```
In [4]: import numpy as np
        import pandas as pd
        import matplotlib.pyplot as plt
        import seaborn as sns
```

```
In [5]: data = pd.read_csv ('fifa_data.csv')

        fifa = data.copy()
        fifa.head()
```

Out[5]:

	Unnamed: 0	ID	Name	Age	Photo	Nationality	Flag	Overall	Potential	Club	...	Co
0	0	158023	L. Messi	31	https://cdn.sofifa.org/players/4/19/158023.png	Argentina	https://cdn.sofifa.org/flags/52.png	94	94	FC Barcelona	...	
1	1	20801	Cristiano Ronaldo	33	https://cdn.sofifa.org/players/4/19/20801.png	Portugal	https://cdn.sofifa.org/flags/38.png	94	94	Juventus	...	
2	2	190871	Neymar Jr	26	https://cdn.sofifa.org/players/4/19/190871.png	Brazil	https://cdn.sofifa.org/flags/54.png	92	93	Paris Saint-Germain	...	
3	3	193080	De Gea	27	https://cdn.sofifa.org/players/4/19/193080.png	Spain	https://cdn.sofifa.org/flags/45.png	91	93	Manchester United	...	
4	4	192985	K. De Bruyne	27	https://cdn.sofifa.org/players/4/19/192985.png	Belgium	https://cdn.sofifa.org/flags/7.png	91	92	Manchester City	...	

5 rows × 89 columns

```
In [6]: fifa.drop(columns=['Unnamed: 0'], inplace=True)
        fifa.head()
```

Out[6]:

	ID	Name	Age	Photo	Nationality	Flag	Overall	Potential	Club	
0	158023	L. Messi	31	https://cdn.sofifa.org/players/4/19/158023.png	Argentina	https://cdn.sofifa.org/flags/52.png	94	94	FC Barcelona	https://cdn.sofifa.org/
1	20801	Cristiano Ronaldo	33	https://cdn.sofifa.org/players/4/19/20801.png	Portugal	https://cdn.sofifa.org/flags/38.png	94	94	Juventus	https://cdn.sofifa.org
2	190871	Neymar Jr	26	https://cdn.sofifa.org/players/4/19/190871.png	Brazil	https://cdn.sofifa.org/flags/54.png	92	93	Paris Saint-Germain	https://cdn.sofifa.org
3	193080	De Gea	27	https://cdn.sofifa.org/players/4/19/193080.png	Spain	https://cdn.sofifa.org/flags/45.png	91	93	Manchester United	https://cdn.sofifa.or
4	192985	K. De Bruyne	27	https://cdn.sofifa.org/players/4/19/192985.png	Belgium	https://cdn.sofifa.org/flags/7.png	91	92	Manchester City	https://cdn.sofifa.or

5 rows × 88 columns

```
In [29]: type(fifa)
```

Out[29]: pandas.core.frame.DataFrame

```
In [8]: fifa.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 18207 entries, 0 to 18206
Data columns (total 88 columns):
 #   Column                 Non-Null Count  Dtype
---  ------                 --------------  -----
 0   ID                     18207 non-null  int64
 1   Name                   18207 non-null  object
 2   Age                    18207 non-null  int64
 3   Photo                  18207 non-null  object
 4   Nationality            18207 non-null  object
 5   Flag                   18207 non-null  object
 6   Overall                18207 non-null  int64
 7   Potential              18207 non-null  int64
 8   Club                   17966 non-null  object
 9   Club Logo              18207 non-null  object
 10  Value                  18207 non-null  object
 11  Wage                   18207 non-null  object
 12  Special                18207 non-null  int64
 13  Preferred Foot         18159 non-null  object
 14  International Reputation 18159 non-null float64
 15  Weak Foot              18159 non-null  float64
 16  Skill Moves            18159 non-null  float64
 17  Work Rate              18159 non-null  object
 18  Body Type              18159 non-null  object
 19  Real Face              18159 non-null  object
 20  Position               18147 non-null  object
 21  Jersey Number          18147 non-null  float64
 22  Joined                 16654 non-null  object
 23  Loaned From            1264 non-null   object
 24  Contract Valid Until   17918 non-null  object
 25  Height                 18159 non-null  object
 26  Weight                 18159 non-null  object
 27  LS                     16122 non-null  object
 28  ST                     16122 non-null  object
 29  RS                     16122 non-null  object
 30  LW                     16122 non-null  object
 31  LF                     16122 non-null  object
 32  CF                     16122 non-null  object
```

```
 33  RF                  16122 non-null  object
 34  RW                  16122 non-null  object
 35  LAM                 16122 non-null  object
 36  CAM                 16122 non-null  object
 37  RAM                 16122 non-null  object
 38  LM                  16122 non-null  object
 39  LCM                 16122 non-null  object
 40  CM                  16122 non-null  object
 41  RCM                 16122 non-null  object
 42  RM                  16122 non-null  object
 43  LWB                 16122 non-null  object
 44  LDM                 16122 non-null  object
 45  CDM                 16122 non-null  object
 46  RDM                 16122 non-null  object
 47  RWB                 16122 non-null  object
 48  LB                  16122 non-null  object
 49  LCB                 16122 non-null  object
 50  CB                  16122 non-null  object
 51  RCB                 16122 non-null  object
 52  RB                  16122 non-null  object
 53  Crossing            18159 non-null  float64
 54  Finishing           18159 non-null  float64
 55  HeadingAccuracy     18159 non-null  float64
 56  ShortPassing        18159 non-null  float64
 57  Volleys             18159 non-null  float64
 58  Dribbling           18159 non-null  float64
 59  Curve               18159 non-null  float64
 60  FKAccuracy          18159 non-null  float64
 61  LongPassing         18159 non-null  float64
 62  BallControl         18159 non-null  float64
 63  Acceleration        18159 non-null  float64
 64  SprintSpeed         18159 non-null  float64
 65  Agility             18159 non-null  float64
 66  Reactions           18159 non-null  float64
 67  Balance             18159 non-null  float64
 68  ShotPower           18159 non-null  float64
 69  Jumping             18159 non-null  float64
 70  Stamina             18159 non-null  float64
 71  Strength            18159 non-null  float64
 72  LongShots           18159 non-null  float64
 73  Aggression          18159 non-null  float64
 74  Interceptions       18159 non-null  float64
 75  Positioning         18159 non-null  float64
 76  Vision              18159 non-null  float64
 77  Penalties           18159 non-null  float64
 78  Composure           18159 non-null  float64
 79  Marking             18159 non-null  float64
 80  StandingTackle      18159 non-null  float64
 81  SlidingTackle       18159 non-null  float64
 82  GKDiving            18159 non-null  float64
 83  GKHandling          18159 non-null  float64
 84  GKKicking           18159 non-null  float64
 85  GKPositioning       18159 non-null  float64
 86  GKReflexes          18159 non-null  float64
 87  Release Clause      16643 non-null  object
dtypes: float64(38), int64(5), object(45)
memory usage: 12.2+ MB
```

1. Which country has the most number of player

```
In [9]:  most_players_country = fifa['Nationality'].value_counts().idxmax()
         total_players = fifa['Nationality'].value_counts().max()

         print(f"1. Country with the most number of players is: {most_players_country} Total players are: {total_players}")
```

```
1. Country with the most number of players is: England Total players are: 1662
```

2. Plot a bar chart of the top 5 countries with the most number of players

```
In [10]:  top_5_countries = fifa['Nationality'].value_counts().head(5)

          # Define patterns for bars
          patterns = ['/', 'o', '\\', 'x', '.']

          # Define colors for bars (you can specify your own colors)
          colors = ['blue', 'green', 'red', 'purple', 'orange']

          # Create a bar chart with different patterns
          ax = top_5_countries.plot(kind='bar', figsize=(10, 6), color=colors, alpha=0.6)

          # Apply patterns to the bars
          bars = ax.patches
          for bar, pattern in zip(bars, patterns):
              bar.set_hatch(pattern)

          # Set the title and labels
          plt.title('Top 5 Countries with Most Players')
          plt.xlabel('Country')
          plt.ylabel('Number of Players')

          plt.show()
```
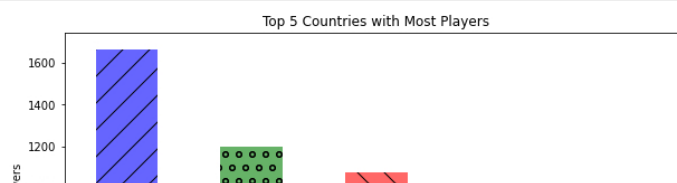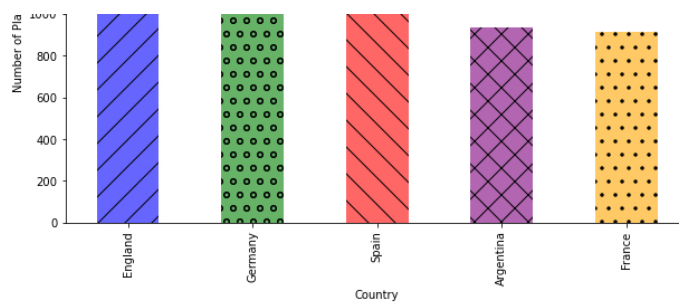
3. Which player has the highest salary

```
In [11]:  # Convert the 'Wage' column to a numeric format
          fifa['Wage'] = fifa['Wage'].str.replace('€', '').str.replace('K', '').astype(float)

          # Find the player with the highest salary
          highest_salary_player = fifa[fifa['Wage'] == fifa['Wage'].max()]

          # Print the player with the highest salary
          print(f"Player with the highest salary:\n{highest_salary_player[['Name','Wage']]}")
```

```
Player with the highest salary:
       Name   Wage
0   L. Messi  565.0
```

4.Plot a histogram to get the salary range of the players

```
In [28]:  bins = np.arange(0,150,20)
          # Create a histogram of player salaries
          plt.figure(figsize=(8, 6))
          plt.hist(fifa['Wage'], bins=bins, color='skyblue', edgecolor='black')

          plt.xticks(bins)

          # Set the title and labels
          plt.title('Salary Range of Players')
          plt.xlabel('Salary (in millions €)')
          plt.ylabel('Number of Players')

          plt.show()
```
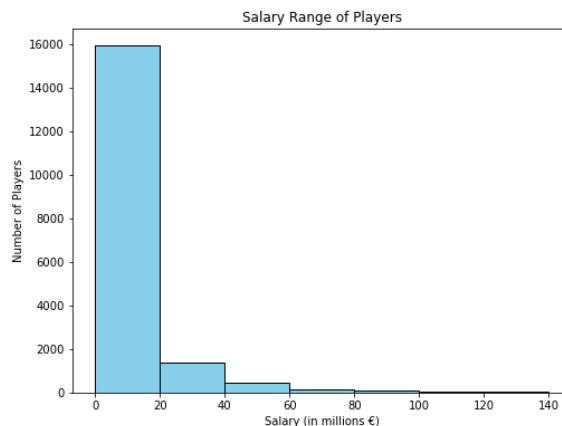


```
In [ ]:  fifa.loc[:, 'Height']
```

5.Who is the tallest player in the fifa players?

```
In [16]:  height = fifa.loc[:, 'Height']
          height_in_ft = [float('.'.join(str(x).split("'")))for x in height]

          height_data = fifa.loc[:, ['Name', 'Height']]

          height_data['Height']= height_in_ft

          max_height= height_data['Height'].max()
          height_data.loc[height_data['Height']==max_height]
```

Out[16]:

	Name	Height
11614	T. Holý	6.9
17927	D. Hodzic	6.9

6. Which club has most number of players

```
In [17]:  most_players_club = fifa['Club'].value_counts().idxmax()
          total_players = fifa['Club'].value_counts().max()

          print(f"1. Club with the most number of players is: {most_players_club} and Total players are: {total_players}")
```

1. Club with the most number of players is: FC Barcelona and Total players are: 33

7.Which foot is most preferred by the players?Draw a bar chart for preferred foot

In [18]:
```python
# Count the number of players for each preferred foot
preferred_foot_counts = fifa['Preferred Foot'].value_counts()
preferred_foot_counts
```

Out[18]:
```
Right    13948
Left      4211
Name: Preferred Foot, dtype: int64
```

In [19]:
```python
# Count the number of players for each preferred foot
preferred_foot_counts = fifa['Preferred Foot'].value_counts()

# Determine the most preferred foot
most_preferred_foot = preferred_foot_counts.idxmax()

# Create a bar chart
plt.figure(figsize=(8, 6))
sns.barplot(x=preferred_foot_counts.index, y=preferred_foot_counts.values, palette='viridis')
plt.title('Preferred Foot of Players')
plt.xlabel('Preferred Foot')
plt.ylabel('Number of Players')
plt.show()

print(f"The most preferred foot by players is {most_preferred_foot}.")
```
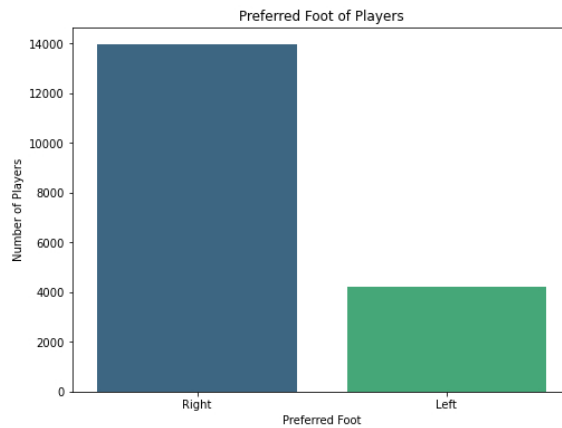

The most preferred foot by players is Right.

In [ ]: