Olympic Atheletes Dataset from 1896 to 2016

- Dataset has two files, One is main file which has all record of Winner Region wise

- 2nd file has NOC file with National Olympic Committee Codes

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

%matplotlib inline
```

In [ ]:
```
# Import Dataset
df_athlete= pd.read_csv('athlete_events.csv')
df_noc=pd.read_csv('noc_regions.csv')
```

In [ ]:
```
df_athlete.head()
```

Out[ ]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	
0	1	A Dijiang	M	24.0	180.0	80.0	China	CHN	1992 Summer	1992	Summer	Bar
1	2	A Lamusi	M	23.0	170.0	60.0	China	CHN	2012 Summer	2012	Summer	L
2	3	Gunnar Nielsen Aaby	M	24.0	NaN	NaN	Denmark	DEN	1920 Summer	1920	Summer	Antw
3	4	Edgar Lindenau Aabye	M	34.0	NaN	NaN	Denmark/Sweden	DEN	1900 Summer	1900	Summer	
4	5	Christine Jacoba Aaftink	F	21.0	185.0	82.0	Netherlands	NED	1988 Winter	1988	Winter	C

In [ ]:
```
df_noc.head()
```

Out[ ]:

	NOC	region	notes
0	AFG	Afghanistan	NaN
1	AHO	Curacao	Netherlands Antilles
2	ALB	Albania	NaN
3	ALG	Algeria	NaN
4	AND	Andorra	NaN

Merge Two Dataset to make one file for EDA

In [ ]:
```
df_athlete_join=df_athlete.merge(df_noc,how='left', on='NOC')
```

In [ ]:
```
# Check first five record of Merged Dataset
df_athlete_join.head()
```

Out[ ]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	
0	1	A Dijiang	M	24.0	180.0	80.0	China	CHN	1992 Summer	1992	Summer	Bar
1	2	A Lamusi	M	23.0	170.0	60.0	China	CHN	2012 Summer	2012	Summer	L
2	3	Gunnar Nielsen Aaby	M	24.0	NaN	NaN	Denmark	DEN	1920 Summer	1920	Summer	Antw
3	4	Edgar Lindenau Aabye	M	34.0	NaN	NaN	Denmark/Sweden	DEN	1900 Summer	1900	Summer	
4	5	Christine Jacoba Aaftink	F	21.0	185.0	82.0	Netherlands	NED	1988 Winter	1988	Winter	C

In [ ]:
```
print("Dataset has",df_athlete_join.shape[0],"No of Rows")
```

```
Dataset has 271116 No of Rows
```

In [ ]:
```
print("Dataset has",df_athlete_join.shape[1],"No of Columns")
```

```
Dataset has 17 No of Columns
```

In [ ]:
```
# Check Column Names
df_athlete_join.columns
```

Out[ ]:
```
Index(['ID', 'Name', 'Sex', 'Age', 'Height', 'Weight', 'Team', 'NOC', 'Games',
       'Year', 'Season', 'City', 'Sport', 'Event', 'Medal', 'region', 'notes'],
      dtype='object')
```

In [ ]:
```
# Change the Columns Names
df_athlete_join.rename(columns={'region':'Region', 'notes':'Notes'}, inplace=True)
```

In [ ]:
```
df_athlete_join.head()
```

Out[ ]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	
0	1	A Dijiang	M	24.0	180.0	80.0	China	CHN	1992 Summer	1992	Summer	Bar
1	2	A Lamusi	M	23.0	170.0	60.0	China	CHN	2012 Summer	2012	Summer	L
2	3	Gunnar Nielsen Aaby	M	24.0	NaN	NaN	Denmark	DEN	1920 Summer	1920	Summer	Antw
3	4	Edgar Lindenau Aabye	M	34.0	NaN	NaN	Denmark/Sweden	DEN	1900 Summer	1900	Summer	
4	5	Christine Jacoba Aaftink	F	21.0	185.0	82.0	Netherlands	NED	1988 Winter	1988	Winter	C

In [ ]:
```
# Check Null Values
df_athlete_join.isnull().sum()
```

Out[ ]:
```
ID             0
Name           0
Sex            0
Age         9474
Height     60171
Weight     62875
Team           0
NOC            0
Games          0
Year           0
Season         0
City           0
Sport          0
Event          0
Medal     231333
Region       370
Notes     266077
dtype: int64
```

In [ ]:
```
# Check the dataset Structure
df_athlete_join.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 271116 entries, 0 to 271115
Data columns (total 17 columns):
 #   Column  Non-Null Count   Dtype  
---  ------  --------------   -----  
 0   ID      271116 non-null  int64  
 1   Name    271116 non-null  object 
 2   Sex     271116 non-null  object 
 3   Age     261642 non-null  float64
 4   Height  210945 non-null  float64
 5   Weight  208241 non-null  float64
 6   Team    271116 non-null  object 
 7   NOC     271116 non-null  object 
 8   Games   271116 non-null  object 
 9   Year    271116 non-null  int64  
 10  Season  271116 non-null  object 
 11  City    271116 non-null  object 
 12  Sport   271116 non-null  object 
 13  Event   271116 non-null  object 
 14  Medal   39783 non-null   object 
 15  Region  270746 non-null  object 
 16  Notes   5039 non-null    object 
dtypes: float64(3), int64(2), object(12)
memory usage: 37.2+ MB
```

In [ ]:
```
# Descriptive Analysis
df_athlete_join.describe()
```

Out[ ]:

	ID	Age	Height	Weight	Year
count	271116.000000	261642.000000	210945.000000	208241.000000	271116.000000
mean	68248.954396	25.556898	175.338970	70.702393	1978.378480
std	39022.286345	6.393561	10.518462	14.348020	29.877632
min	1.000000	10.000000	127.000000	25.000000	1896.000000
25%	34643.000000	21.000000	168.000000	60.000000	1960.000000
50%	68205.000000	24.000000	175.000000	70.000000	1988.000000
75%	102097.250000	28.000000	183.000000	79.000000	2002.000000
max	135571.000000	97.000000	226.000000	214.000000	2016.000000

View Record of Pakistani Team in Dataset

In [ ]:
```
df_athlete_join[df_athlete_join.Team=='Pakistan']
```

Out[ ]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season
233	111	Aqarab Abbas	M	22.0	190.0	88.0	Pakistan	PAK	1996 Summer	1996	Summer
237	115	Ghulam Abbas	M	24.0	181.0	74.0	Pakistan	PAK	1992 Summer	1992	Summer
245	121	Muhammad Abbas	M	23.0	168.0	55.0	Pakistan	PAK	2010 Winter	2010	Winter
247	123	Sohail Abbas	M	25.0	178.0	80.0	Pakistan	PAK	2000 Summer	2000	Summer
248	123	Sohail Abbas	M	29.0	178.0	80.0	Pakistan	PAK	2004 Summer	2004	Summer
...	...	...	...	...	...	...	...	...	...	...	...
268234	134200	Aurang Zeb	M	29.0	NaN	NaN	Pakistan	PAK	1952 Summer	1952	Summer
268235	134200	Aurang Zeb	M	29.0	NaN	NaN	Pakistan	PAK	1952 Summer	1952	Summer
269610	134907	Qamar Zia	M	22.0	168.0	61.0	Pakistan	PAK	1976 Summer	1976	Summer
269611	134908	Qasim Zia	M	22.0	174.0	71.0	Pakistan	PAK	1984 Summer	1984	Summer
270584	135329	Muhammad Zubair	M	19.0	167.0	54.0	Pakistan	PAK	2008 Summer	2008	Summer

562 rows × 17 columns

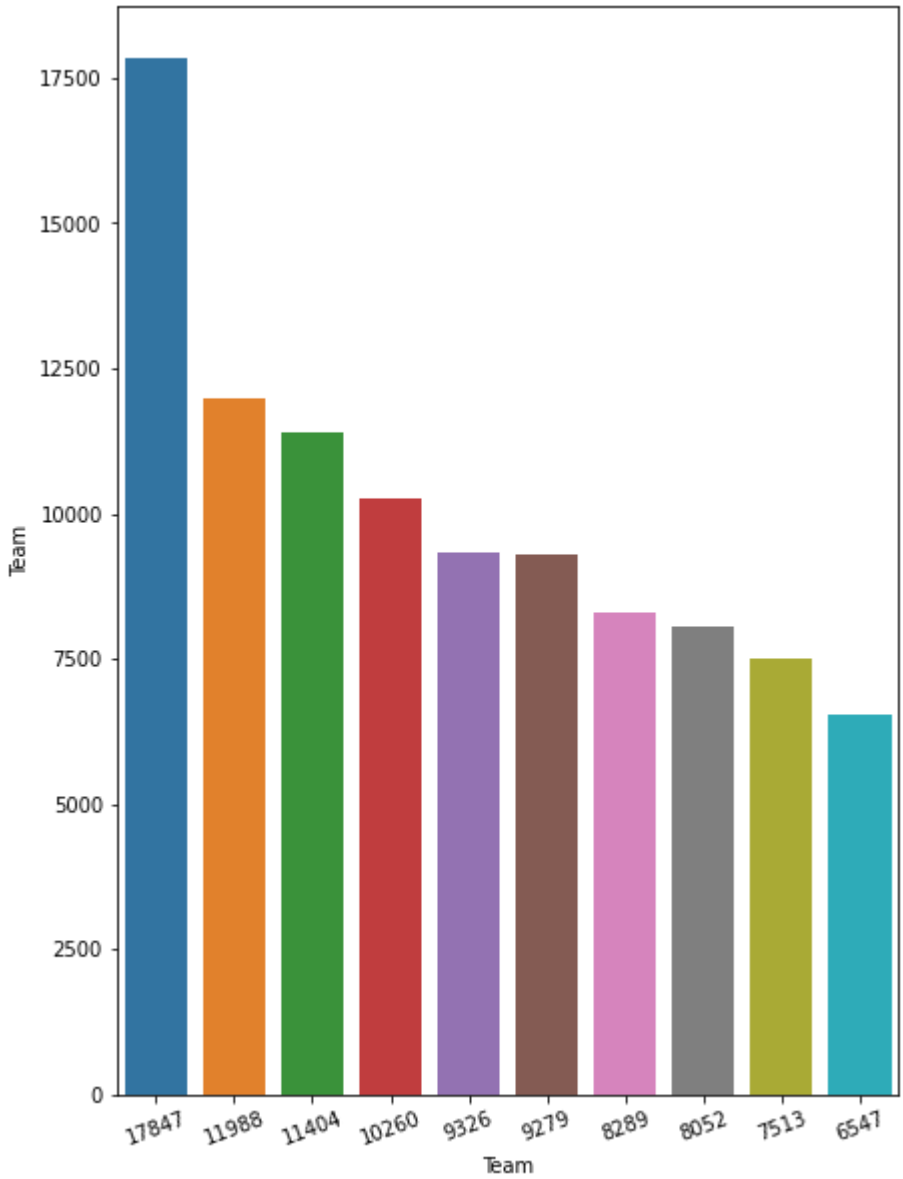
No of Top 10 Countries (Athelete Teams participated)

In [ ]:
```
top_10_countries=df_athlete_join.Team.value_counts().sort_values(ascending=False).h
top_10_countries
```

Out[ ]:
```
United States    17847
France           11988
Great Britain    11404
Italy            10260
Germany           9326
Canada            9279
Japan             8289
Sweden            8052
Australia         7513
Hungary           6547
Name: Team, dtype: int64
```

In [ ]:
```
plt.figure(figsize=(7,10))
plt.xticks(rotation=20)
sns.barplot(data=top_10_countries,x=top_10_countries.index, y=top_10_countries,orde
```

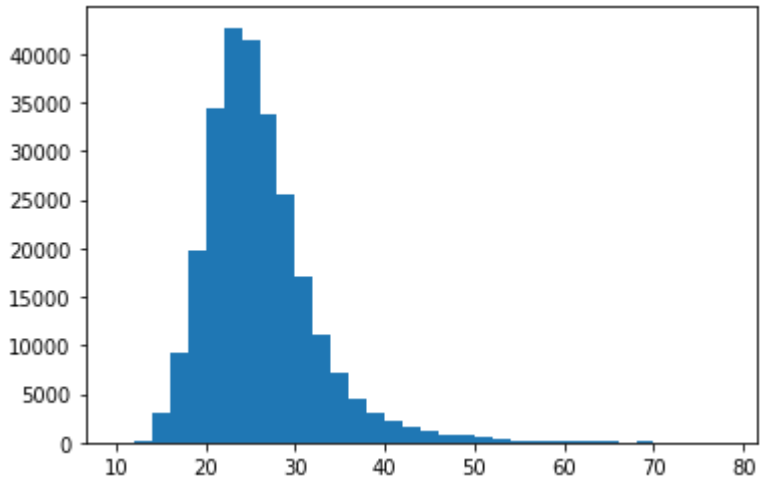
Out[ ]:
```
<AxesSubplot:xlabel='Team', ylabel='Team'>
```



Visualize the Age column distribution

In [ ]:
```
plt.hist(df_athlete_join.Age, bins=np.arange(10,80,2))
```

Out[ ]:
```
(array([1.4000e+01, 2.2600e+02, 3.0400e+03, 9.2280e+03, 1.9795e+04,
        3.4422e+04, 4.2689e+04, 4.1427e+04, 3.3700e+04, 2.5506e+04,
        1.7047e+04, 1.1046e+04, 7.1180e+03, 4.4560e+03, 3.0170e+03,
        2.1630e+03, 1.6590e+03, 1.2670e+03, 8.3700e+02, 7.6900e+02,
        4.7700e+02, 4.4400e+02, 2.6600e+02, 2.0000e+02, 1.7100e+02,
        1.5600e+02, 1.1800e+02, 1.1400e+02, 5.6000e+01, 8.5000e+01,
        6.1000e+01, 3.2000e+01, 1.6000e+01, 9.0000e+00]),
 array([10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42,
        44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76,
        78]),
 <BarContainer object of 34 artists>)
```



Check the Winter Season Olympic Sports

In [ ]:
```
winter_season_sports= df_athlete_join[df_athlete_join.Season=="Winter"].Sport.uniqu
winter_season_sports
```

Out[ ]:
```
array(['Speed Skating', 'Cross Country Skiing', 'Ice Hockey', 'Biathlon',
       'Alpine Skiing', 'Luge', 'Bobsleigh', 'Figure Skating',
       'Nordic Combined', 'Freestyle Skiing', 'Ski Jumping', 'Curling',
       'Snowboarding', 'Short Track Speed Skating', 'Skeleton',
       'Military Ski Patrol', 'Alpinism'], dtype=object)
```

Check Summer Season Olympic sports

In [ ]:
```
summer_season_sports= df_athlete_join[df_athlete_join.Season=="Summer"].Sport.uniqu
summer_season_sports
```

Out[ ]:
```
array(['Basketball', 'Judo', 'Football', 'Tug-Of-War', 'Athletics',
       'Swimming', 'Badminton', 'Sailing', 'Gymnastics',
       'Art Competitions', 'Handball', 'Weightlifting', 'Wrestling',
       'Water Polo', 'Hockey', 'Rowing', 'Fencing', 'Equestrianism',
       'Shooting', 'Boxing', 'Taekwondo', 'Cycling', 'Diving', 'Canoeing',
       'Tennis', 'Modern Pentathlon', 'Golf', 'Softball', 'Archery',
       'Volleyball', 'Synchronized Swimming', 'Table Tennis', 'Baseball',
       'Rhythmic Gymnastics', 'Rugby Sevens', 'Trampolining',
       'Beach Volleyball', 'Triathlon', 'Rugby', 'Lacrosse', 'Polo',
       'Cricket', 'Ice Hockey', 'Racquets', 'Motorboating', 'Croquet',
       'Figure Skating', 'Jeu De Paume', 'Roque', 'Basque Pelota',
       'Alpinism', 'Aeronautics'], dtype=object)
```

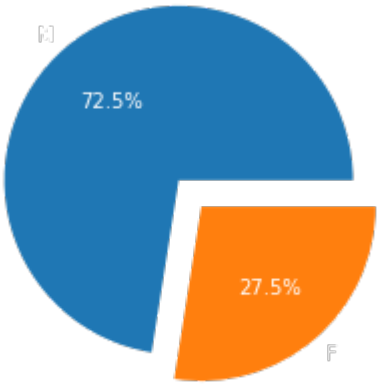
Check Total number of Males and Females Participated in Atheletes Olympics

In [ ]:
```
Gender_Player_count= df_athlete_join['Sex'].value_counts()
Gender_Player_count
```

Out[ ]:
```
M    196594
F     74522
Name: Sex, dtype: int64
```

In [ ]:
```
my_explode=(0.2,0.0)
plt.pie(Gender_Player_count,labels=Gender_Player_count.index, autopct='%1.1f%%',tex
```

Out[ ]:
```
([<matplotlib.patches.Wedge at 0x1b2cc2eb880>,
  <matplotlib.patches.Wedge at 0x1b2cc2ebfa0>],
 [Text(-0.8446821101731202, 0.9881862844390652, 'M'),
  Text(0.7147309380136029, -0.8361576922125369, 'F')],
 [Text(-0.5198043754911509, 0.6081146365778862, '72.5%'),
  Text(0.38985323891651064, -0.45608601393411097, '27.5%')])
```



Check total No of Medal with Medal Categories

In [ ]:
```
total_medals=df_athlete_join.Medal.value_counts()
total_medals
```

Out[ ]:
```
Gold      13372
Bronze    13295
Silver    13116
Name: Medal, dtype: int64
```

Check how many medal Pakistan achieved during from 1896 till 2016

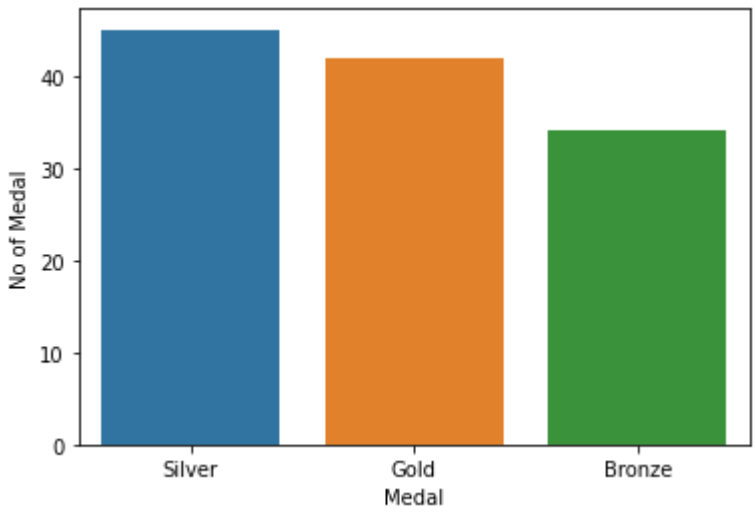
In [ ]:
```
from ast import IsNot
from asyncio.windows_events import NULL
from cmath import isnan

medal_won_by_pakistan= df_athlete_join[(df_athlete_join.Team=='Pakistan') & (df_ath
medal_won_by_pakistan
```

Out[ ]:

	Team	Medal	0
0	Pakistan	Silver	45
1	Pakistan	Gold	42
2	Pakistan	Bronze	34

In [ ]:
```
sns.barplot(data=medal_won_by_pakistan,x=medal_won_by_pakistan.Medal,y=medal_won_by
plt.ylabel("No of Medal")
```

Out[ ]:
```
Text(0, 0.5, 'No of Medal')
```



Top 10 Countries Got maximum No of Medals

In [ ]:
```
df_athlete_join.Medal.isin(['Gold','Bronze','Silver']).groupby(df_athlete_join.Team
```

Out[ ]:
```
Team
United States    5219
Soviet Union     2451
Germany          1984
Great Britain    1673
France           1550
Italy            1527
Sweden           1434
Australia        1306
Canada           1243
Hungary          1127
Name: Medal, dtype: int64
```

No of Females Atheletes yearwise

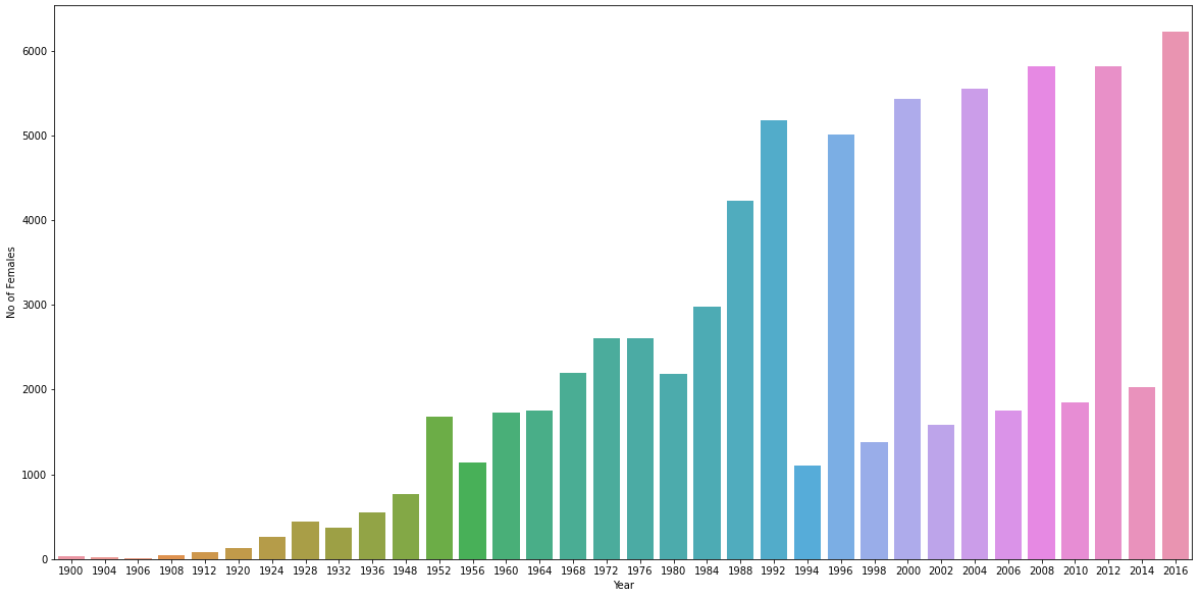
In [ ]:
```
female_count_yearwise=df_athlete_join[df_athlete_join.Sex=='F'][['Sex',"Year"]]
female_count_yearwise1=female_count_yearwise.groupby(female_count_yearwise.Year).co
female_count_yearwise1.head()
```

Out[ ]:

	Year	Sex
0	1900	33
1	1904	16
2	1906	11
3	1908	47
4	1912	87

In [ ]:
```
plt.figure(figsize=(20,10))
sns.barplot(data=female_count_yearwise1, x=female_count_yearwise1.Year,y=female_cou
plt.ylabel("No of Females")
```

Out[ ]:
```
Text(0, 0.5, 'No of Females')
```



Countries Obtained Gold Medals

In [ ]:
```
goldmedal=df_athlete_join[df_athlete_join.Medal=='Gold']
```

Top 5 Countries obtained maxium No of Gold Medals

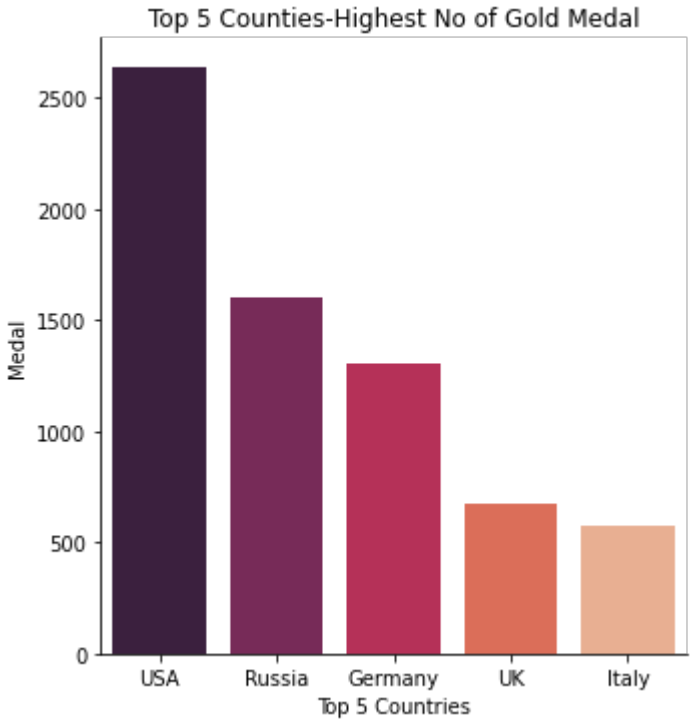
In [ ]:
```
top_5_region_goldmedal=goldmedal.Region.value_counts().sort_values(ascending=False)
top_5_region_goldmedal
```

Out[ ]:

	index	Medal
0	USA	2638
1	Russia	1599
2	Germany	1301
3	UK	678
4	Italy	575

In [ ]:
```
sns.catplot(data=top_5_region_goldmedal,x='index',y='Medal',kind='bar', palette='ro
plt.xlabel("Top 5 Countries")
plt.title("Top 5 Counties-Highest No of Gold Medal")
```

Out[ ]:
```
Text(0.5, 1.0, 'Top 5 Counties-Highest No of Gold Medal')
```



Pakistan obtained Gold Medal till 2016

In [ ]:
```
goldmedal[goldmedal.Region=='Pakistan']['Region'].value_counts()
```

Out[ ]:
```
Pakistan    42
Name: Region, dtype: int64
```

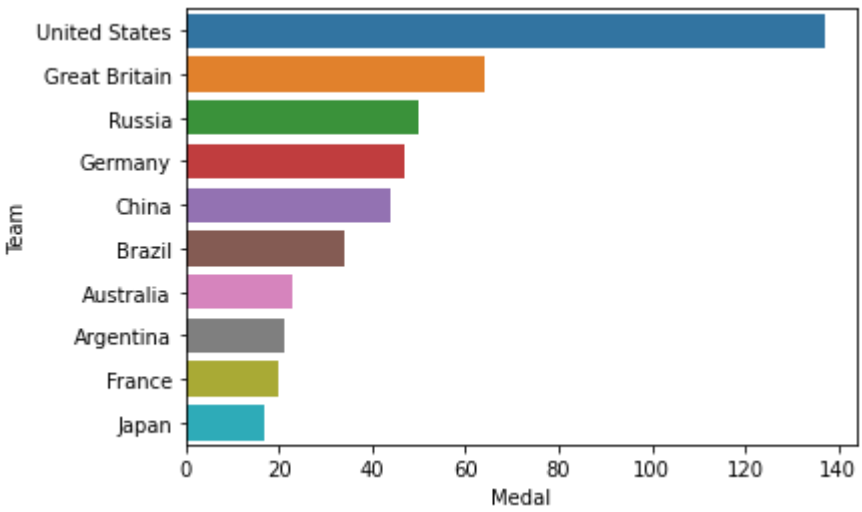
In 2016 , TOP 10 Countries got Gold Medal

In [ ]:
```
top_10_countries_got_gm=goldmedal[goldmedal.Year==2016].groupby(goldmedal.Team)['Te
top_10_countries_got_gm.Team
```

Out[ ]:
```
0    United States
1    Great Britain
2           Russia
3          Germany
4            China
5           Brazil
6        Australia
7        Argentina
8           France
9            Japan
Name: Team, dtype: object
```

In [ ]:
```
sns.barplot(data=top_10_countries_got_gm, y='Team', x=top_10_countries_got_gm.Medal
```

Out[ ]:
```
<AxesSubplot:xlabel='Medal', ylabel='Team'>
```



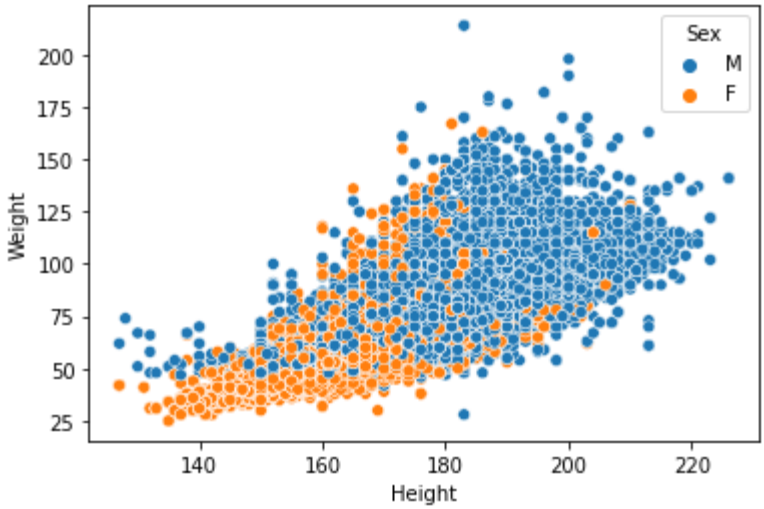
In [ ]:
```
df_athlete_join.Year.min()
```

Out[ ]:
```
1896
```

In [ ]:
```
not_null_relation=df_athlete_join[(df_athlete_join.Height.notnull()) & (df_athlete_
```

In [ ]:
```
sns.scatterplot(data=not_null_relation,x='Height', y='Weight',hue='Sex')
```

Out[ ]:
```
<AxesSubplot:xlabel='Height', ylabel='Weight'>
```



Obsersations: Mostly females are of under Height of 175cm and weight 75kg, while Male are arround Height of 220cm and Weight of 160kg