossing     | Finishing    | H            |
|--------------|--------------|--------------|--------------|--------------------------|--------------|--------------|---------------|--------------|--------------|--------------|
| <b>count</b> | 18207.000000 | 18207.000000 | 18207.000000 | 18159.000000             | 18159.000000 | 18159.000000 | 18147.000000  | 18159.000000 | 18159.000000 | 18159.000000 |
| <b>mean</b>  | 25.122206    | 66.238699    | 71.307299    | 1.113222                 | 2.947299     | 2.361308     | 19.546096     | 49.734181    | 45.550911    | 5.5          |
| <b>std</b>   | 4.669943     | 6.908930     | 6.136496     | 0.394031                 | 0.660456     | 0.756164     | 15.947765     | 18.364524    | 19.525820    | 1.1          |
| <b>min</b>   | 16.000000    | 46.000000    | 48.000000    | 1.000000                 | 1.000000     | 1.000000     | 1.000000      | 5.000000     | 2.000000     | 4.           |
| <b>25%</b>   | 21.000000    | 62.000000    | 67.000000    | 1.000000                 | 3.000000     | 2.000000     | 8.000000      | 38.000000    | 30.000000    | 4.           |
| <b>50%</b>   | 25.000000    | 66.000000    | 71.000000    | 1.000000                 | 3.000000     | 2.000000     | 17.000000     | 54.000000    | 49.000000    | 5.           |
| <b>75%</b>   | 28.000000    | 71.000000    | 75.000000    | 1.000000                 | 3.000000     | 3.000000     | 26.000000     | 64.000000    | 62.000000    | 6.           |
| <b>max</b>   | 45.000000    | 94.000000    | 95.000000    | 5.000000                 | 5.000000     | 5.000000     | 99.000000     | 93.000000    | 95.000000    | 9.           |

8 rows × 41 columns

## ELEMENTS IN DATASETS

```
In [8]: df_fifa.nunique()
```

```
Out[8]: Name          17194
Age              29
Nationality      164
Overall           48
Potential         47
Club              651
Value             217
Wage              144
Preferred Foot    2
International Reputation 5
Weak Foot          5
Skill Moves        5
Work Rate          9
Position           27
Jersey Number     99
Height             21
Crossing           89
Finishing          93
HeadingAccuracy   91
ShortPassing       85
Volleys            87
Dribbling          94
Curve              89
FKAccuracy         90
LongPassing        84
BallControl        90
Acceleration       86
SprintSpeed        85
Agility             81
Reactions           68
Balance             81
ShotPower           92
Jumping             74
Stamina             85
Strength            74
LongShots           92
Aggression          85
Interceptions      89
Positioning         94
Vision              85
Penalties           87
Composure           84
Marking             92
StandingTackle      90
SlidingTackle       88
GKDiving            71
GKHandling          70
GKKicking           79
```

```
GKPositioning      79
GKReflexes        76
dtype: int64
```

## EXPLORATORY DATA ANALYSIS

### HIGHEST RATED PLAYERS IN FIFA19

```
In [9]: df_fifa.sort_values(by = "Overall", ascending = False)[["Name", "Position", "Nationality", "Club", "Age", "Overall"]].head()
```

Out[9]:

|   | Name              | Position | Nationality | Club                | Age | Overall |
|---|-------------------|----------|-------------|---------------------|-----|---------|
| 0 | L. Messi          | RF       | Argentina   | FC Barcelona        | 31  | 94      |
| 1 | Cristiano Ronaldo | ST       | Portugal    | Juventus            | 33  | 94      |
| 2 | Neymar Jr         | LW       | Brazil      | Paris Saint-Germain | 26  | 92      |
| 3 | De Gea            | GK       | Spain       | Manchester United   | 27  | 91      |
| 4 | K. De Bruyne      | RCM      | Belgium     | Manchester City     | 27  | 91      |

### LOWEST RATED PLAYERS IN FIFA19

```
In [10]: df_fifa.sort_values(by = "Overall", ascending = True)[["Name", "Position", "Nationality", "Club", "Age", "Overall"]].head()
```

Out[10]:

|       | Name         | Position | Nationality | Club               | Age | Overall |
|-------|--------------|----------|-------------|--------------------|-----|---------|
| 18206 | G. Nugent    | CM       | England     | Tranmere Rovers    | 16  | 46      |
| 18186 | Zhang Yufeng | CM       | China PR    | Beijing Renhe FC   | 20  | 47      |
| 18187 | C. Ehlich    | RB       | Germany     | SpVgg Unterhaching | 19  | 47      |
| 18188 | L. Collins   | CM       | Wales       | Newport County     | 17  | 47      |
| 18189 | A. Kaltner   | ST       | Germany     | SpVgg Unterhaching | 18  | 47      |

### PLAYERS WITH BEST POTENTIAL

```
In [11]: df_fifa.sort_values(by = "Potential", ascending = False)[["Name", "Position", "Potential", "Club", "Age", "Overall"]].head()
```

Out[11]:

|    | Name              | Position | Potential | Club                | Age | Overall |
|----|-------------------|----------|-----------|---------------------|-----|---------|
| 25 | K. Mbappé         | RM       | 95        | Paris Saint-Germain | 19  | 88      |
| 0  | L. Messi          | RF       | 94        | FC Barcelona        | 31  | 94      |
| 15 | P. Dybala         | LF       | 94        | Juventus            | 24  | 89      |
| 1  | Cristiano Ronaldo | ST       | 94        | Juventus            | 33  | 94      |
| 2  | Neymar Jr         | LW       | 93        | Paris Saint-Germain | 26  | 92      |

## OLDEST PLAYERS

```
In [12]: df_fifa.sort_values(by = "Age", ascending = False)[["Name", "Position", "Potential", "Club", "Age", "Overall"]].head()
```

Out[12]:

|       | Name          | Position | Potential | Club                         | Age | Overall |
|-------|---------------|----------|-----------|------------------------------|-----|---------|
| 4741  | O. Pérez      | GK       | 71        | Pachuca                      | 45  | 71      |
| 18183 | K. Pilkington | GK       | 48        | Cambridge United             | 44  | 48      |
| 17726 | T. Warner     | GK       | 53        | Accrington Stanley           | 44  | 53      |
| 10545 | S. Narazaki   | GK       | 65        | Nagoya Grampus               | 42  | 65      |
| 7225  | C. Muñoz      | GK       | 68        | CD Universidad de Concepción | 41  | 68      |

## YOUNGEST PLAYERS

In [13]: `df_fifa.sort_values(by = "Age", ascending = True)[["Name", "Position", "Potential", "Club", "Age", "Overall"]].head()`

Out[13]:

|       | Name        | Position | Potential | Club            | Age | Overall |
|-------|-------------|----------|-----------|-----------------|-----|---------|
| 18206 | G. Nugent   | CM       | 66        | Tranmere Rovers | 16  | 46      |
| 17743 | J. Olstad   | ST       | 69        | Sarpsborg 08 FF | 16  | 52      |
| 13293 | H. Massengo | CDM      | 75        | AS Monaco       | 16  | 62      |
| 16081 | J. Italiano | LM       | 79        | Perth Glory     | 16  | 58      |
| 18166 | N. Ayéva    | ST       | 72        | Örebro SK       | 16  | 48      |

## PLAYERS WITH BEST SHOTPOWER

In [14]: `df_fifa.sort_values(by = "ShotPower", ascending = False)[["Name", "Club", "Position", "ShotPower", "Overall"]].head()`

Out[14]:

|      | Name              | Club                          | Position | ShotPower | Overall |
|------|-------------------|-------------------------------|----------|-----------|---------|
| 1    | Cristiano Ronaldo | Juventus                      | ST       | 95.0      | 94      |
| 378  | Hulk              | Shanghai SIPG FC              | RCM      | 94.0      | 81      |
| 1348 | F. Guarín         | Shanghai Greenland Shenhua FC | LDM      | 93.0      | 76      |
| 890  | L. Podolski       | Vissel Kobe                   | RF       | 92.0      | 78      |
| 36   | G. Bale           | Real Madrid                   | ST       | 92.0      | 88      |

## BEST DRIBBLERS IN THE GAME

```
In [15]: df_fifa.sort_values(by = "Dribbling", ascending = False)[["Name", "Club", "Position", "Dribbling", "Overall"]].head()
```

Out[15]:

|    | Name       | Club                | Position | Dribbling | Overall |
|----|------------|---------------------|----------|-----------|---------|
| 0  | L. Messi   | FC Barcelona        | RF       | 97.0      | 94      |
| 2  | Neymar Jr  | Paris Saint-Germain | LW       | 96.0      | 92      |
| 5  | E. Hazard  | Chelsea             | LF       | 95.0      | 91      |
| 30 | Isco       | Real Madrid         | LW       | 94.0      | 88      |
| 94 | Y. Brahimi | FC Porto            | LM       | 93.0      | 85      |

## BEST CROSSERS OF THE BALL

```
In [16]: df_fifa.sort_values(by = "Crossing", ascending = False)[["Name", "Club", "Position", "Crossing", "Overall"]].head()
```

Out[16]:

|     | Name         | Club              | Position | Crossing | Overall |
|-----|--------------|-------------------|----------|----------|---------|
| 4   | K. De Bruyne | Manchester City   | RCM      | 93.0     | 91      |
| 153 | Quaresma     | Beşiktaş JK       | RM       | 92.0     | 84      |
| 390 | Pedro León   | SD Eibar          | RM       | 91.0     | 81      |
| 290 | K. Trippier  | Tottenham Hotspur | RB       | 91.0     | 82      |
| 291 | A. Kolarov   | Roma              | LB       | 91.0     | 82      |

## BEST FREEKICK TAKERS

In [17]: `df_fifa.sort_values(by = "FKAccuracy", ascending = False)[["Name", "Club", "Position", "FKAccuracy", "Overall"]].head()`

Out[17]:

|      | Name          | Club         | Position | FKAccuracy | Overall |
|------|---------------|--------------|----------|------------|---------|
| 0    | L. Messi      | FC Barcelona | RF       | 94.0       | 94      |
| 293  | S. Giovinco   | Toronto FC   | CF       | 93.0       | 82      |
| 72   | M. Pjanić     | Juventus     | CDM      | 92.0       | 86      |
| 1113 | E. Bardhi     | Levante UD   | LCM      | 91.0       | 77      |
| 449  | H. Çalhanoglu | Milan        | CAM      | 90.0       | 80      |

#### PLAYERS HAVING BEST BALL CONTROL

In [18]: `df_fifa.sort_values(by = "BallControl", ascending = False)[["Name", "Club", "Position", "BallControl", "Overall"]].head()`

Out[18]:

|    | Name              | Club                | Position | BallControl | Overall |
|----|-------------------|---------------------|----------|-------------|---------|
| 0  | L. Messi          | FC Barcelona        | RF       | 96.0        | 94      |
| 2  | Neymar Jr         | Paris Saint-Germain | LW       | 95.0        | 92      |
| 30 | Isco              | Real Madrid         | LW       | 95.0        | 88      |
| 5  | E. Hazard         | Chelsea             | LF       | 94.0        | 91      |
| 1  | Cristiano Ronaldo | Juventus            | ST       | 94.0        | 94      |

#### PLAYERS WITH BEST VISION

```
In [19]: df_fifa.sort_values(by = "Vision" , ascending = False)[["Name", "Club", "Nationality", "Vision", "Overall"]].head()
```

Out[19]:

|    | Name         | Club            | Nationality | Vision | Overall |
|----|--------------|-----------------|-------------|--------|---------|
| 0  | L. Messi     | FC Barcelona    | Argentina   | 94.0   | 94      |
| 4  | K. De Bruyne | Manchester City | Belgium     | 94.0   | 91      |
| 76 | Iniesta      | Vissel Kobe     | Spain       | 93.0   | 86      |
| 13 | David Silva  | Manchester City | Spain       | 92.0   | 90      |
| 6  | L. Modrić    | Real Madrid     | Croatia     | 92.0   | 91      |

## BEST FINISHERS

```
In [20]: df_fifa.sort_values(by = "Finishing", ascending = False)[["Name", "Club", "Position", "Finishing", "Overall"]].head()
```

Out[20]:

|    | Name              | Club              | Position | Finishing | Overall |
|----|-------------------|-------------------|----------|-----------|---------|
| 0  | L. Messi          | FC Barcelona      | RF       | 95.0      | 94      |
| 1  | Cristiano Ronaldo | Juventus          | ST       | 94.0      | 94      |
| 16 | H. Kane           | Tottenham Hotspur | ST       | 94.0      | 89      |
| 23 | S. Agüero         | Manchester City   | ST       | 93.0      | 89      |
| 7  | L. Suárez         | FC Barcelona      | RS       | 93.0      | 91      |

## PLAYERS WITH FAST ACCELERATION

```
In [21]: df_fifa.sort_values(by = "Acceleration", ascending = False)[["Name", "Club", "Position", "Acceleration", "Overall"]].head()
```

Out[21]:

|             | Name          | Club                    | Position | Acceleration | Overall |
|-------------|---------------|-------------------------|----------|--------------|---------|
| <b>1968</b> | Adama         | Wolverhampton Wanderers | RW       | 97.0         | 75      |
| <b>65</b>   | Douglas Costa | Juventus                | LM       | 97.0         | 86      |
| <b>5886</b> | K. Manneh     | FC St. Gallen           | LM       | 96.0         | 69      |
| <b>25</b>   | K. Mbappé     | Paris Saint-Germain     | RM       | 96.0         | 88      |
| <b>2587</b> | J. Biabiany   | Parma                   | RW       | 95.0         | 74      |

## BEST SPRINTERS

```
In [22]: df_fifa.sort_values(by = "SprintSpeed", ascending = False)[["Name", "Club", "Position", "SprintSpeed", "Overall"]].head()
```

Out[22]:

|             | Name      | Club                    | Position | SprintSpeed | Overall |
|-------------|-----------|-------------------------|----------|-------------|---------|
| <b>1968</b> | Adama     | Wolverhampton Wanderers | RW       | 96.0        | 75      |
| <b>55</b>   | L. Sané   | Manchester City         | LW       | 96.0        | 86      |
| <b>25</b>   | K. Mbappé | Paris Saint-Germain     | RM       | 96.0        | 88      |
| <b>1489</b> | I. Bebou  | Hannover 96             | RM       | 95.0        | 76      |
| <b>36</b>   | G. Bale   | Real Madrid             | ST       | 95.0        | 88      |

## BEST LONG PASSERS IN THE GAME

In [23]: `df_fifa.sort_values(by = "LongPassing", ascending = False)[["Name", "Club", "Position", "LongPassing", "Overall"]].head()`

Out[23]:

|            | Name          | Club              | Position | LongPassing | Overall |
|------------|---------------|-------------------|----------|-------------|---------|
| <b>11</b>  | T. Kroos      | Real Madrid       | LCM      | 93.0        | 90      |
| <b>4</b>   | K. De Bruyne  | Manchester City   | RCM      | 91.0        | 91      |
| <b>45</b>  | P. Pogba      | Manchester United | RDM      | 90.0        | 87      |
| <b>53</b>  | I. Rakitić    | FC Barcelona      | RCM      | 90.0        | 87      |
| <b>219</b> | Cesc Fàbregas | Chelsea           | CM       | 89.0        | 83      |

## STRONGEST PLAYERS

In [24]: `df_fifa.sort_values(by = "Strength", ascending = False)[["Name", "Club", "Position", "Strength", "Overall"]].head()`

Out[24]:

|              | Name         | Club                   | Position | Strength | Overall |
|--------------|--------------|------------------------|----------|----------|---------|
| <b>9501</b>  | A. Akinfenwa | Wycombe Wanderers      | LS       | 97.0     | 66      |
| <b>1124</b>  | Wesley       | Club Brugge KV         | LS       | 95.0     | 77      |
| <b>2559</b>  | K. Waston    | Vancouver Whitecaps FC | RCB      | 95.0     | 74      |
| <b>14111</b> | T. Chorý     | Viktoria Plzeň         | ST       | 95.0     | 61      |
| <b>15179</b> | M. Rhead     | Lincoln City           | ST       | 94.0     | 60      |

## MOST AGGRESSIVE PLAYERS

In [25]: `df_fifa.sort_values(by = "Aggression", ascending = False)[["Name", "Club", "Position", "Aggression", "Overall"]].head()`

Out[25]:

|              | Name       | Club              | Position | Aggression | Overall |
|--------------|------------|-------------------|----------|------------|---------|
| <b>1948</b>  | B. Pearson | Preston North End | RDM      | 95.0       | 75      |
| <b>9512</b>  | D. Erdmann | 1. FC Magdeburg   | CB       | 94.0       | 66      |
| <b>940</b>   | Gazzolisco | Internacional     | LB       | 94.0       | 77      |
| <b>16919</b> | D. Pipe    | Newport County    | RWB      | 94.0       | 56      |
| <b>4037</b>  | J. Garner  | Wigan Athletic    | ST       | 94.0       | 71      |

### BEST GOAL KEEPERS (REFLEXES)

In [26]: `df_fifa.sort_values(by = "GKReflexes", ascending = False)[["Name", "Club", "Position", "GKReflexes", "Overall"]].head()`

Out[26]:

|            | Name          | Club              | Position | GKReflexes | Overall |
|------------|---------------|-------------------|----------|------------|---------|
| <b>3</b>   | De Gea        | Manchester United | GK       | 94.0       | 91      |
| <b>37</b>  | H. Lloris     | Tottenham Hotspur | GK       | 92.0       | 88      |
| <b>18</b>  | M. ter Stegen | FC Barcelona      | GK       | 90.0       | 89      |
| <b>128</b> | M. Perin      | Juventus          | GK       | 90.0       | 84      |
| <b>46</b>  | K. Navas      | Real Madrid       | GK       | 90.0       | 87      |

### BEST GOAL KEEPERS (DIVING)

In [27]: `df_fifa.sort_values(by = "GKDiving", ascending = False)[["Name", "Club", "Position", "GKDiving", "Overall"]].head()`

Out[27]:

|           | Name      | Club                | Position | GKDiving | Overall |
|-----------|-----------|---------------------|----------|----------|---------|
| <b>22</b> | M. Neuer  | FC Bayern München   | GK       | 90.0     | 89      |
| <b>46</b> | K. Navas  | Real Madrid         | GK       | 90.0     | 87      |
| <b>3</b>  | De Gea    | Manchester United   | GK       | 90.0     | 91      |
| <b>37</b> | H. Lloris | Tottenham Hotspur   | GK       | 88.0     | 88      |
| <b>41</b> | G. Buffon | Paris Saint-Germain | GK       | 88.0     | 88      |

#### BEST DEFENDERS (SLIDING TACKLE)

In [28]: `df_fifa.sort_values(by = "SlidingTackle", ascending = False)[["Name", "Club", "Nationality", "SlidingTackle", "Overall"]].head()`

Out[28]:

|            | Name          | Club            | Nationality | SlidingTackle | Overall |
|------------|---------------|-----------------|-------------|---------------|---------|
| <b>8</b>   | Sergio Ramos  | Real Madrid     | Spain       | 91.0          | 91      |
| <b>101</b> | R. Nainggolan | Inter           | Belgium     | 90.0          | 85      |
| <b>24</b>  | G. Chiellini  | Juventus        | Italy       | 90.0          | 89      |
| <b>88</b>  | K. Manolas    | Roma            | Greece      | 89.0          | 85      |
| <b>12</b>  | D. Godín      | Atlético Madrid | Uruguay     | 89.0          | 90      |

#### BEST DEFENDERS (STANDING TACKLE)

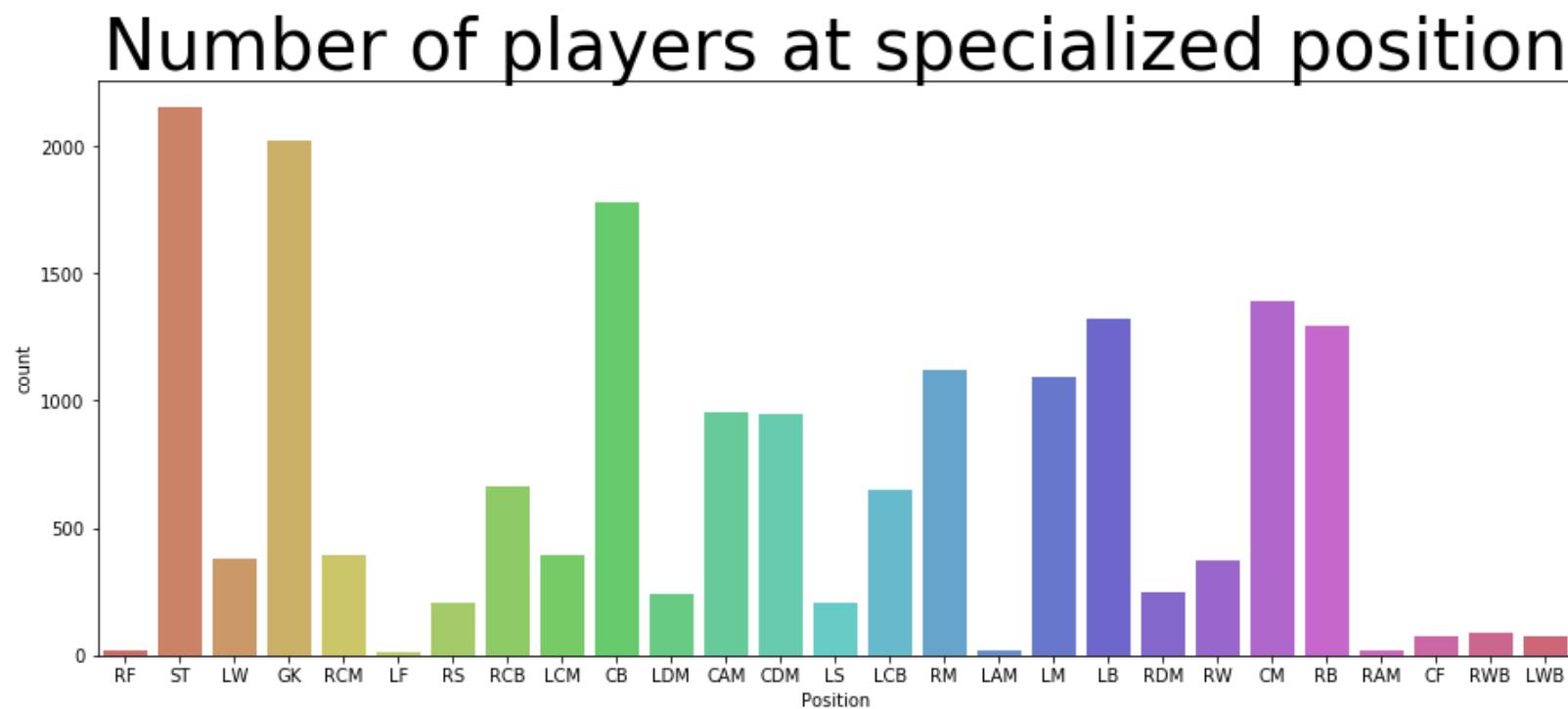
```
In [29]: df_fifa.sort_values(by = "StandingTackle", ascending = False)[["Name", "Club", "Nationality", "StandingTackle", "Overall"]].head()
```

Out[29]:

|    | Name            | Club              | Nationality | StandingTackle | Overall |
|----|-----------------|-------------------|-------------|----------------|---------|
| 24 | G. Chiellini    | Juventus          | Italy       | 93.0           | 89      |
| 8  | Sergio Ramos    | Real Madrid       | Spain       | 92.0           | 91      |
| 71 | T. Alderweireld | Tottenham Hotspur | Belgium     | 91.0           | 86      |
| 14 | N. Kanté        | Chelsea           | France      | 91.0           | 89      |
| 27 | Casemiro        | Real Madrid       | Brazil      | 90.0           | 88      |

NUMBER OF PLAYERS AT CERTAIN POSITIONS

```
In [30]: plt.figure(1, figsize = (15, 6))
pos = sns.countplot(x = "Position", data = df_fifa, palette = "hls");
pos.set_title(label="Number of players at specialized position", fontsize=40);
plt.show()
```



## BEST LEFT FOOTED PLAYERS

```
In [31]: df_fifa[df_fifa["Preferred Foot"] == "Left"][["Name", "Club", "Position", "Overall"]].head()
```

Out[31]:

|    | Name         | Club            | Position | Overall |
|----|--------------|-----------------|----------|---------|
| 0  | L. Messi     | FC Barcelona    | RF       | 94      |
| 13 | David Silva  | Manchester City | LCM      | 90      |
| 15 | P. Dybala    | Juventus        | LF       | 89      |
| 17 | A. Griezmann | Atlético Madrid | CAM      | 89      |
| 19 | T. Courtois  | Real Madrid     | GK       | 89      |

## BEST RIGHT FOOTED PLAYERS

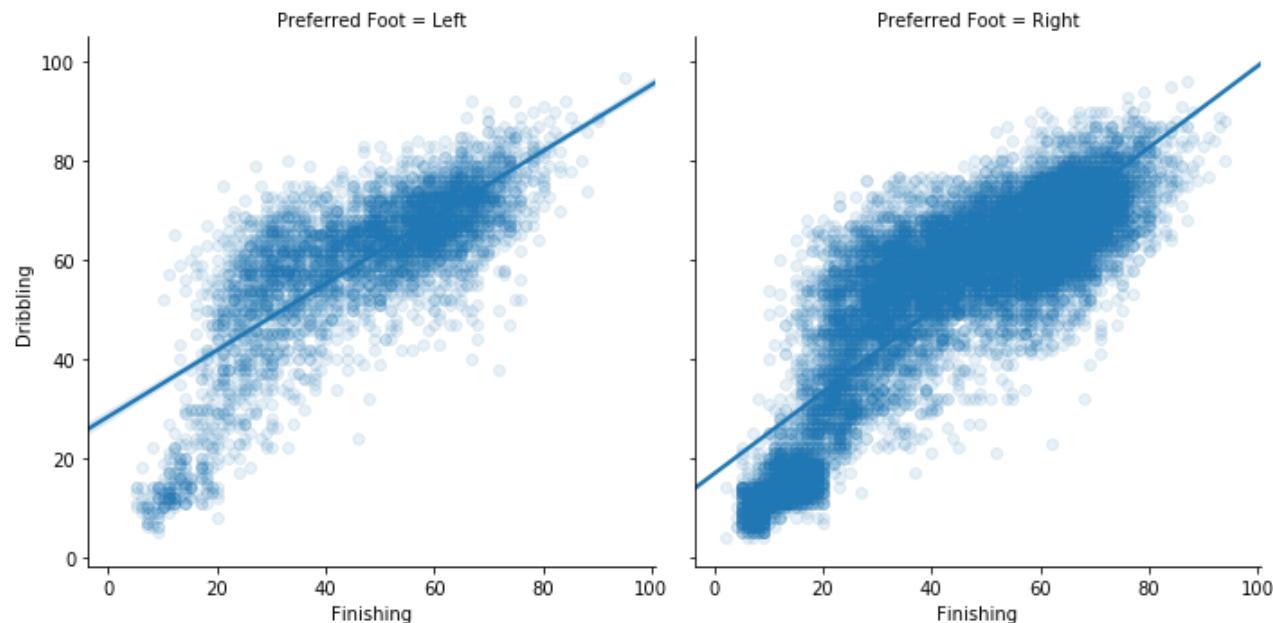
```
In [32]: df_fifa[df_fifa["Preferred Foot"] == "Right"][["Name", "Club", "Position", "Overall"]].head()
```

Out[32]:

|   | Name              | Club                | Position | Overall |
|---|-------------------|---------------------|----------|---------|
| 1 | Cristiano Ronaldo | Juventus            | ST       | 94      |
| 2 | Neymar Jr         | Paris Saint-Germain | LW       | 92      |
| 3 | De Gea            | Manchester United   | GK       | 91      |
| 4 | K. De Bruyne      | Manchester City     | RCM      | 91      |
| 5 | E. Hazard         | Chelsea             | LF       | 91      |

## COMPARISON : LEFT FOOT VS RIGHT FOOT IN TERMS OF DRIBBLING AND FINISHING

```
In [33]: sns.lmplot(x = "Finishing", y = "Dribbling", data = df_fifa, scatter_kws = {"alpha":0.1}, col = "Preferred Foot");  
plt.show()
```



ATTRIBUTES : PLAYER NAME

```
In [34]: cols = ["Crossing", "Potential", "Finishing", "HeadingAccuracy", "ShortPassing", "Volleys",
               "Dribbling", "Curve", "FKAccuracy", "LongPassing", "BallControl", "Acceleration",
               "SprintSpeed", "Agility", "Reactions", "Balance", "ShotPower", "Jumping", "Stamina",
               "Strength", "LongShots", "Aggression", "Interceptions", "Positioning", "Vision",
               "Penalties", "Composure", "Marking", "StandingTackle", "SlidingTackle", "GKDiving",
               "GKHandling", "GKKicking", "GKPositioning", "GKReflexes"]
i=0
while i < len(cols):
    print('Best {0} : {1}'.format(cols[i], df_fifa.loc[df_fifa[cols[i]].idxmax()]["Name"]))
    i += 1
```

Best Crossing : K. De Bruyne  
Best Potential : K. Mbappé  
Best Finishing : L. Messi  
Best HeadingAccuracy : Naldo  
Best ShortPassing : L. Modrić  
Best Volleys : E. Cavani  
Best Dribbling : L. Messi  
Best Curve : Quaresma  
Best FKAccuracy : L. Messi  
Best LongPassing : T. Kroos  
Best BallControl : L. Messi  
Best Acceleration : Douglas Costa  
Best SprintSpeed : K. Mbappé  
Best Agility : Neymar Jr  
Best Reactions : Cristiano Ronaldo  
Best Balance : Bernard  
Best ShotPower : Cristiano Ronaldo  
Best Jumping : Cristiano Ronaldo  
Best Stamina : N. Kanté  
Best Strength : A. Akinfenwa  
Best LongShots : L. Messi  
Best Aggression : B. Pearson  
Best Interceptions : N. Kanté  
Best Positioning : Cristiano Ronaldo  
Best Vision : L. Messi  
Best Penalties : M. Balotelli  
Best Composure : L. Messi  
Best Marking : A. Barzaglio  
Best StandingTackle : G. Chiellini  
Best SlidingTackle : Sergio Ramos  
Best GKDiving : De Gea  
Best GKHandling : J. Oblak  
Best GKKicking : M. Neuer  
Best GKPositioning : G. Buffon  
Best GKReflexes : De Gea

## BEST PLAYER AT EACH POSITION

```
In [35]: display(HTML(df_fifa.iloc[df_fifa.groupby(df_fifa["Position"])["Overall"].idxmax()][["Name", "Position"]].to_html(index=False)))
```

| Name              | Position |
|-------------------|----------|
| A. Griezmann      | CAM      |
| D. Godín          | CB       |
| Sergio Busquets   | CDM      |
| Luis Alberto      | CF       |
| Thiago            | CM       |
| De Gea            | GK       |
| J. Rodríguez      | LAM      |
| Marcelo           | LB       |
| G. Chiellini      | LCB      |
| T. Kroos          | LCM      |
| N. Kanté          | LDM      |
| E. Hazard         | LF       |
| P. Aubameyang     | LM       |
| E. Cavani         | LS       |
| Neymar Jr         | LW       |
| N. Schulz         | LWB      |
| J. Cuadrado       | RAM      |
| Azpilicueta       | RB       |
| Sergio Ramos      | RCB      |
| K. De Bruyne      | RCM      |
| P. Pogba          | RDM      |
| L. Messi          | RF       |
| K. Mbappé         | RM       |
| L. Suárez         | RS       |
| Bernardo Silva    | RW       |
| M. Ginter         | RWB      |
| Cristiano Ronaldo | ST       |

## TOP 3 FEATURES FOR EACH POSITION

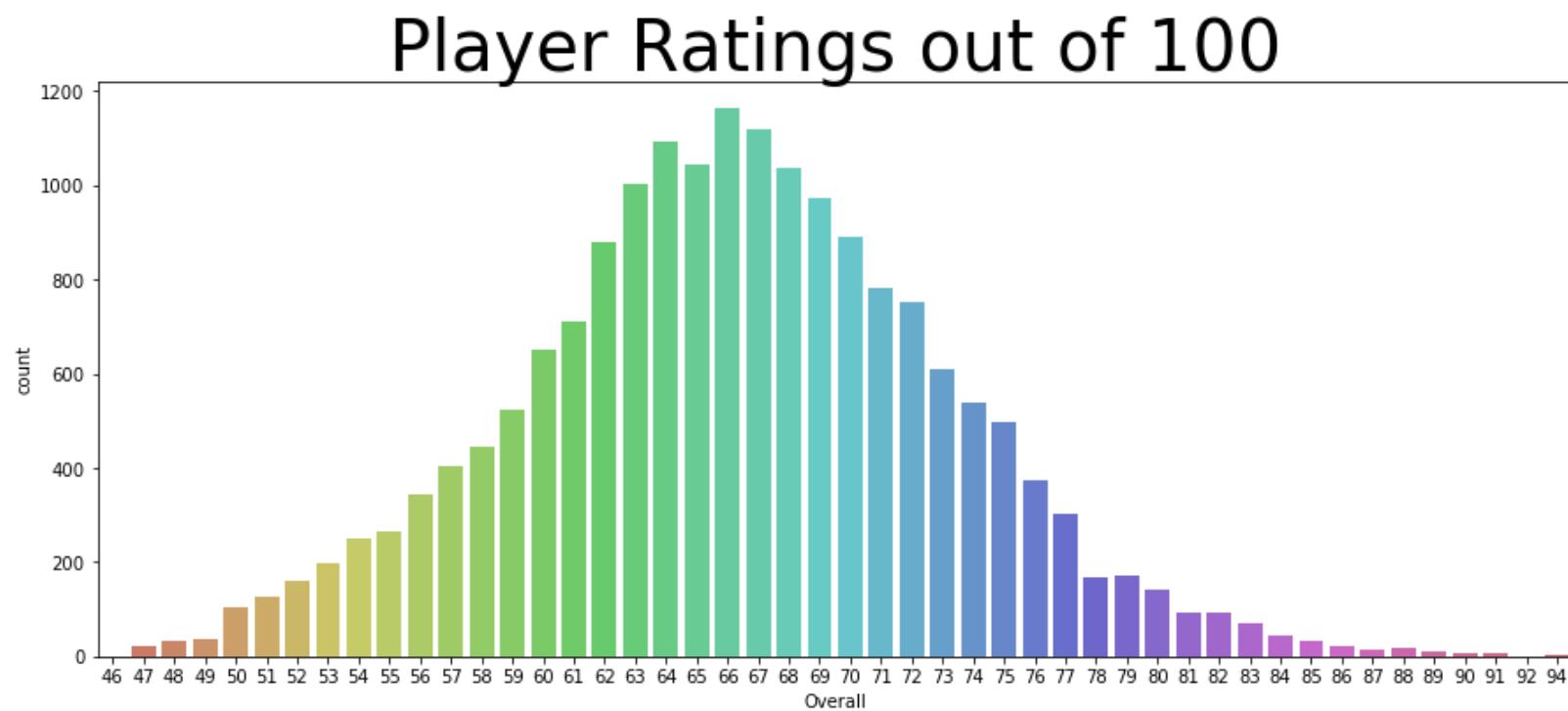
```
In [36]: player_features = ["Crossing", "Potential", "Finishing", "HeadingAccuracy", "ShortPassing", "Volleys",
                           "Dribbling", "Curve", "FKAccuracy", "LongPassing", "BallControl", "Acceleration",
                           "SprintSpeed", "Agility", "Reactions", "Balance", "ShotPower", "Jumping", "Stamina",
                           "Strength", "LongShots", "Aggression", "Interceptions", "Positioning", "Vision",
                           "Penalties", "Composure", "Marking", "StandingTackle", "SlidingTackle", "GKDiving",
                           "GKHandling", "GKKicking", "GKPositioning", "GKReflexes"]

for i, val in df_fifa.groupby(df_fifa["Position"])[player_features].mean().iterrows():
    print("Position {}: {}, {}, {}".format(i, *tuple(val.nlargest(3).index)))
```

Position CAM: Balance, Potential, Agility  
Position CB: Strength, Potential, Jumping  
Position CDM: Potential, Stamina, Aggression  
Position CF: Agility, Balance, Acceleration  
Position CM: Potential, Balance, ShortPassing  
Position GK: Potential, GKReflexes, GKDiving  
Position LAM: Agility, Balance, SprintSpeed  
Position LB: SprintSpeed, Acceleration, Stamina  
Position LCB: Strength, Potential, Jumping  
Position LCM: Stamina, Potential, ShortPassing  
Position LDM: Stamina, Potential, ShortPassing  
Position LF: Balance, Agility, Acceleration  
Position LM: Acceleration, SprintSpeed, Agility  
Position LS: SprintSpeed, Potential, Strength  
Position LW: Acceleration, SprintSpeed, Agility  
Position LWB: SprintSpeed, Acceleration, Stamina  
Position RAM: Agility, Balance, Acceleration  
Position RB: SprintSpeed, Stamina, Acceleration  
Position RCB: Strength, Potential, Jumping  
Position RCM: Stamina, Potential, ShortPassing  
Position RDM: Stamina, Potential, ShortPassing  
Position RF: Agility, Potential, Acceleration  
Position RM: Acceleration, SprintSpeed, Agility  
Position RS: SprintSpeed, Potential, Strength  
Position RW: Acceleration, SprintSpeed, Agility  
Position RWB: SprintSpeed, Acceleration, Stamina  
Position ST: Potential, SprintSpeed, Strength

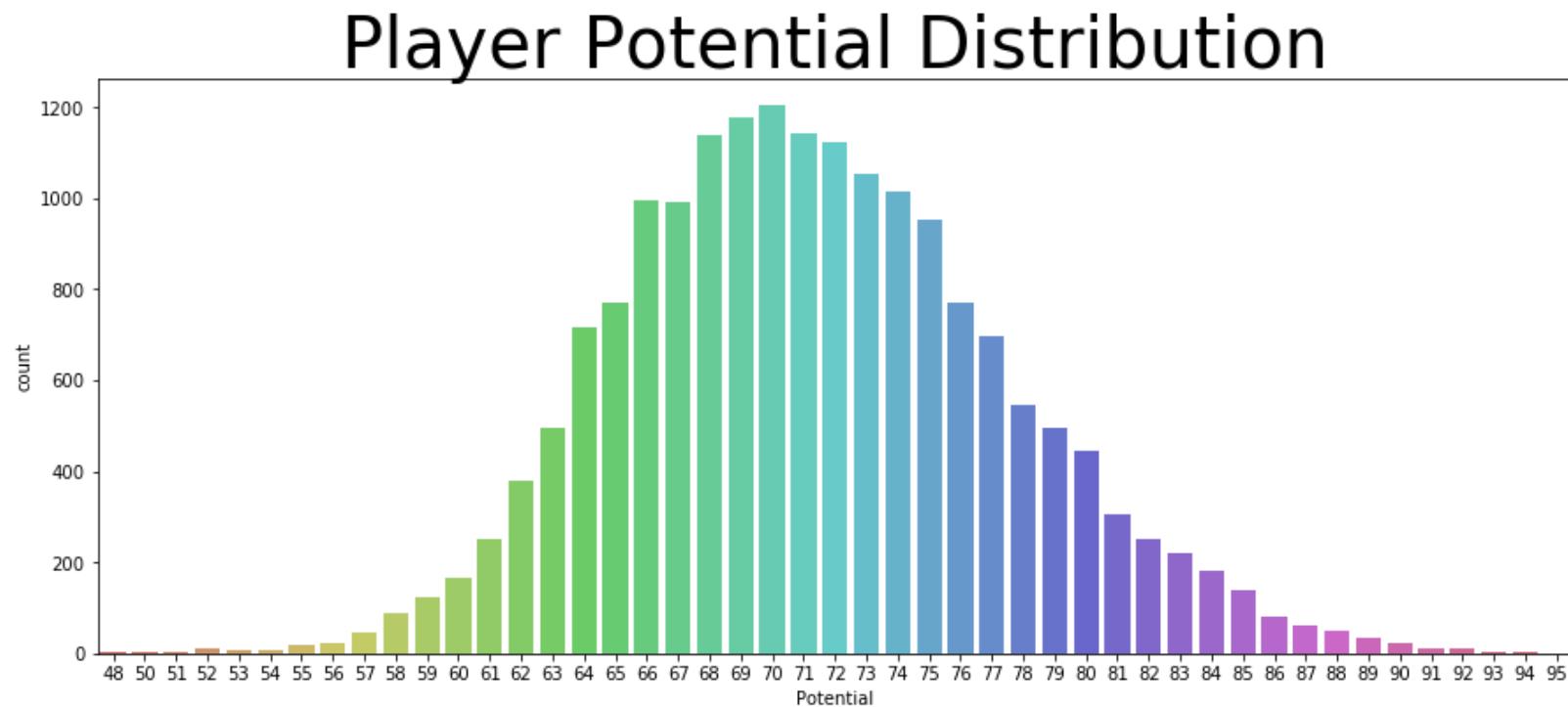
## FREQUENCY OF OVERALL PLAYER RATINGS

```
In [37]: plt.figure(1, figsize = (15, 6))
pos = sns.countplot(x = "Overall", data = df_fifa, palette = "hls");
pos.set_title(label="Player Ratings out of 100", fontsize=40);
plt.show()
```



PLAYER POTENTIAL DISTRIBUTION

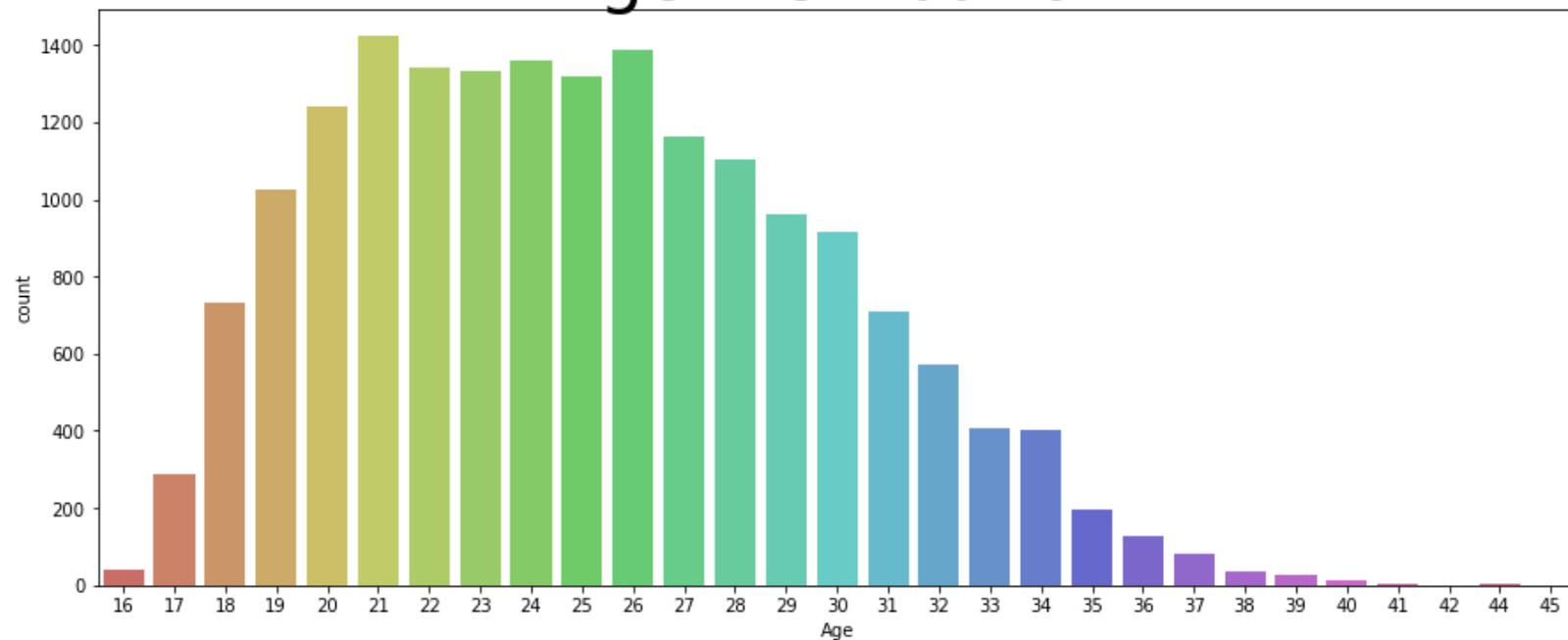
```
In [38]: plt.figure(1, figsize = (15, 6))
pos = sns.countplot(x = "Potential", data = df_fifa, palette = "hls");
pos.set_title(label="Player Potential Distribution", fontsize=40);
plt.show()
```



## PLAYERS AGE DISTRIBUTION

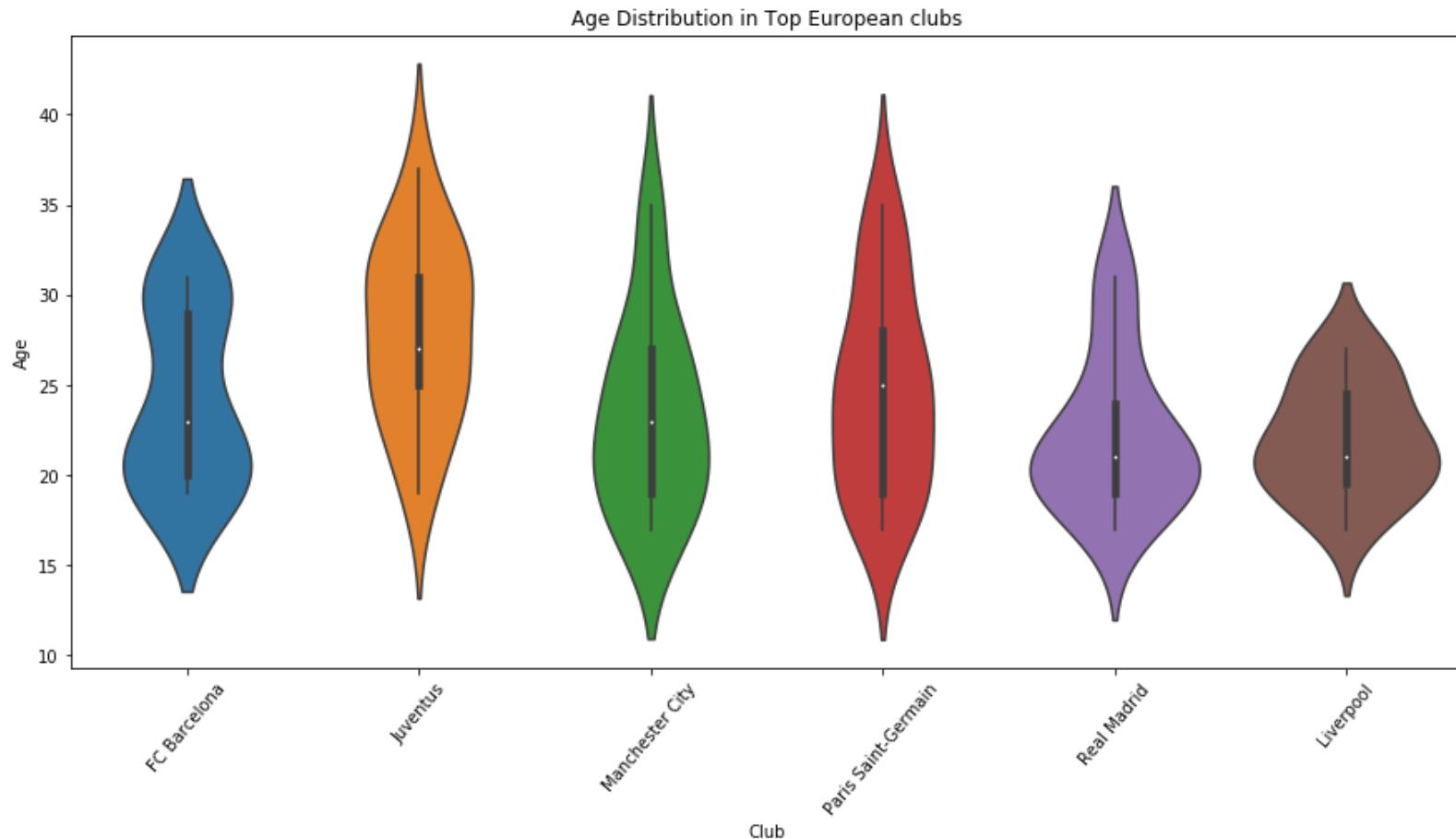
```
In [39]: plt.figure(1, figsize = (15, 6))
pos = sns.countplot(x = "Age", data = df_fifa, palette = "hls");
pos.set_title(label="Age Distribution", fontsize=40);
plt.show()
```

# Age Distribution



AGE DISTRIBUTION IN TOP CLUBS IN EUROPE

```
In [40]: clubs = ["FC Barcelona", "Real Madrid", "Juventus", "Liverpool", "Manchester City", "Paris Saint-Germain"]
df_club_age = df_fifa.loc[df_fifa["Club"].isin(clubs) & df_fifa["Age"]]
plt.figure(1 , figsize = (15 ,7))
sns.violinplot(x = "Club", y = "Age", data = df_club_age)
plt.title("Age Distribution in Top European clubs")
plt.xticks(rotation = 50)
plt.show()
```



## CLUBS WITH MOST PLAYERS

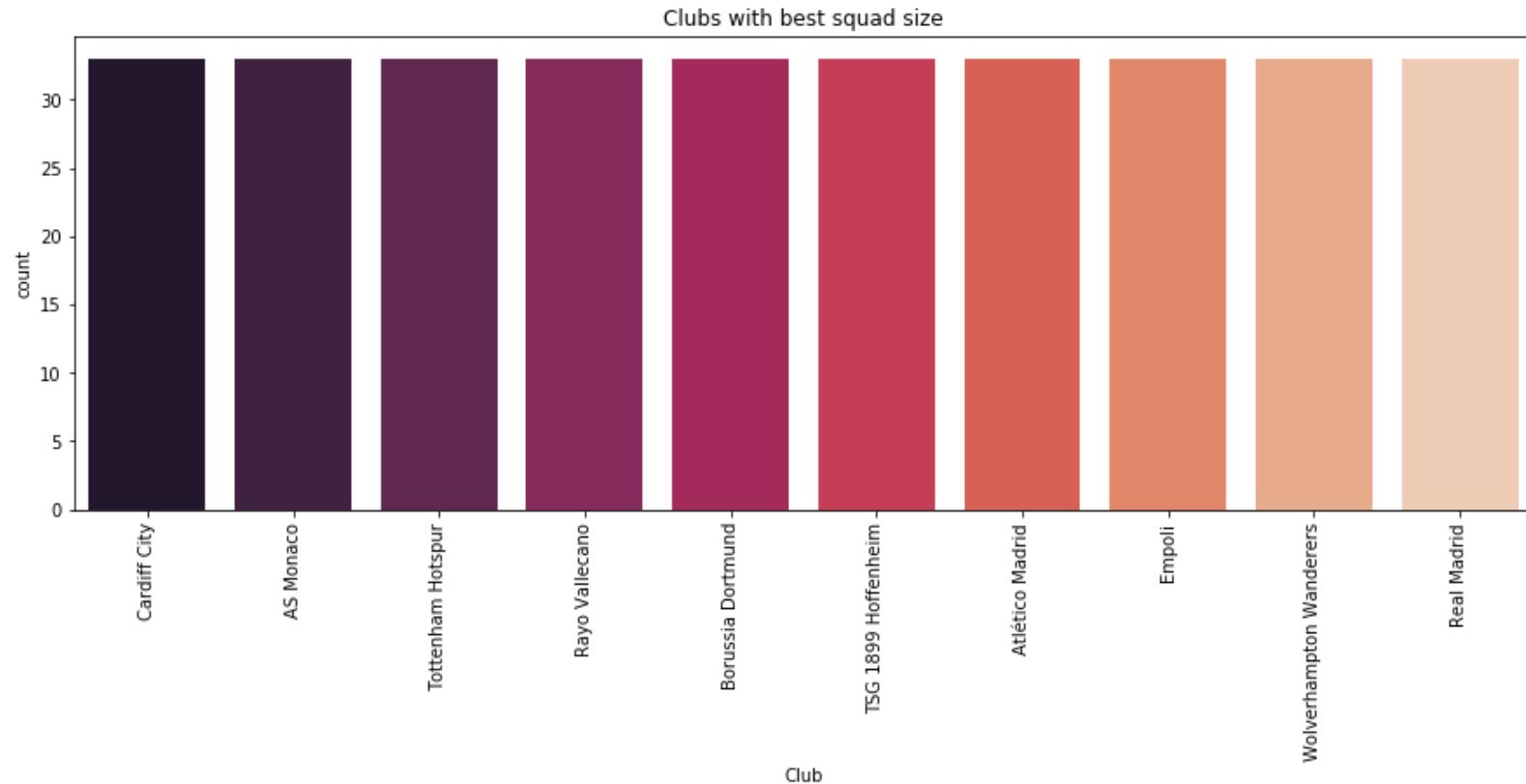
```
In [41]: print("Total number of clubs : {0}".format(df_fifa["Club"].nunique()))
print(df_fifa["Club"].value_counts().head(10))
```

```
Total number of clubs : 651
Borussia Dortmund      33
Cardiff City           33
Real Madrid            33
Valencia CF            33
Everton                 33
Atlético Madrid        33
Fortuna Düsseldorf    33
CD Leganés              33
Frosinone                33
Wolverhampton Wanderers 33
Name: Club, dtype: int64
```

BEST SQUAD SIZE

```
In [42]: plt.figure(1 , figsize = (15 , 5))
club = []
c = counter(df_fifa["Club"]).most_common()[:11]
for n in range(11):club.append(c[n][0])

sns.countplot(x = "Club" , data = df_fifa[df_fifa["Club"].isin(club)],
               order = df_fifa[df_fifa["Club"].isin(club)]["Club"].value_counts().index, palette = "rocket")
plt.xticks(rotation = 90)
plt.title("Clubs with best squad size" )
plt.show()
```



## CHANGING DATA FORMAT

```
In [43]: def cleaning_value(x):
    if '€' in str(x) and 'M' in str(x):
        c = str(x).replace('€' , '')
        c = str(c).replace('M' , '')
        c = float(c) * 1000000

    else:
        c = str(x).replace('€' , '')
        c = str(c).replace('K' , '')
        c = float(c) * 1000

    return c

fn = lambda x : cleaning_value(x)

df_fifa["Value_num"] = df_fifa["Value"].apply(fn)
df_fifa["Wage_num"] = df_fifa["Wage"].apply(fn)
```

## MOST VALUABLE PLAYERS

```
In [44]: df_fifa.sort_values(by = "Value_num", ascending = False)[["Name", "Club", "Nationality", "Overall", "Value"]].head()
```

Out[44]:

|    | Name         | Club                | Nationality | Overall | Value   |
|----|--------------|---------------------|-------------|---------|---------|
| 2  | Neymar Jr    | Paris Saint-Germain | Brazil      | 92      | €118.5M |
| 0  | L. Messi     | FC Barcelona        | Argentina   | 94      | €110.5M |
| 4  | K. De Bruyne | Manchester City     | Belgium     | 91      | €102M   |
| 5  | E. Hazard    | Chelsea             | Belgium     | 91      | €93M    |
| 15 | P. Dybala    | Juventus            | Argentina   | 89      | €89M    |

## BEST PAID PLAYERS

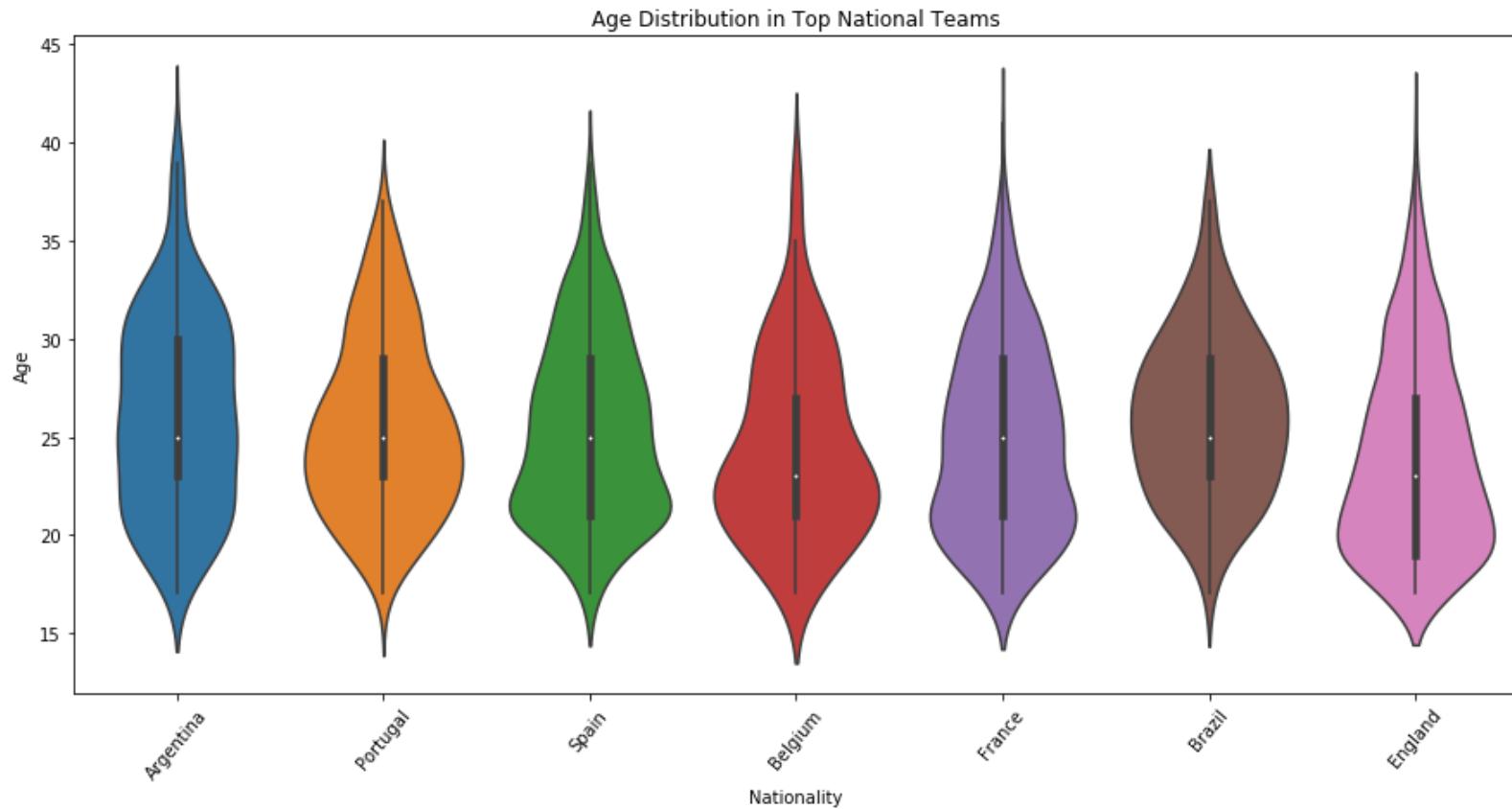
```
In [45]: df_fifa.sort_values(by = "Wage_num", ascending = False)[["Name", "Club", "Nationality", "Overall", "Wage"]].head()
```

Out[45]:

|   | Name              | Club         | Nationality | Overall | Wage  |
|---|-------------------|--------------|-------------|---------|-------|
| 0 | L. Messi          | FC Barcelona | Argentina   | 94      | €565K |
| 7 | L. Suárez         | FC Barcelona | Uruguay     | 91      | €455K |
| 6 | L. Modrić         | Real Madrid  | Croatia     | 91      | €420K |
| 1 | Cristiano Ronaldo | Juventus     | Portugal    | 94      | €405K |
| 8 | Sergio Ramos      | Real Madrid  | Spain       | 91      | €380K |

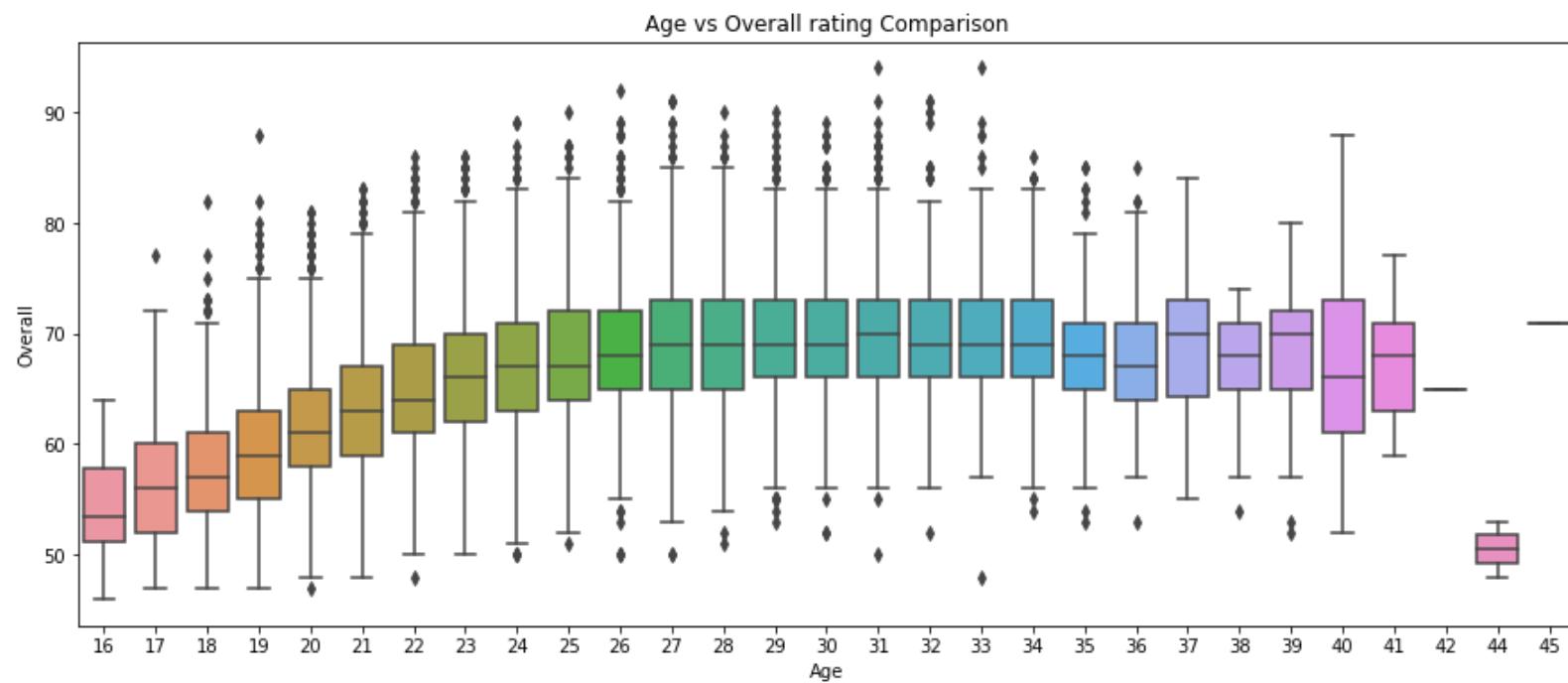
## AGE DISTRIBUTION IN TOP COUNTRIES

```
In [46]: country = ["Argentina", "Brazil", "France", "Belgium", "England", "Spain", "Portugal"]
df_country_age = df_fifa.loc[df_fifa["Nationality"].isin(country) & df_fifa["Age"]]
plt.figure(1 , figsize = (15 ,7))
sns.violinplot(x = "Nationality" , y = "Age" , data = df_country_age)
plt.title("Age Distribution in Top National Teams")
plt.xticks(rotation = 50)
plt.show()
```



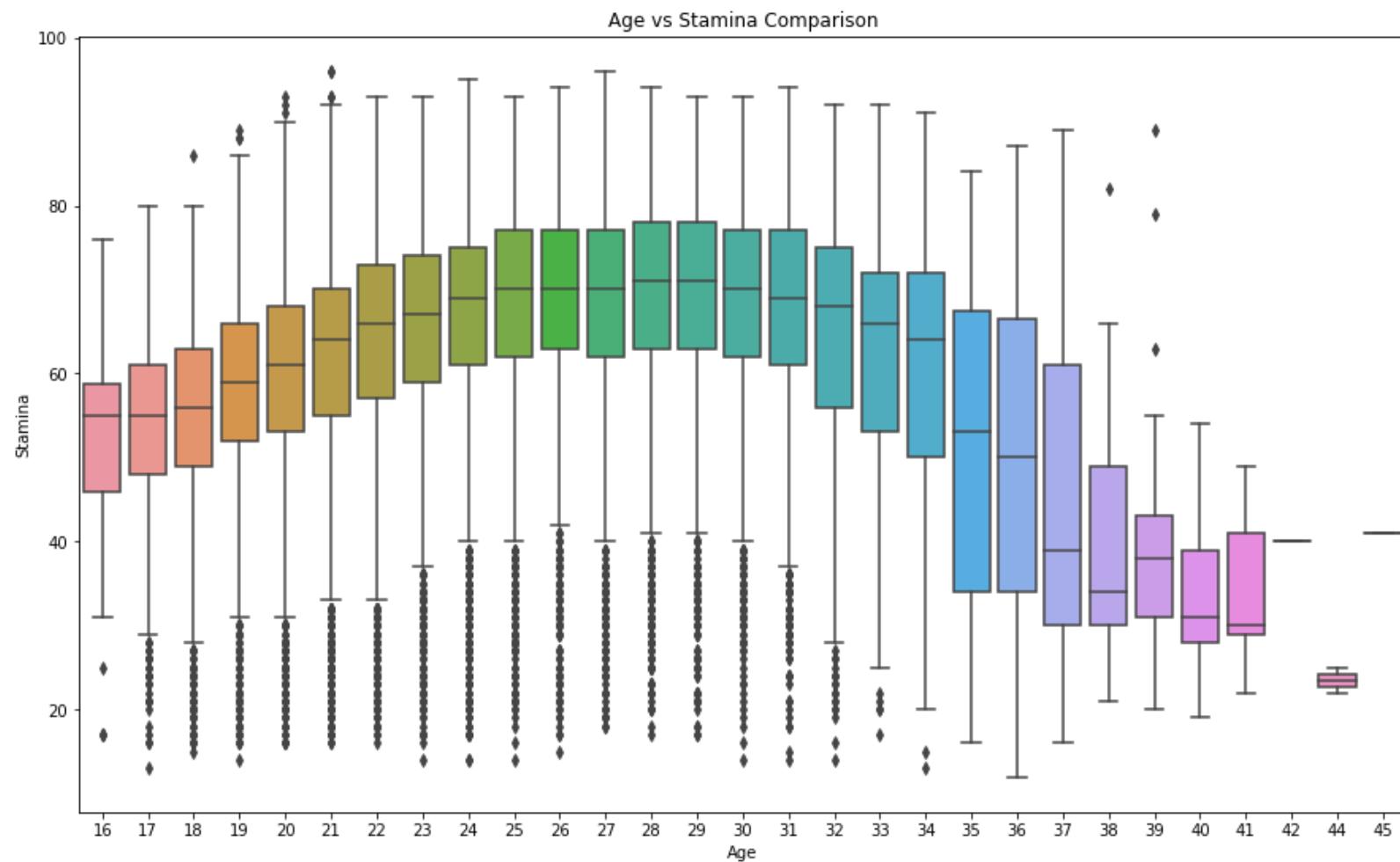
#### AGE VS OVERALL RATING COMPARISON

```
In [47]: plt.figure(1 , figsize = (15 , 6))
sns.boxplot(df_fifa["Age"] , df_fifa["Overall"])
plt.title("Age vs Overall rating Comparison")
plt.show()
```



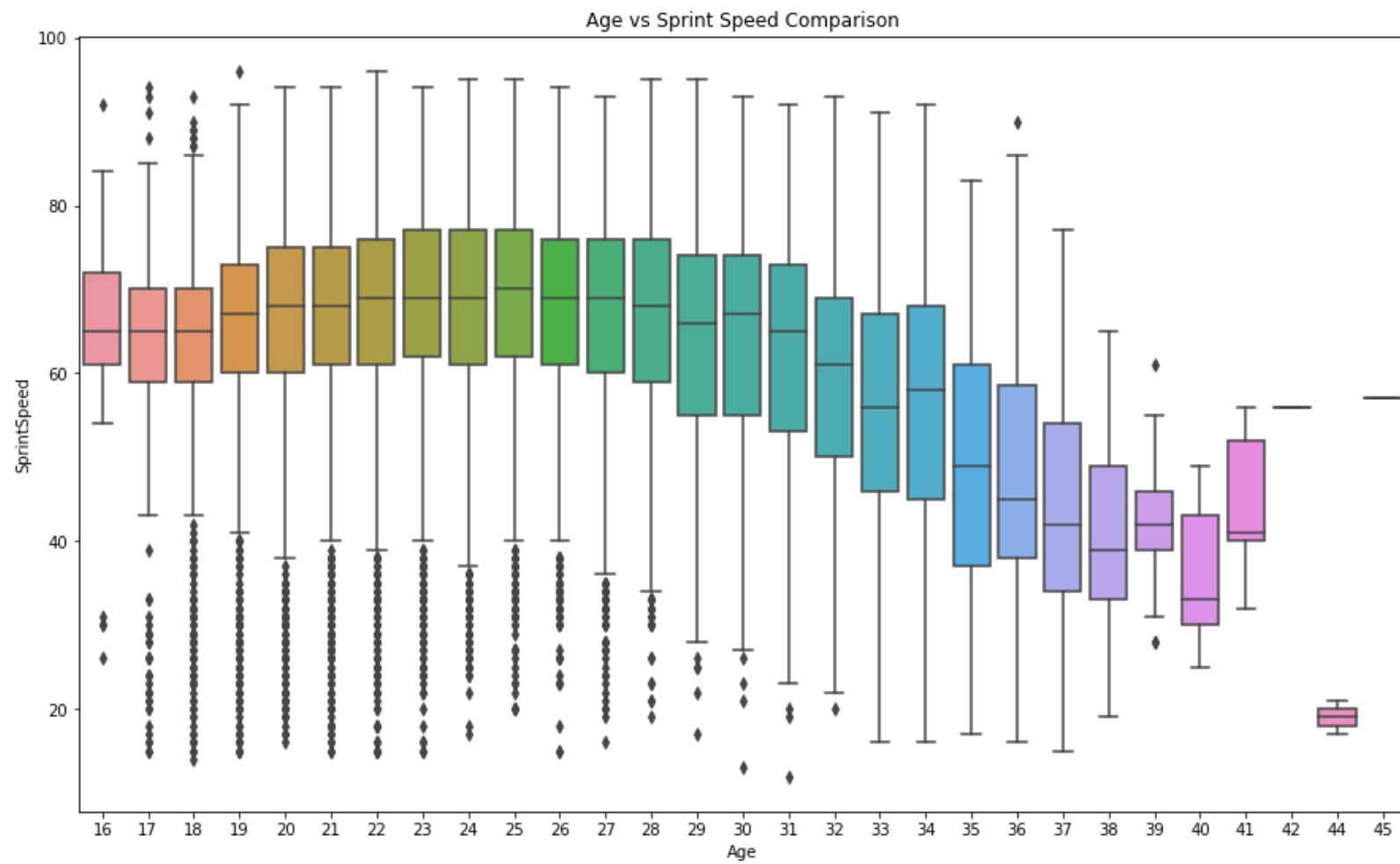
### AGE VS STAMINA COMPARISON

```
In [48]: plt.figure(1 , figsize = (15 , 9))
sns.boxplot(x = "Age", y = "Stamina", data = df_fifa)
plt.title("Age vs Stamina Comparison")
plt.show()
```



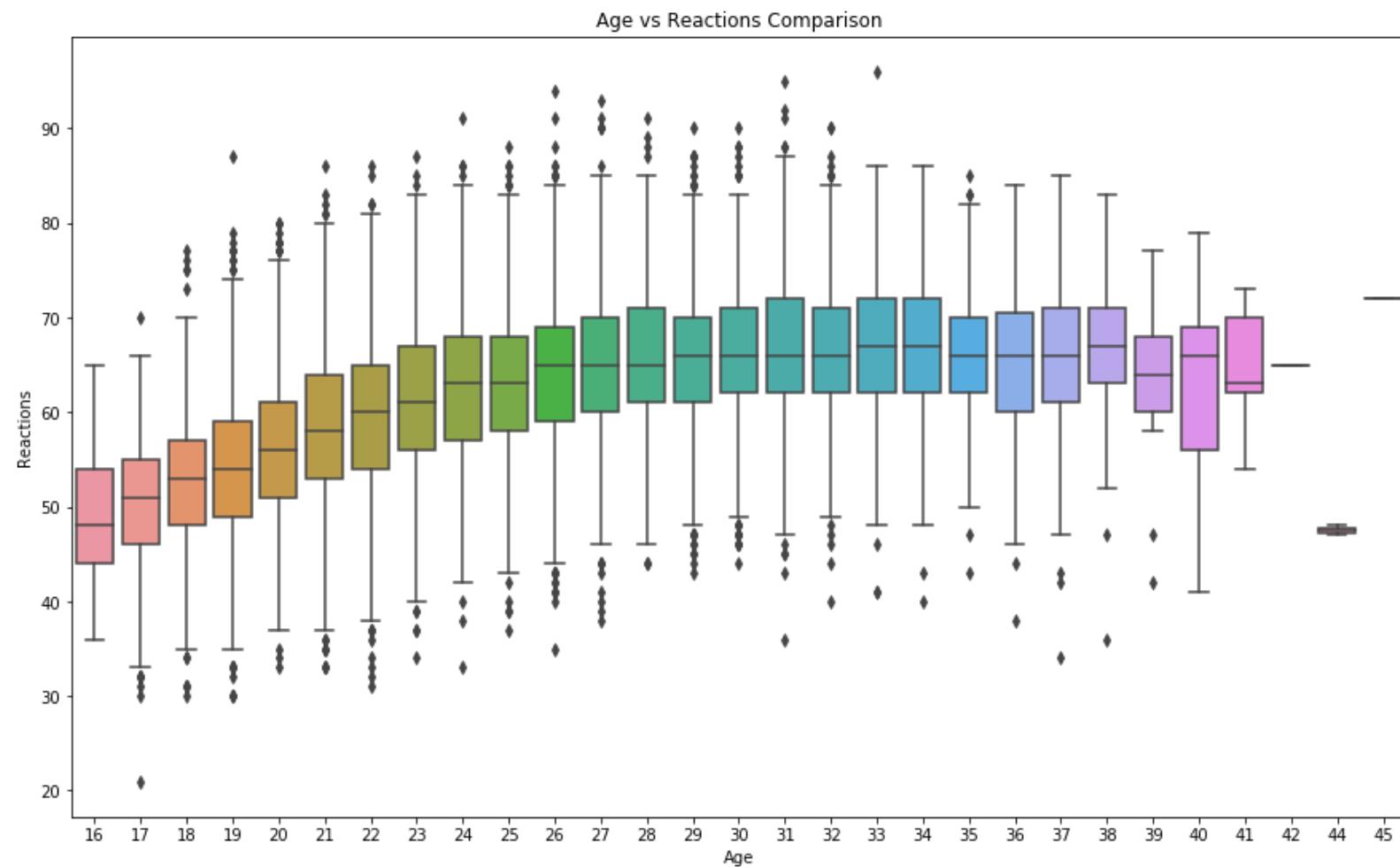
#### AGE VS SPRINT SPEED COMPARISON

```
In [49]: plt.figure(1 , figsize = (15 , 9))
sns.boxplot(x = "Age", y = "SprintSpeed", data = df_fifa)
plt.title("Age vs Sprint Speed Comparison")
plt.show()
```



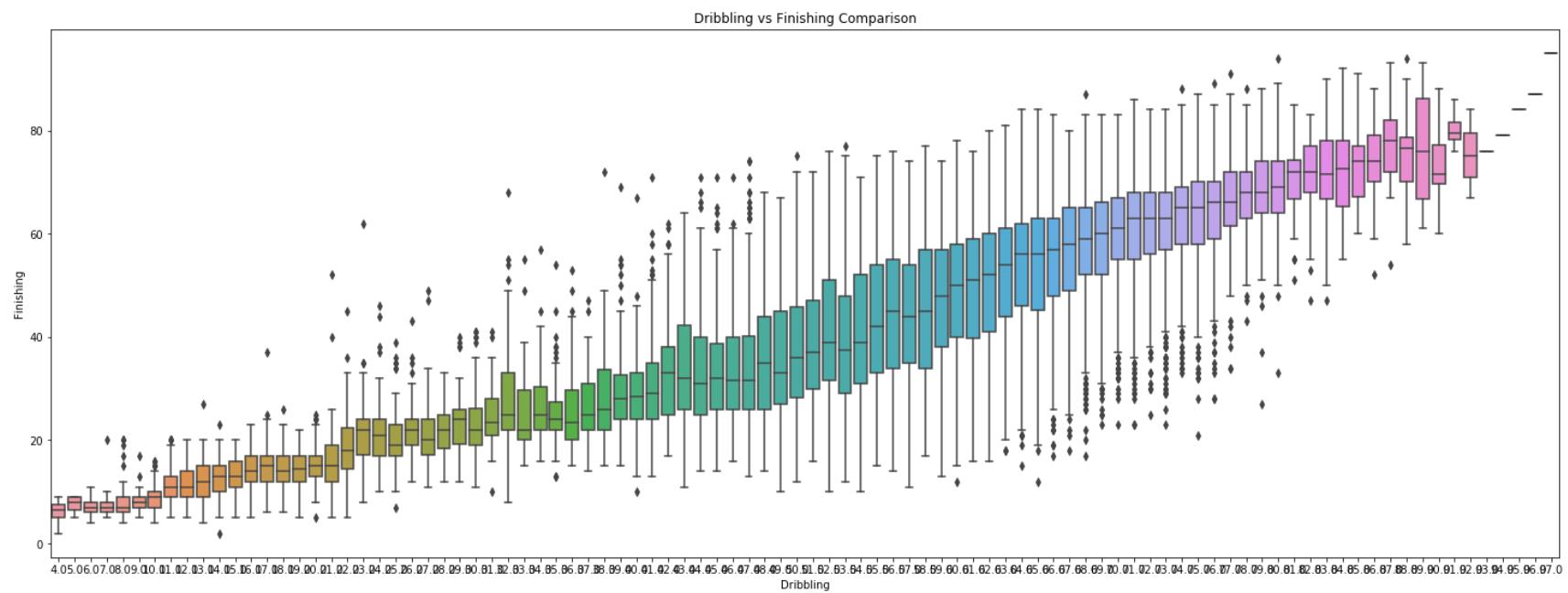
#### AGE VS REACTION COMPARISON

```
In [50]: plt.figure(1 , figsize = (15 , 9))
sns.boxplot(x = "Age", y = "Reactions", data = df_fifa)
plt.title("Age vs Reactions Comparison")
plt.show()
```



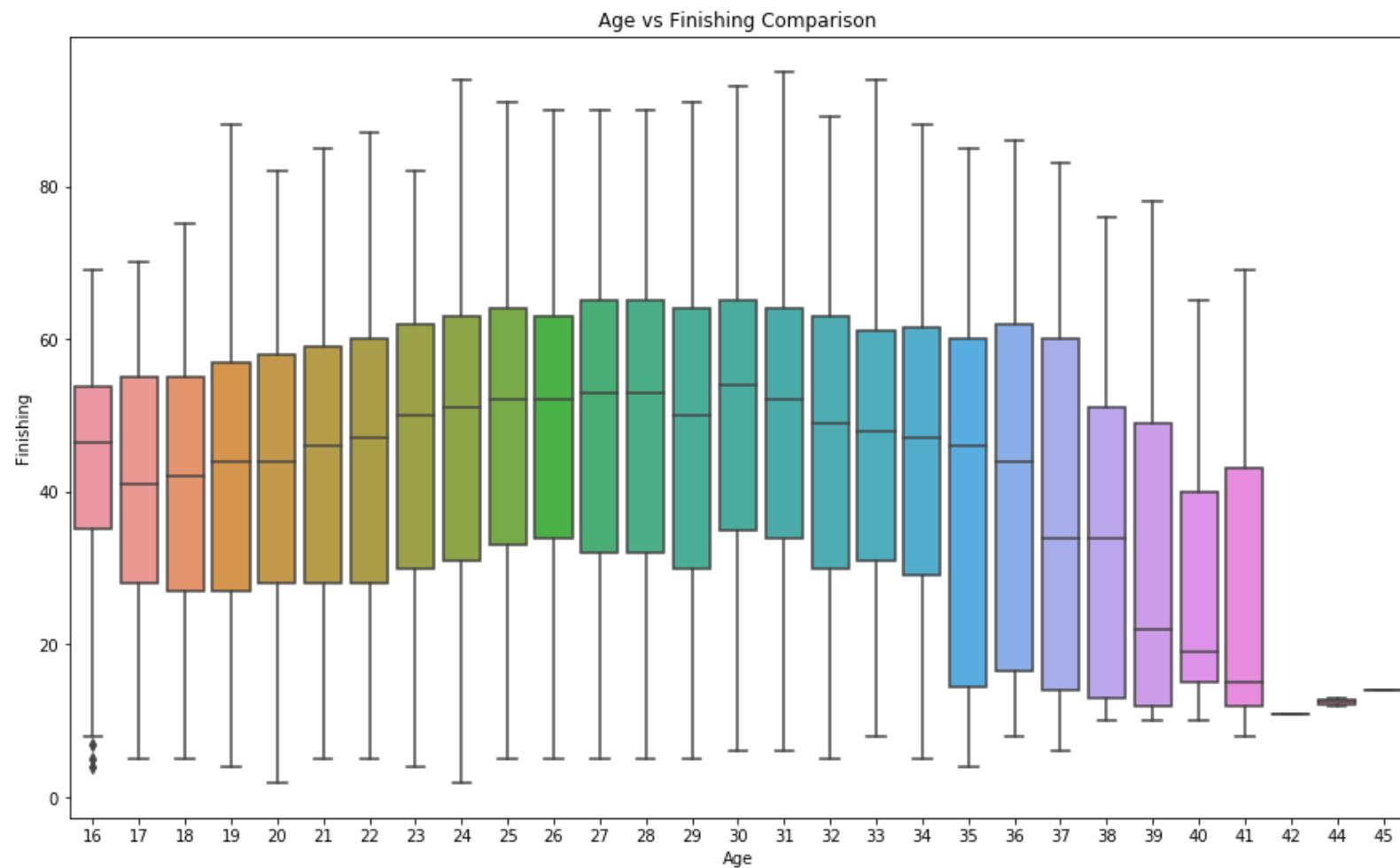
## Dribbling vs Finishing Comparison

```
In [51]: plt.figure(1 , figsize = (25 , 9))
sns.boxplot(x = "Dribbling", y = "Finishing", data = df_fifa)
plt.title("Dribbling vs Finishing Comparison")
plt.show()
```



## AGE VS FINISHING COMPARISON

```
In [52]: plt.figure(1 , figsize = (15 , 9))
sns.boxplot(x = "Age", y = "Finishing", data = df_fifa)
plt.title("Age vs Finishing Comparison")
plt.show()
```



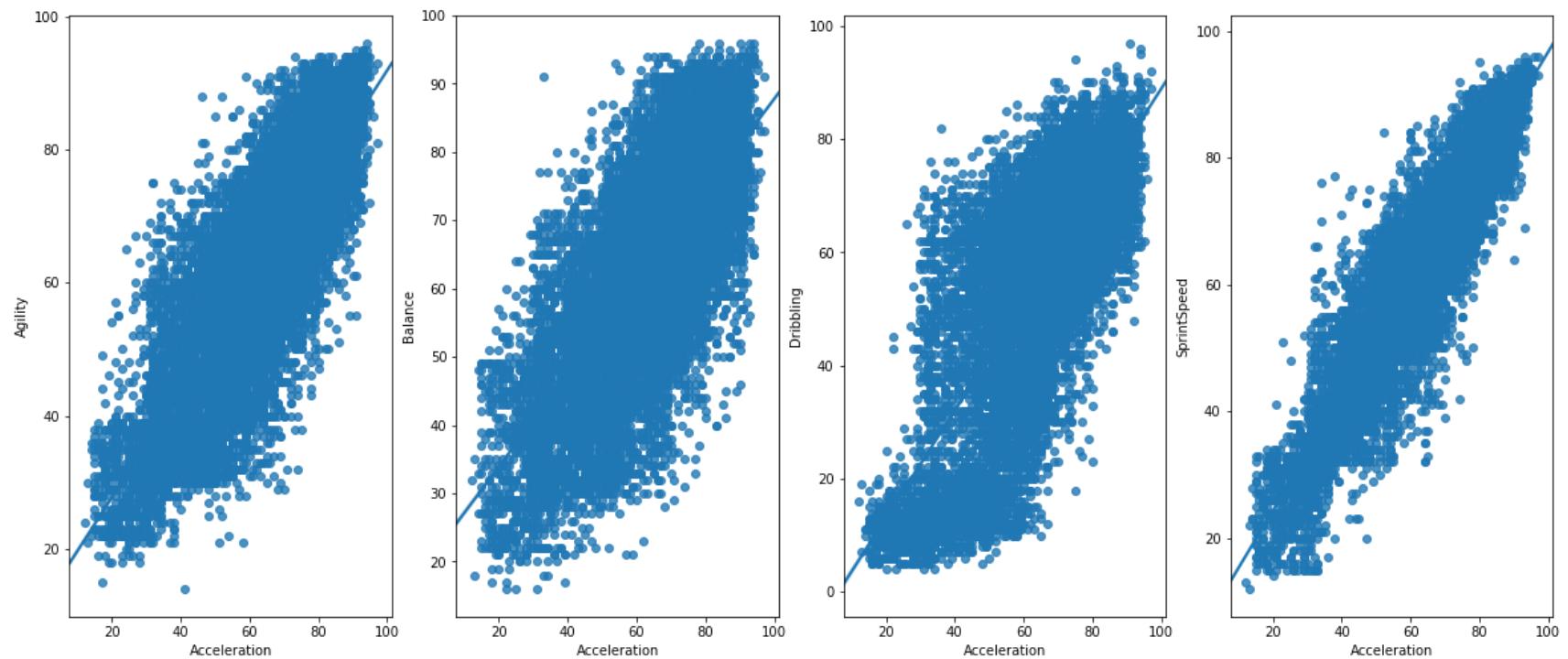
## COMPARING FEATURES WITH RESPECT TO ACCELERATION

```
In [53]: def make_scatter(df_fifa):
    feats = ("Agility", "Balance", "Dribbling", "SprintSpeed")

    for index, feat in enumerate(feats):
        plt.subplot(len(feats)/4+1, 4, index+1)
        ax = sns.regplot(x = 'Acceleration', y = feat, data = df_fifa)

plt.figure(figsize = (20, 20))
plt.subplots_adjust(hspace = 0.4)

make_scatter(df_fifa)
plt.show()
```



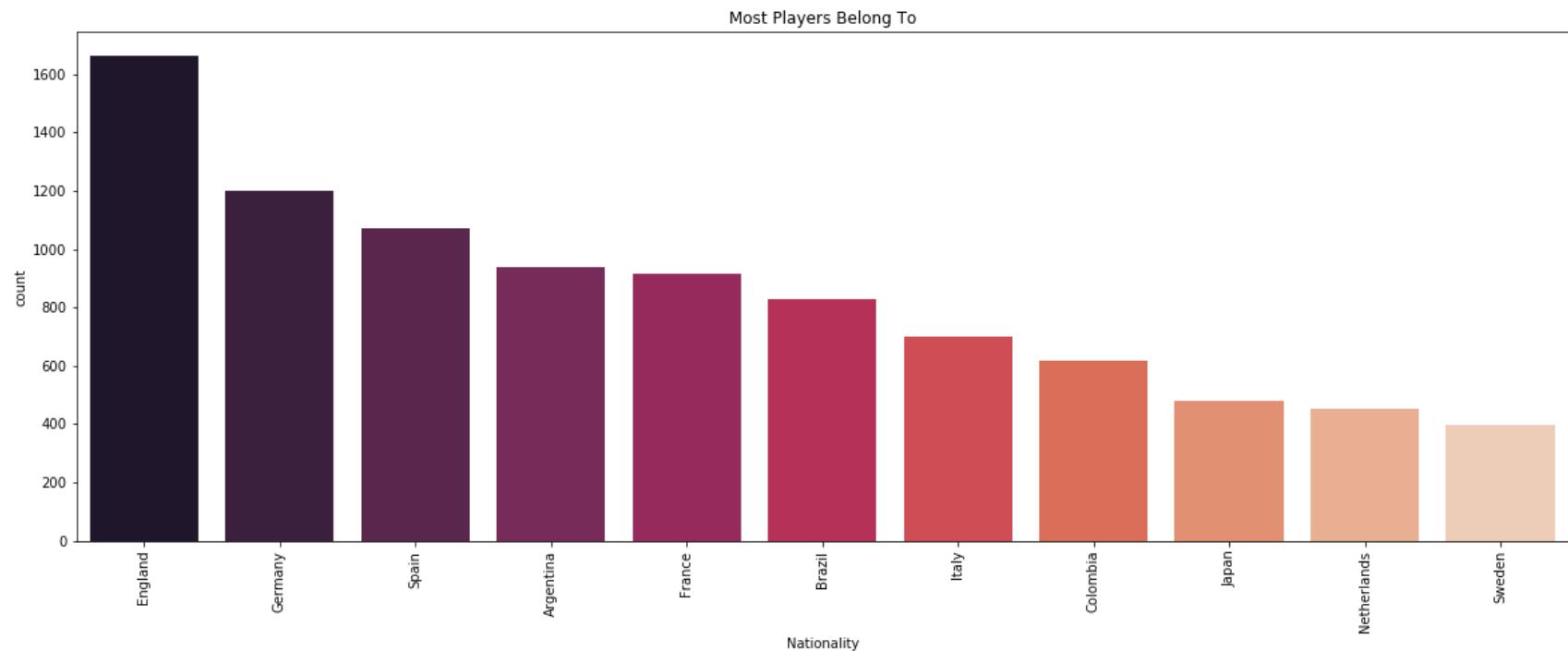
## COUNTRY WITH MOST PLAYERS

```
In [54]: print("Total number of countries : {0}".format(df_fifa["Nationality"].nunique()))
print(df_fifa["Nationality"].value_counts().head(10))
```

```
Total number of countries : 164
England      1662
Germany     1198
Spain        1072
Argentina    937
France       914
Brazil        827
Italy         702
Colombia     618
Japan         478
Netherlands   453
Name: Nationality, dtype: int64
```

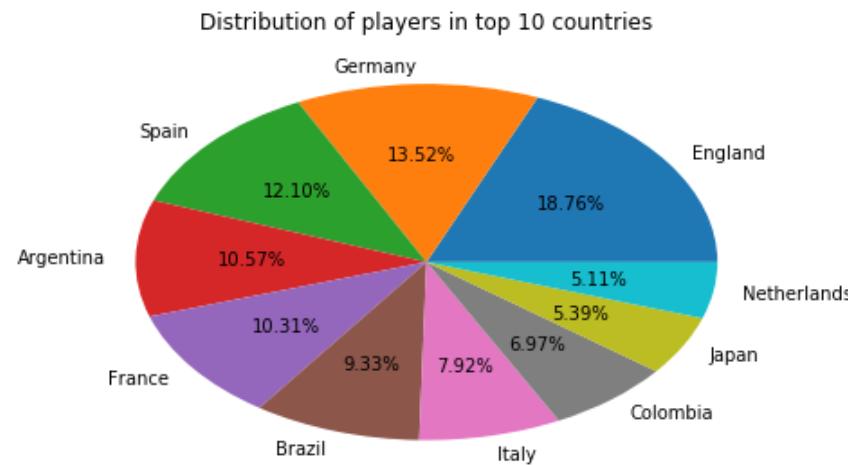
## COUNTPLOT DISTRIBUTION

```
In [55]: plt.figure(1, figsize = (20 , 7))
countries = []
c = Counter(df_fifa["Nationality"]).most_common()[:11]
for n in range(11) : countries.append(c[n][0])
sns.countplot(x = "Nationality", data = df_fifa[df_fifa["Nationality"].isin(countries)],
               order = df_fifa[df_fifa["Nationality"].isin(countries)]["Nationality"].value_counts().index,
               palette = "rocket")
plt.xticks(rotation = 90)
plt.title("Most Players Belong To" )
plt.show()
```



## PIE CHART DISTRIBUTION

```
In [56]: countries=df_fifa["Nationality"].value_counts()  
index=countries.index  
con=pd.DataFrame({"Country":index,"Count":countries})  
con=con["England":"Netherlands"]  
plt.pie(con["Count"],labels=con["Country"],wedgeprops = {"linewidth": 5},autopct='%.2f%%')  
plt.title("Distribution of players in top 10 countries")  
plt.tight_layout()  
plt.show()
```



## COMPARISON - FC BARCELONA, REAL MADRID, LIVERPOOL AND MANCHESTER CITY

### FC BARCELONA

```
In [57]: plt.figure(1, figsize = (15, 10))
img = mpimg.imread("Barcelonalogo.jpg")
plt.imshow(img)
plt.show()
```



FULL SQUAD LIST OF FC BARCELONA

```
In [58]: df_fifa[df_fifa["Club"] == "FC Barcelona"][[ "Name", "Position", "Overall", "Age", "Wage", "Nationality"]]
```

Out[58]:

|             | Name            | Position | Overall | Age | Wage  | Nationality |
|-------------|-----------------|----------|---------|-----|-------|-------------|
| <b>0</b>    | L. Messi        | RF       | 94      | 31  | €565K | Argentina   |
| <b>7</b>    | L. Suárez       | RS       | 91      | 31  | €455K | Uruguay     |
| <b>18</b>   | M. ter Stegen   | GK       | 89      | 26  | €240K | Germany     |
| <b>20</b>   | Sergio Busquets | CDM      | 89      | 29  | €315K | Spain       |
| <b>32</b>   | Coutinho        | LW       | 88      | 26  | €340K | Brazil      |
| <b>42</b>   | S. Umtiti       | CB       | 87      | 24  | €205K | France      |
| <b>49</b>   | Jordi Alba      | LB       | 87      | 29  | €250K | Spain       |
| <b>53</b>   | I. Rakitić      | RCM      | 87      | 30  | €260K | Croatia     |
| <b>54</b>   | Piqué           | RCB      | 87      | 31  | €240K | Spain       |
| <b>96</b>   | A. Vidal        | CAM      | 85      | 31  | €205K | Chile       |
| <b>155</b>  | O. Dembélé      | RW       | 83      | 21  | €155K | France      |
| <b>192</b>  | Sergi Roberto   | RB       | 83      | 26  | €170K | Spain       |
| <b>228</b>  | Arthur          | LCM      | 82      | 21  | €125K | Brazil      |
| <b>236</b>  | Malcom          | RW       | 82      | 21  | €140K | Brazil      |
| <b>239</b>  | C. Lenglet      | LCB      | 82      | 23  | €135K | France      |
| <b>263</b>  | Rafinha         | CAM      | 82      | 25  | €165K | Brazil      |
| <b>266</b>  | J. Cillessen    | GK       | 82      | 29  | €135K | Netherlands |
| <b>324</b>  | Nélson Semedo   | RB       | 81      | 24  | €125K | Portugal    |
| <b>613</b>  | Denis Suárez    | CM       | 79      | 24  | €120K | Spain       |
| <b>1007</b> | Munir           | ST       | 77      | 22  | €115K | Spain       |
| <b>1037</b> | T. Vermaelen    | CB       | 77      | 32  | €110K | Belgium     |
| <b>3118</b> | Sergi Samper    | CDM      | 73      | 23  | €69K  | Spain       |
| <b>3684</b> | Aleñá           | CM       | 72      | 20  | €58K  | Spain       |
| <b>6000</b> | M. Wagué        | RB       | 69      | 19  | €20K  | Senegal     |
| <b>6102</b> | Riqui Puig      | CM       | 69      | 18  | €24K  | Spain       |
| <b>8284</b> | Oriol Busquets  | CDM      | 67      | 19  | €14K  | Spain       |

|              | Name          | Position | Overall | Age | Wage | Nationality |
|--------------|---------------|----------|---------|-----|------|-------------|
| <b>8289</b>  | Abel Ruiz     | ST       | 67      | 18  | €21K | Spain       |
| <b>8857</b>  | Miranda       | LB       | 66      | 18  | €12K | Spain       |
| <b>10526</b> | Chumi         | CB       | 65      | 19  | €11K | Spain       |
| <b>10777</b> | Jorge Cuenca  | CB       | 65      | 18  | €11K | Spain       |
| <b>11300</b> | Guillem Jaime | RW       | 64      | 19  | €13K | Spain       |
| <b>12502</b> | Ezkieta       | GK       | 63      | 21  | €10K | Spain       |
| <b>14286</b> | Iñaki Peña    | GK       | 61      | 19  | €4K  | Spain       |

## THE BEST PLAYER OF FC BARCELONA

LIONEL MESSI HAS BEEN RANKED AT THE TOP OF FIFA19 RATINGS

HE IS ALSO THE BEST PLAYER OF FC BARCELONA

```
In [59]: plt.figure(1, figsize = (15, 10))
img = mpimg.imread("Messi.jpg")
plt.imshow(img)
plt.show()
```



## REAL MADRID

```
In [60]: plt.figure(1, figsize = (15, 20))
img = mpimg.imread("rmlogo.png")
plt.imshow(img)
plt.show()
```





## FULL SQUAD LIST OF REAL MADRID

```
In [61]: df_fifa[df_fifa["Club"] == "Real Madrid"][[ "Name", "Position", "Overall", "Age", "Wage", "Nationality"]]
```

Out[61]:

|             | Name            | Position | Overall | Age | Wage  | Nationality        |
|-------------|-----------------|----------|---------|-----|-------|--------------------|
| <b>6</b>    | L. Modrić       | RCM      | 91      | 32  | €420K | Croatia            |
| <b>8</b>    | Sergio Ramos    | RCB      | 91      | 32  | €380K | Spain              |
| <b>11</b>   | T. Kroos        | LCM      | 90      | 28  | €355K | Germany            |
| <b>19</b>   | T. Courtois     | GK       | 89      | 26  | €240K | Belgium            |
| <b>27</b>   | Casemiro        | CDM      | 88      | 26  | €285K | Brazil             |
| <b>30</b>   | Isco            | LW       | 88      | 26  | €315K | Spain              |
| <b>35</b>   | Marcelo         | LB       | 88      | 30  | €285K | Brazil             |
| <b>36</b>   | G. Bale         | ST       | 88      | 28  | €355K | Wales              |
| <b>46</b>   | K. Navas        | GK       | 87      | 31  | €195K | Costa Rica         |
| <b>62</b>   | R. Varane       | RCB      | 86      | 25  | €210K | France             |
| <b>79</b>   | Marco Asensio   | RW       | 85      | 22  | €215K | Spain              |
| <b>105</b>  | K. Benzema      | ST       | 85      | 30  | €240K | France             |
| <b>123</b>  | Carvajal        | RB       | 84      | 26  | €185K | Spain              |
| <b>172</b>  | Lucas Vázquez   | RW       | 83      | 27  | €205K | Spain              |
| <b>188</b>  | Nacho Fernández | CB       | 83      | 28  | €180K | Spain              |
| <b>328</b>  | Dani Ceballos   | LCM      | 81      | 21  | €120K | Spain              |
| <b>417</b>  | Odriozola       | RB       | 80      | 22  | €115K | Spain              |
| <b>430</b>  | Mariano         | ST       | 80      | 24  | €140K | Dominican Republic |
| <b>573</b>  | Marcos Llorente | CDM      | 79      | 23  | €110K | Spain              |
| <b>697</b>  | Kiko Casilla    | GK       | 79      | 31  | €105K | Spain              |
| <b>754</b>  | Vallejo         | CB       | 78      | 21  | €81K  | Spain              |
| <b>1143</b> | Vinícius Júnior | LW       | 77      | 17  | €66K  | Brazil             |
| <b>2513</b> | F. Valverde     | CM       | 74      | 19  | €46K  | Uruguay            |
| <b>6724</b> | Reguilón        | LB       | 68      | 21  | €28K  | Spain              |
| <b>8732</b> | Javi Sánchez    | CB       | 67      | 21  | €24K  | Spain              |
| <b>9141</b> | Cristo González | ST       | 66      | 20  | €26K  | Spain              |

|       | Name            | Position | Overall | Age | Wage | Nationality |
|-------|-----------------|----------|---------|-----|------|-------------|
| 10178 | F. Feuillassier | LW       | 65      | 20  | €23K | Argentina   |
| 10269 | Fidalgo         | CM       | 65      | 21  | €20K | Spain       |
| 11163 | Sergio López    | RB       | 64      | 19  | €9K  | Spain       |
| 11327 | Fran García     | LB       | 64      | 18  | €9K  | Spain       |
| 11877 | Manu Hernando   | CB       | 64      | 19  | €9K  | Spain       |
| 12504 | Dani Gómez      | ST       | 63      | 19  | €12K | Spain       |
| 13687 | L. Zidane       | GK       | 62      | 20  | €9K  | France      |

## BEST PLAYER OF REAL MADRID

LUKA MODRIC IS THE HIGHEST RATED REAL MADRID PLAYER IN FIFA19

```
In [62]: plt.figure(1, figsize = (15, 20))
img = mpimg.imread("modric.jpg")
plt.imshow(img)
plt.show()
```



## LIVERPOOL FOOTBALL CLUB

```
In [63]: plt.figure(1, figsize = (15, 20))
img = mpimg.imread("liverpoollogo.jpg")
plt.imshow(img)
plt.show()
```



## FULL SQUAD LIST OF LIVERPOOL

```
In [64]: df_fifa[df_fifa["Club"] == "Liverpool"][[ "Name", "Position", "Overall", "Age", "Wage", "Nationality"]]
```

Out[64]:

|             | Name                  | Position | Overall | Age | Wage  | Nationality |
|-------------|-----------------------|----------|---------|-----|-------|-------------|
| <b>26</b>   | M. Salah              | RM       | 88      | 26  | €255K | Egypt       |
| <b>58</b>   | S. Mané               | LM       | 86      | 26  | €195K | Senegal     |
| <b>59</b>   | V. van Dijk           | LCB      | 86      | 26  | €165K | Netherlands |
| <b>61</b>   | Roberto Firmino       | CAM      | 86      | 26  | €195K | Brazil      |
| <b>81</b>   | Alisson               | GK       | 85      | 25  | €115K | Brazil      |
| <b>118</b>  | Fabinho               | CDM      | 84      | 24  | €120K | Brazil      |
| <b>161</b>  | N. Keïta              | CM       | 83      | 23  | €120K | Guinea      |
| <b>241</b>  | A. Robertson          | LB       | 82      | 24  | €98K  | Scotland    |
| <b>296</b>  | J. Henderson          | RCM      | 82      | 28  | €125K | England     |
| <b>302</b>  | G. Wijnaldum          | CAM      | 82      | 27  | €130K | Netherlands |
| <b>368</b>  | D. Lovren             | RCB      | 81      | 28  | €115K | Croatia     |
| <b>370</b>  | X. Shaqiri            | CAM      | 81      | 26  | €130K | Switzerland |
| <b>409</b>  | J. Milner             | CM       | 81      | 32  | €120K | England     |
| <b>481</b>  | A. Oxlade-Chamberlain | CM       | 80      | 24  | €94K  | England     |
| <b>483</b>  | J. Matip              | CB       | 80      | 26  | €99K  | Cameroon    |
| <b>515</b>  | A. Lallana            | CM       | 80      | 30  | €110K | England     |
| <b>529</b>  | D. Sturridge          | ST       | 80      | 28  | €125K | England     |
| <b>665</b>  | N. Clyne              | RB       | 79      | 27  | €94K  | England     |
| <b>703</b>  | S. Mignolet           | GK       | 79      | 30  | €76K  | Belgium     |
| <b>735</b>  | T. Alexander-Arnold   | RB       | 78      | 19  | €36K  | England     |
| <b>755</b>  | J. Gomez              | CB       | 78      | 21  | €61K  | England     |
| <b>1063</b> | D. Origic             | ST       | 77      | 23  | €83K  | Belgium     |
| <b>1194</b> | Alberto Moreno        | LB       | 77      | 25  | €76K  | Spain       |
| <b>2405</b> | L. Marković           | RM       | 74      | 24  | €62K  | Serbia      |
| <b>4763</b> | D. Solanke            | ST       | 70      | 20  | €37K  | England     |
| <b>8853</b> | Pedro Chirivella      | CM       | 66      | 21  | €17K  | Spain       |

|       | Name           | Position | Overall | Age | Wage | Nationality |
|-------|----------------|----------|---------|-----|------|-------------|
| 13503 | R. Brewster    | ST       | 62      | 18  | €8K  | England     |
| 13961 | C. Jones       | CM       | 61      | 17  | €7K  | England     |
| 14036 | N. Phillips    | CB       | 61      | 21  | €9K  | England     |
| 14252 | Rafael Camacho | CAM      | 61      | 18  | €7K  | Portugal    |
| 14674 | B. Adekanye    | RW       | 60      | 19  | €7K  | Netherlands |
| 15378 | K. Grabara     | GK       | 59      | 19  | €3K  | Poland      |
| 15627 | M. Virtue      | CDM      | 59      | 21  | €8K  | England     |

## BEST PLAYER OF LIVERPOOL

M. SALAH IS HIGHEST RATED LIVERPOOL PLAYER IN FIFA19

```
In [65]: plt.figure(1, figsize = (15, 20))
img = mpimg.imread("salah.jpg")
plt.imshow(img)
plt.show()
```



## MANCHESTER CITY

```
In [66]: plt.figure(1, figsize = (15, 20))
img = mpimg.imread("mancitylogo.jpg")
plt.imshow(img)
plt.show()
```



## FULL SQUAD LIST OF MANCHESTER CITY

```
In [67]: df_fifa[df_fifa["Club"] == "Manchester City"][[ "Name", "Position", "Overall", "Age", "Wage", "Nationality"]]
```

Out[67]:

|             | Name           | Position | Overall | Age | Wage  | Nationality |
|-------------|----------------|----------|---------|-----|-------|-------------|
| <b>4</b>    | K. De Bruyne   | RCM      | 91      | 27  | €355K | Belgium     |
| <b>13</b>   | David Silva    | LCM      | 90      | 32  | €285K | Spain       |
| <b>23</b>   | S. Agüero      | ST       | 89      | 30  | €300K | Argentina   |
| <b>55</b>   | L. Sané        | LW       | 86      | 22  | €195K | Germany     |
| <b>56</b>   | Bernardo Silva | RW       | 86      | 23  | €180K | Portugal    |
| <b>57</b>   | Ederson        | GK       | 86      | 24  | €125K | Brazil      |
| <b>60</b>   | R. Sterling    | RW       | 86      | 23  | €195K | England     |
| <b>75</b>   | Fernandinho    | CDM      | 86      | 33  | €185K | Brazil      |
| <b>84</b>   | R. Mahrez      | RW       | 85      | 27  | €205K | Algeria     |
| <b>89</b>   | N. Otamendi    | CB       | 85      | 30  | €170K | Argentina   |
| <b>107</b>  | V. Kompany     | CB       | 85      | 32  | €170K | Belgium     |
| <b>113</b>  | A. Laporte     | LCB      | 84      | 24  | €135K | France      |
| <b>135</b>  | K. Walker      | RB       | 84      | 28  | €165K | England     |
| <b>136</b>  | I. Gündoğan    | CM       | 84      | 27  | €175K | Germany     |
| <b>156</b>  | Gabriel Jesus  | ST       | 83      | 21  | €130K | Brazil      |
| <b>182</b>  | J. Stones      | RCB      | 83      | 24  | €125K | England     |
| <b>352</b>  | B. Mendy       | LB       | 81      | 23  | €105K | France      |
| <b>514</b>  | F. Delph       | LB       | 80      | 28  | €120K | England     |
| <b>645</b>  | Danilo         | RB       | 79      | 26  | €110K | Brazil      |
| <b>871</b>  | C. Bravo       | GK       | 78      | 35  | €50K  | Chile       |
| <b>1304</b> | E. Mangala     | CB       | 76      | 27  | €84K  | France      |
| <b>2903</b> | P. Foden       | CAM      | 73      | 18  | €36K  | England     |
| <b>4652</b> | O. Zinchenko   | LB       | 71      | 21  | €38K  | Ukraine     |
| <b>6316</b> | P. Sandler     | CB       | 69      | 21  | €28K  | Netherlands |
| <b>6559</b> | Brahim Díaz    | LW       | 69      | 18  | €24K  | Spain       |
| <b>8966</b> | C. Gomes       | CDM      | 66      | 17  | €10K  | France      |

|              | Name               | Position | Overall | Age | Wage | Nationality |
|--------------|--------------------|----------|---------|-----|------|-------------|
| <b>13211</b> | Eric García        | CB       | 62      | 17  | €6K  | Spain       |
| <b>13814</b> | C. Humphreys-Grant | CB       | 62      | 19  | €6K  | England     |
| <b>14197</b> | L. Bolton          | RM       | 61      | 18  | €7K  | England     |
| <b>14511</b> | A. Muric           | GK       | 61      | 19  | €3K  | Montenegro  |
| <b>15210</b> | B. Garré           | LW       | 60      | 17  | €7K  | Argentina   |
| <b>16403</b> | T. Dele-Bashiru    | CM       | 57      | 18  | €6K  | England     |
| <b>17451</b> | D. Grimshaw        | GK       | 54      | 20  | €6K  | England     |

## BEST PLAYER OF MANCHESTER CITY

KEVIN DE BRUYNE IS THE HIGHEST RATED MANCHESTER CITY PLAYER IN FIFA19

```
In [68]: plt.figure(1, figsize = (15, 20))
img = mpimg.imread("kevin.jpg")
plt.imshow(img)
plt.show()
```



## DEFINING NEW VARIABLE NAME FOR THE CLUBS

```
In [69]: barca = df_fifa[df_fifa["Club"] == "FC Barcelona"]
madrid = df_fifa[df_fifa["Club"] == "Real Madrid"]
liverpool = df_fifa[df_fifa["Club"] == "Liverpool"]
mancity = df_fifa[df_fifa["Club"] == "Manchester City"]
```

## NUMBER OF FC BARCELONA PLAYERS AVAILABLE FOR EACH POSITION

```
In [70]: barca["Position"].value_counts()
```

```
Out[70]: CB      4
          GK      4
          CDM     3
          CM      3
          RW      3
          RB      3
          LB      2
          ST      2
          CAM     2
          RCB     1
          LCM     1
          RCM     1
          LCB     1
          RF      1
          RS      1
          LW      1
Name: Position, dtype: int64
```

#### NUMBER OF REAL MADRID PLAYERS AVAILABLE FOR EACH POSITION

```
In [71]: madrid["Position"].value_counts()
```

```
Out[71]: ST      5
          GK      4
          CB      4
          LW      3
          LB      3
          RB      3
          CM      2
          RCB     2
          RW      2
          CDM     2
          LCM     2
          RCM     1
Name: Position, dtype: int64
```

#### NUMBER OF LIVERPOOL PLAYERS AVAILABLE FOR EACH POSITION

```
In [72]: liverpool["Position"].value_counts()
```

```
Out[72]: CM      6  
         ST      4  
         CAM     4  
         CB      3  
         GK      3  
         LB      2  
         CDM     2  
         RM      2  
         RB      2  
         RCB     1  
         LCB     1  
         RCM     1  
         RW      1  
         LM      1  
Name: Position, dtype: int64
```

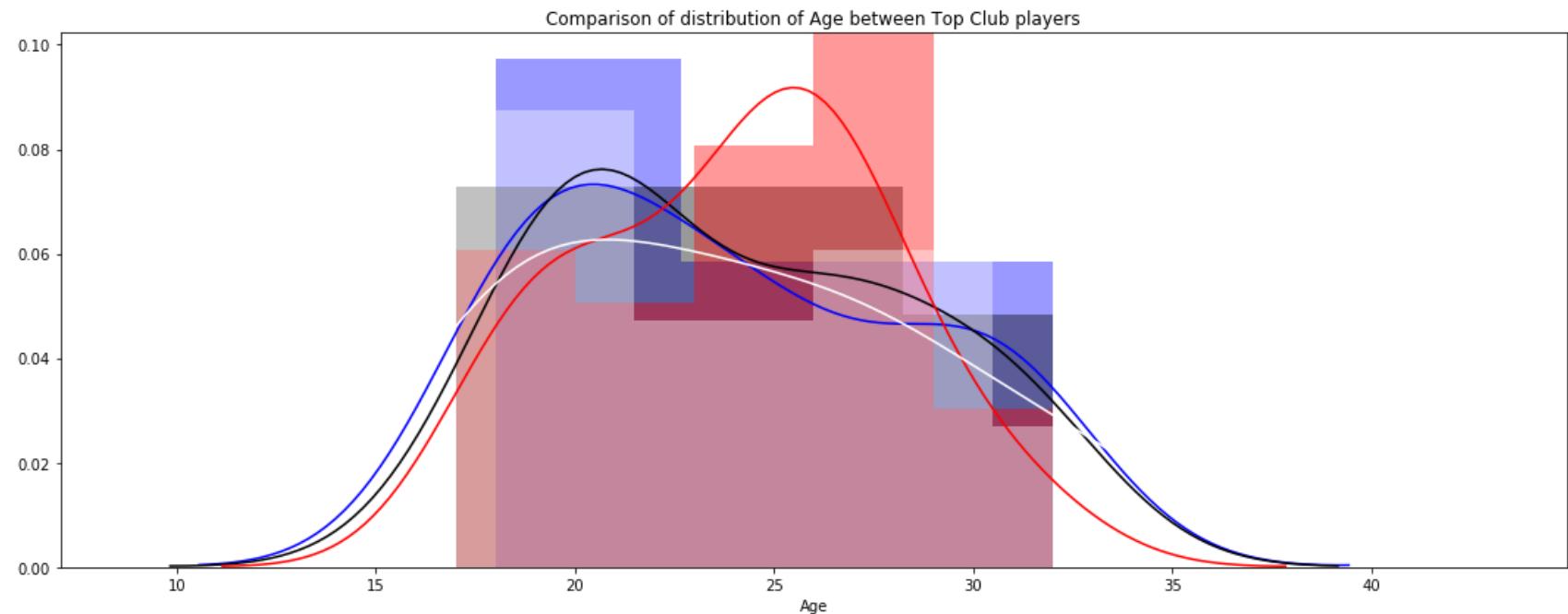
#### NUMBER OF MANCHESTER CITY PLAYERS AVAILABLE FOR EACH POSITION

```
In [73]: mancity["Position"].value_counts()
```

```
Out[73]: CB      6  
         GK      4  
         LB      3  
         RW      3  
         LW      3  
         CM      2  
         CDM     2  
         ST      2  
         RB      2  
         RM      1  
         RCB     1  
         LCB     1  
         LCM     1  
         RCM     1  
         CAM     1  
Name: Position, dtype: int64
```

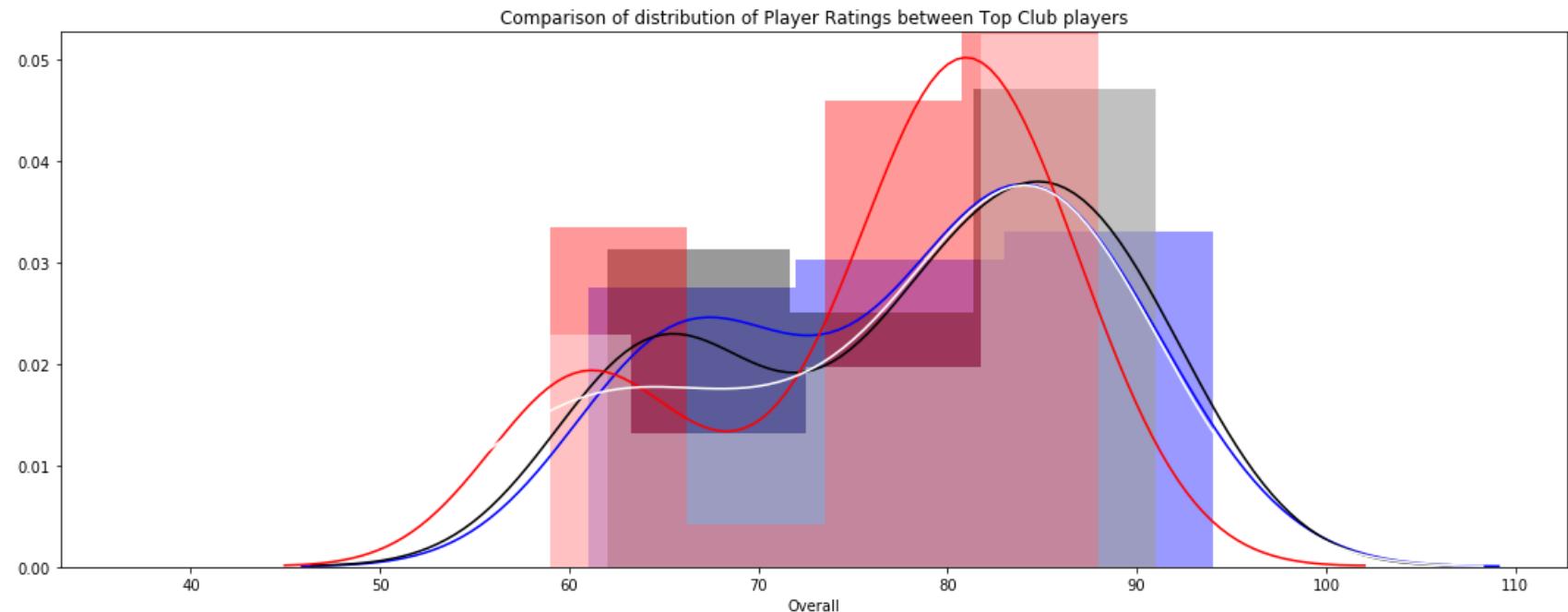
#### DISTPLOT : AGE OF PLAYERS

```
In [74]: plt.figure(1, figsize = (15, 6))
sns.distplot(barca["Age"], color = "blue")
sns.distplot(madrid["Age"], color = "black")
sns.distplot(liverpool["Age"], color = "red")
sns.distplot(mancity["Age"], color = "white")
plt.title("Comparison of distribution of Age between Top Club players")
plt.tight_layout()
plt.show()
```



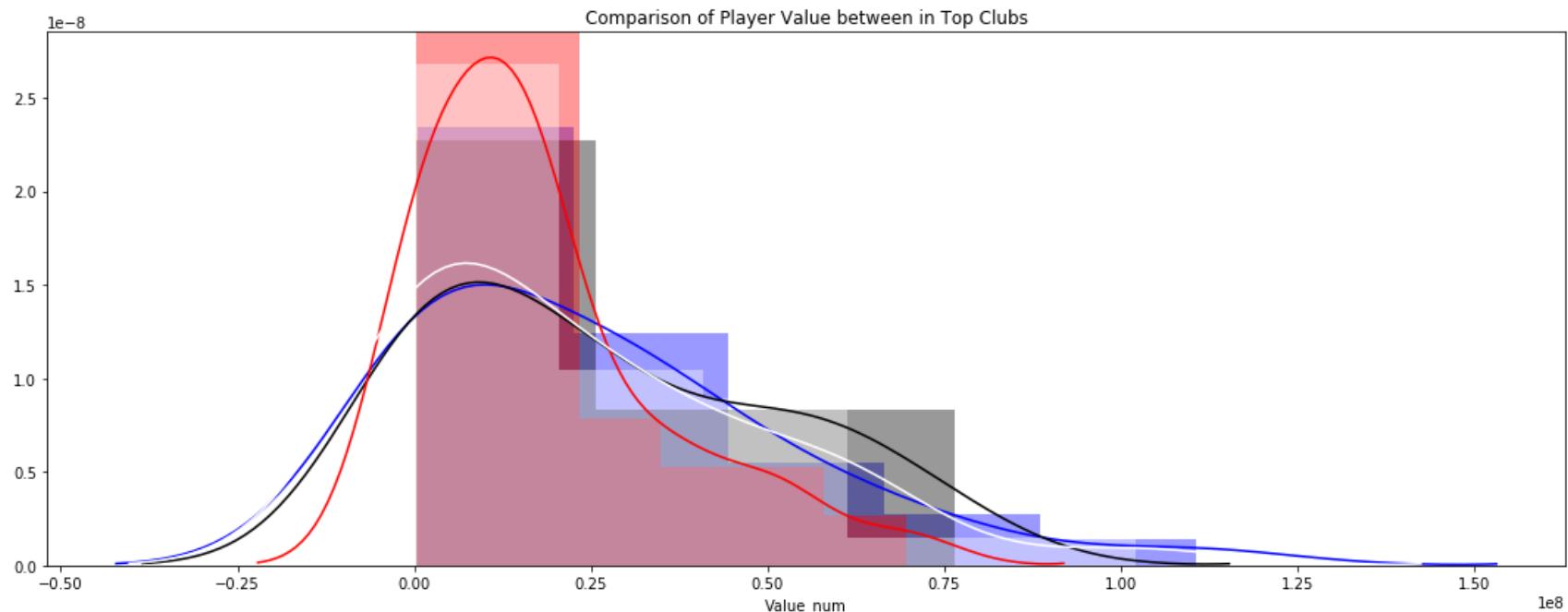
DISTPLOT : PLAYER RATING

```
In [75]: plt.figure(1, figsize = (15, 6))
sns.distplot(barca["Overall"], color = "blue")
sns.distplot(madrid["Overall"], color = "black")
sns.distplot(liverpool["Overall"], color = "red")
sns.distplot(mancity["Overall"], color = "white")
plt.title("Comparison of distribution of Player Ratings between Top Club players")
plt.tight_layout()
plt.show()
```



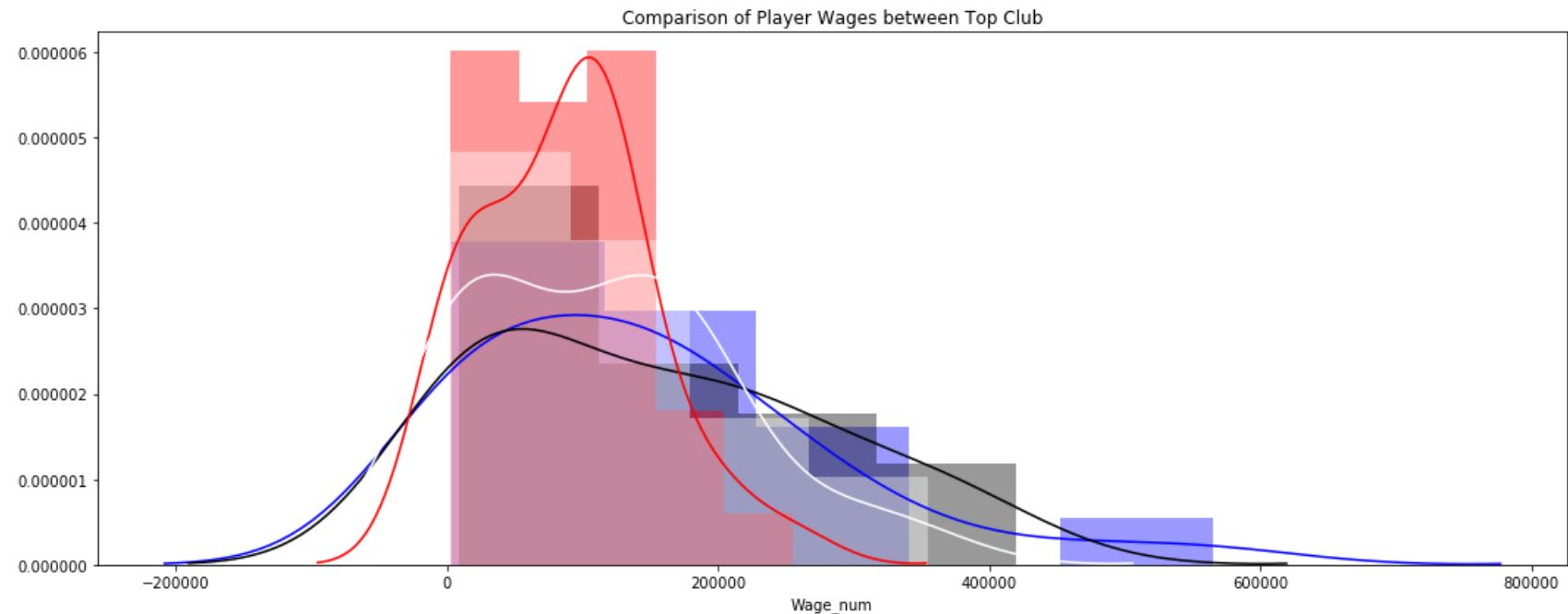
## COMPARING PLAYER VALUE DISTRIBUTION AMONG CLUBS

```
In [76]: plt.figure(1, figsize = (15, 6))
sns.distplot(barca["Value_num"], color = "blue")
sns.distplot(madrid["Value_num"], color = "black")
sns.distplot(liverpool["Value_num"], color = "red")
sns.distplot(mancity["Value_num"], color = "white")
plt.title("Comparison of Player Value between in Top Clubs")
plt.tight_layout()
plt.show()
```



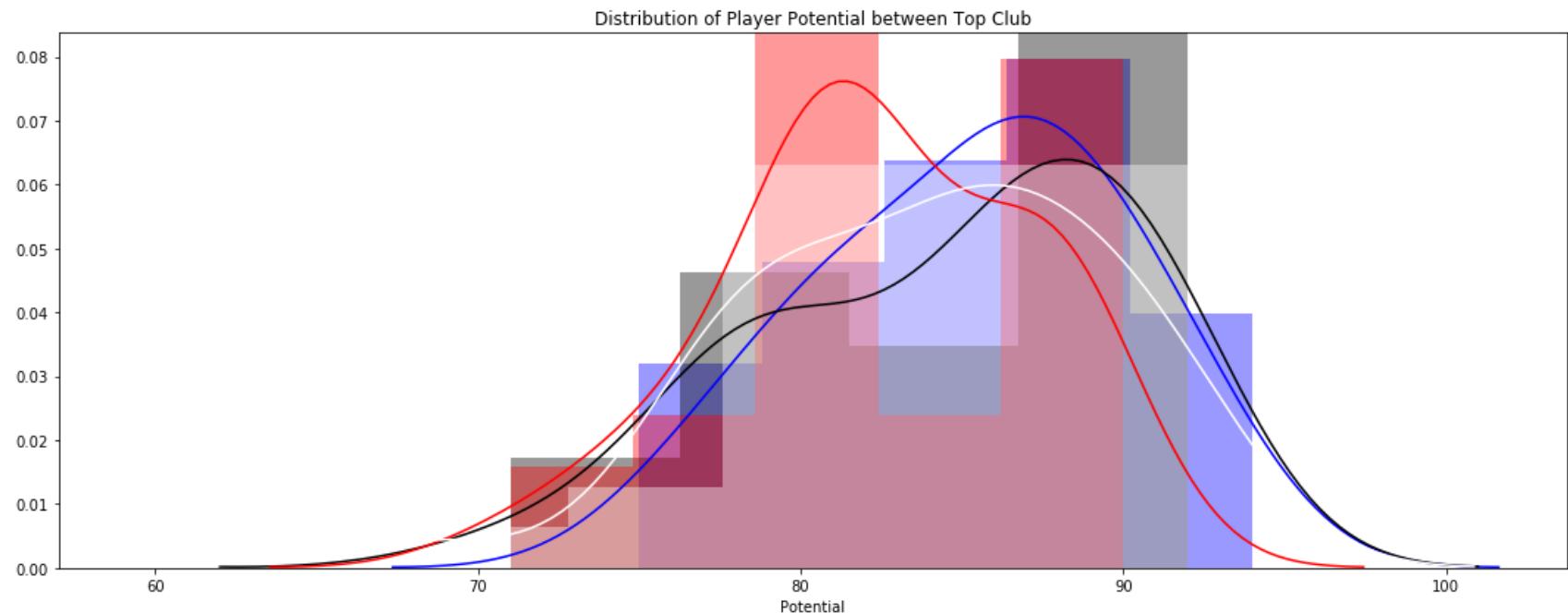
## COMPARING PLAYER WAGE DISTRIBUTION

```
In [77]: plt.figure(1, figsize = (15, 6))
sns.distplot(barca["Wage_num"], color = "blue")
sns.distplot(madrid["Wage_num"], color = "black")
sns.distplot(liverpool["Wage_num"], color = "red")
sns.distplot(mancity["Wage_num"], color = "white")
plt.title("Comparison of Player Wages between Top Club")
plt.tight_layout()
plt.show()
```



## COMPARING PLAYER POTENTIAL

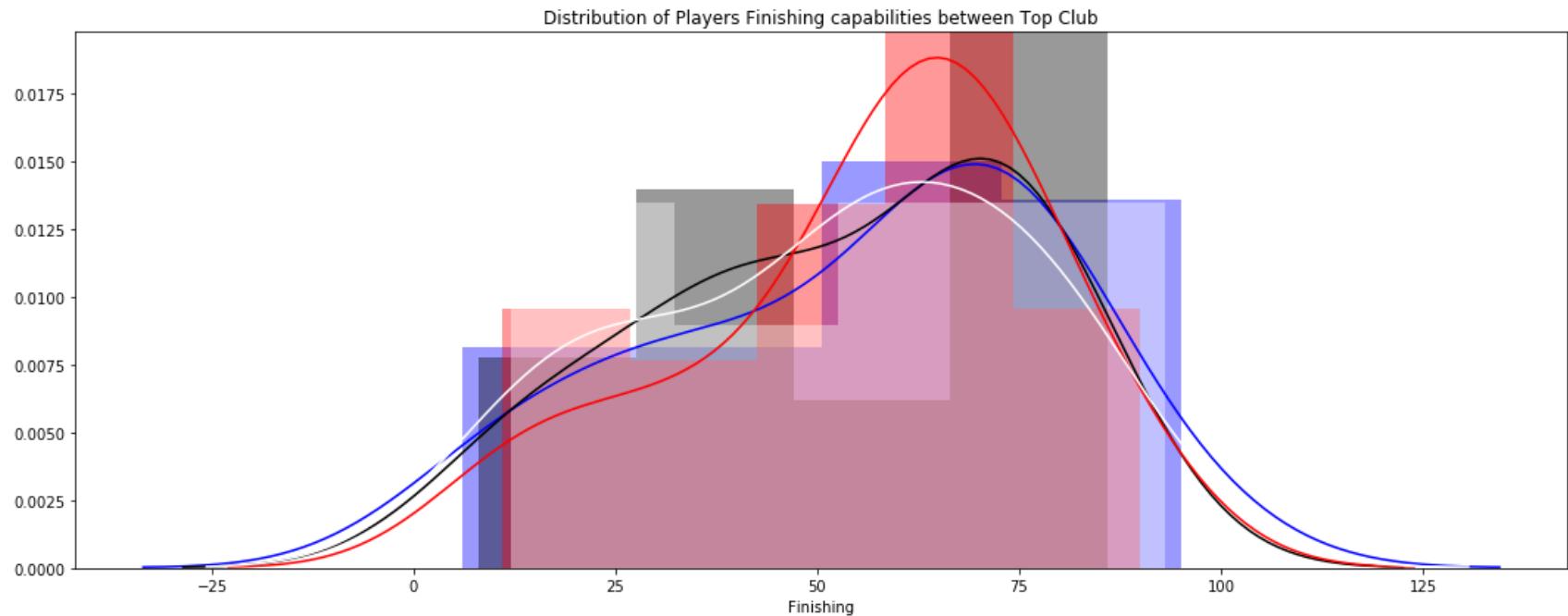
```
In [78]: plt.figure(1, figsize = (15, 6))
sns.distplot(barca["Potential"], color = "blue")
sns.distplot(madrid["Potential"], color = "black")
sns.distplot(liverpool["Potential"], color = "red")
sns.distplot(mancity["Potential"], color = "white")
plt.title("Distribution of Player Potential between Top Club")
plt.tight_layout()
plt.show()
```



COMPARING PLAYERS FINISHING

BETTER FINISHING LEADS TO MORE GOALS SCORED

```
In [79]: plt.figure(1, figsize = (15, 6))
sns.distplot(barca["Finishing"], color = "blue")
sns.distplot(madrid["Finishing"], color = "black")
sns.distplot(liverpool["Finishing"], color = "red")
sns.distplot(mancity["Finishing"], color = "white")
plt.title("Distribution of Players Finishing capabilities between Top Club")
plt.tight_layout()
plt.show()
```



COUNTPLOT : PLAYER DISTRIBUTION WITH RESPECT TO COUNTRY

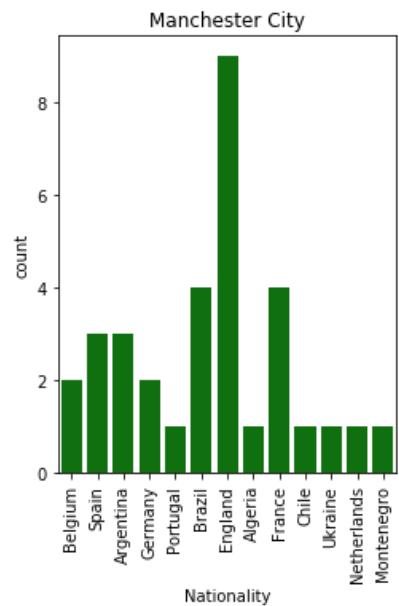
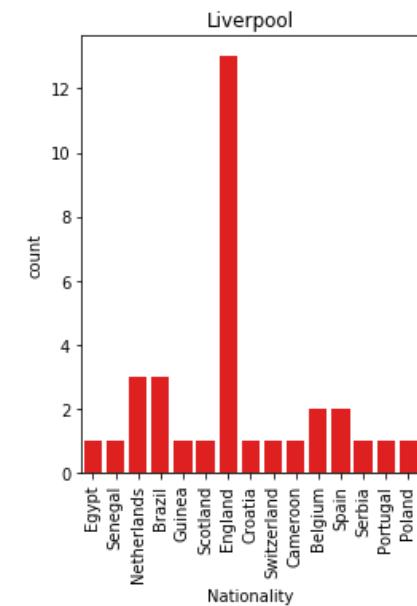
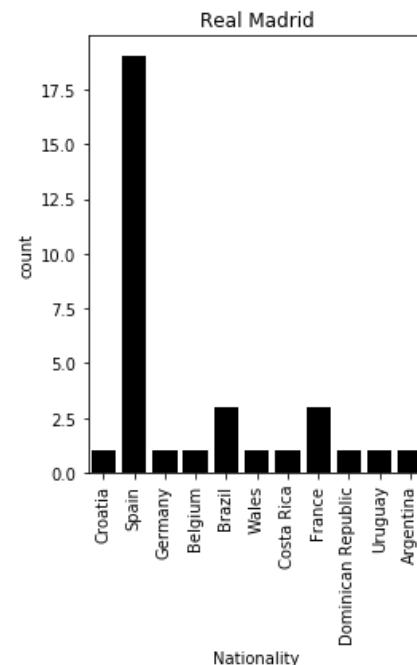
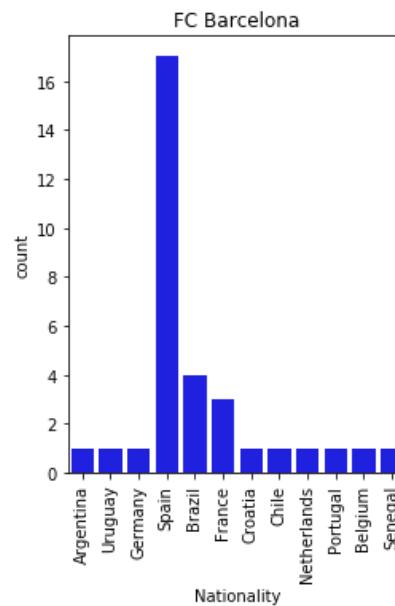
```
In [80]: plt.figure(1, figsize = (15, 6))
```

```
plt.subplot(1, 4, 1)
sns.countplot(barca["Nationality"], color = "blue")
plt.xticks(rotation=90)
plt.title("FC Barcelona")

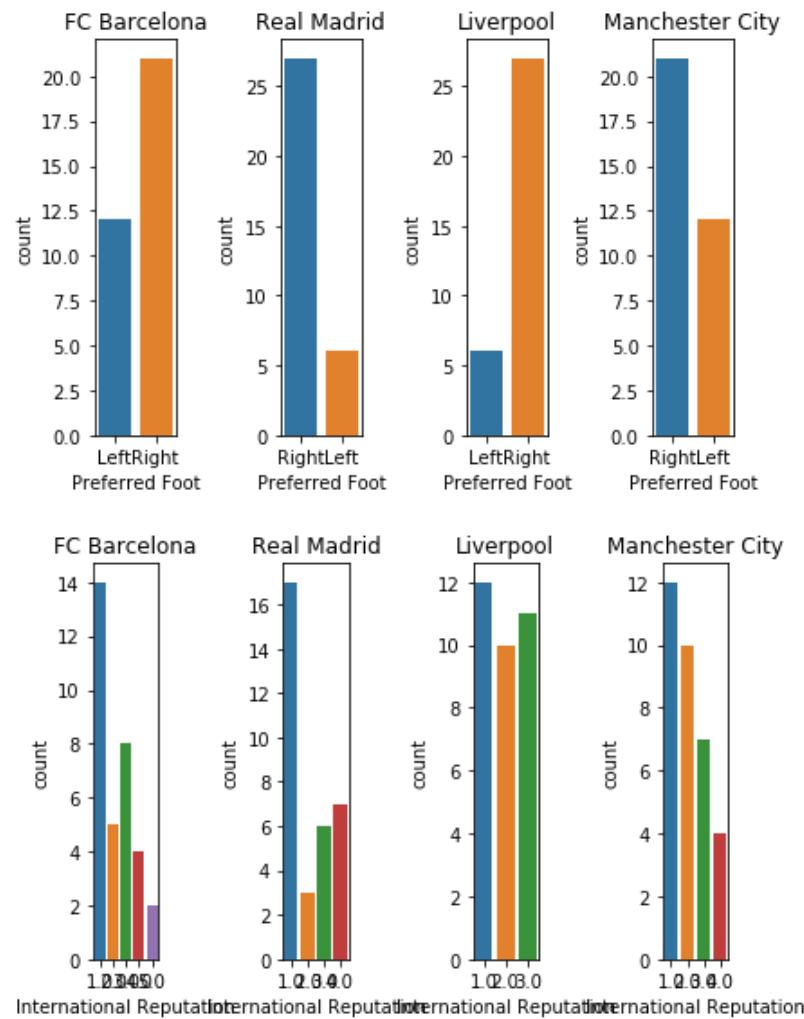
plt.subplot(1, 4, 2)
sns.countplot(madrid["Nationality"], color = "black")
plt.xticks(rotation=90)
plt.title("Real Madrid")

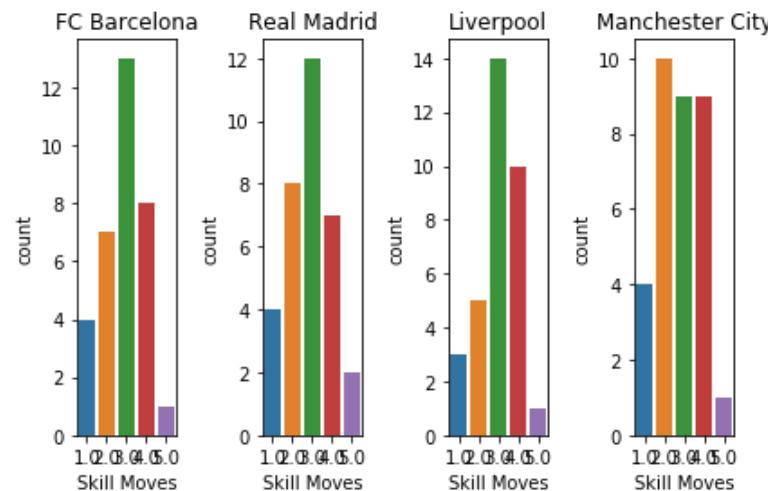
plt.subplot(1, 4, 3)
sns.countplot(liverpool["Nationality"], color = "red")
plt.xticks(rotation=90)
plt.title("Liverpool")

plt.subplot(1, 4, 4)
sns.countplot(mancity["Nationality"], color = "green")
plt.xticks(rotation=90)
plt.title("Manchester City")
plt.tight_layout()
plt.show()
```



```
In [81]: cols = ["Preferred Foot", "International Reputation", 'Skill Moves']
for col in cols:
    plt.subplot(1, 4, 1)
    sns.countplot(barca[col])
    plt.title("FC Barcelona")
    plt.subplot(1, 4, 2)
    sns.countplot(madrid[col])
    plt.title("Real Madrid")
    plt.subplot(1, 4, 3)
    sns.countplot(liverpool[col])
    plt.title("Liverpool")
    plt.subplot(1, 4, 4)
    sns.countplot(mancity[col])
    plt.title("Manchester City")
    plt.tight_layout()
plt.show()
```





## BRAIN BEHIND SUCCESSFULL TEAMS

### THE COACH/MANAGERS

LEFT : PEP GUARDIOLA, CLUBS : FC BARCELONA, FC BAYERN, MANCHESTER CITY

CENTER : ZINEDINE ZIDANE, CLUB : REAL MADRID

RIGHT : JURGEN KLOPP, CLUBS : BORUSSIA DORTMUND, LIVERPOOL

```
In [91]: plt.figure(1, figsize = (15, 20))
img = mpimg.imread("managers.jpg")
plt.imshow(img)
plt.show()
```



THEY PLAY A VITAL PART IN TEAMS SUCCESS