In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
```

In [ ]:
```

```

In [8]:
```
tokyo = pd.read_excel("athlete_excel.xlsx")
tokyo.head()
```

Out[8]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	City	Sport	Event	Medal
0	1	A Dijiang	M	24.0	180.0	80.0	China	CHN	1992 Summer	1992	Summer	Barcelona	Basketball	Basketball Men's Basketball	NaN
1	2	A Lamusi	M	23.0	170.0	60.0	China	CHN	2012 Summer	2012	Summer	London	Judo	Judo Men's Extra-Lightweight	NaN
2	3	Gunnar Nielsen Aaby	M	24.0	NaN	NaN	Denmark	DEN	1920 Summer	1920	Summer	Antwerpen	Football	Football Men's Football	NaN
3	4	Edgar Lindenau Aabye	M	34.0	NaN	NaN	Denmark/Sweden	DEN	1900 Summer	1900	Summer	Paris	Tug-Of-War	Tug-Of-War Men's Tug-Of-War	Gold
4	5	Christine Jacoba Aaftink	F	21.0	185.0	82.0	Netherlands	NED	1988 Winter	1988	Winter	Calgary	Speed Skating	Speed Skating Women's 500 metres	NaN

In [9]:
```
olympic = pd.read_excel("region_excel.xlsx")
olympic.head()
```

Out[9]:

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

In [11]:
```
data = tokyo.merge(olympic,how = 'left', on = 'NOC')
data.head()
```

Out[11]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	City	Sport	Event	Medal	region	notes
0	1	A Dijiang	M	24.0	180.0	80.0	China	CHN	1992 Summer	1992	Summer	Barcelona	Basketball	Basketball Men's Basketball	NaN	China	NaN
1	2	A Lamusi	M	23.0	170.0	60.0	China	CHN	2012 Summer	2012	Summer	London	Judo	Judo Men's Extra-Lightweight	NaN	China	NaN
2	3	Gunnar Nielsen Aaby	M	24.0	NaN	NaN	Denmark	DEN	1920 Summer	1920	Summer	Antwerpen	Football	Football Men's Football	NaN	Denmark	NaN
3	4	Edgar Lindenau Aabye	M	34.0	NaN	NaN	Denmark/Sweden	DEN	1900 Summer	1900	Summer	Paris	Tug-Of-War	Tug-Of-War Men's Tug-Of-War	Gold	Denmark	NaN
4	5	Christine Jacoba Aaftink	F	21.0	185.0	82.0	Netherlands	NED	1988 Winter	1988	Winter	Calgary	Speed Skating	Speed Skating Women's 500 metres	NaN	Netherlands	NaN

In [12]:
```
data.shape
```

Out[12]:
```
(271116, 17)
```

In [13]:
```
data.rename(columns={'region':'Region','notes':'Notes'},inplace=True)
data.head()
```

Out[13]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	City	Sport	Event	Medal	Region	Notes
0	1	A Dijiang	M	24.0	180.0	80.0	China	CHN	1992 Summer	1992	Summer	Barcelona	Basketball	Basketball Men's Basketball	NaN	China	NaN
1	2	A Lamusi	M	23.0	170.0	60.0	China	CHN	2012 Summer	2012	Summer	London	Judo	Judo Men's Extra-Lightweight	NaN	China	NaN
2	3	Gunnar Nielsen Aaby	M	24.0	NaN	NaN	Denmark	DEN	1920 Summer	1920	Summer	Antwerpen	Football	Football Men's Football	NaN	Denmark	NaN
3	4	Edgar Lindenau Aabye	M	34.0	NaN	NaN	Denmark/Sweden	DEN	1900 Summer	1900	Summer	Paris	Tug-Of-War	Tug-Of-War Men's Tug-Of-War	Gold	Denmark	NaN
4	5	Christine Jacoba Aaftink	F	21.0	185.0	82.0	Netherlands	NED	1988 Winter	1988	Winter	Calgary	Speed Skating	Speed Skating Women's 500 metres	NaN	Netherlands	NaN

In [14]:
```
data.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 [15]:
```
data.describe()
```

Out[15]:

	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%	102067.250000	28.000000	183.000000	79.000000	2002.000000
max	135571.000000	97.000000	226.000000	214.000000	2016.000000

In [16]:
```
data.isnull().sum()
```

Out[16]:
```
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 [24]:
```
data.query('Sport == "Athletics"').head()
```

Out[24]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	City	Sport	Event	Medal	Region	Notes
26	8	Cornelia "Cor" Aalten (-Strannood)	F	18.0	168.0	NaN	Netherlands	NED	1932 Summer	1932	Summer	Los Angeles	Athletics	Athletics Women's 100 metres	NaN	Netherlands	NaN
27	8	Cornelia "Cor" Aalten (-Strannood)	F	18.0	168.0	NaN	Netherlands	NED	1932 Summer	1932	Summer	Los Angeles	Athletics	Athletics Women's 4 x 100 metres Relay	NaN	Netherlands	NaN
57	18	Timo Antero Aaltonen	M	31.0	189.0	130.0	Finland	FIN	2000 Summer	2000	Summer	Sydney	Athletics	Athletics Men's Shot Put	NaN	Finland	NaN
94	31	Evald rma (rman-)	M	24.0	174.0	70.0	Estonia	EST	1936 Summer	1936	Summer	Berlin	Athletics	Athletics Men's Pole Vault	NaN	Estonia	NaN
95	32	Olav Augunson Aarnes	M	23.0	NaN	NaN	Norway	NOR	1912 Summer	1912	Summer	Stockholm	Athletics	Athletics Men's High Jump	NaN	Norway	NaN

In [25]:
```
data.query('Team == "Japan"').head()
```

Out[25]:

	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	City	Sport	Event	Medal	Region	Notes
625	362	Isao Ko Abe	M	24.0	177.0	75.0	Japan	JPN	1936 Summer	1936	Summer	Berlin	Athletics	Athletics Men's Hammer Throw	NaN	Japan	NaN
629	363	Kazumi Abe	M	28.0	178.0	67.0	Japan	JPN	1976 Winter	1976	Winter	Innsbruck	Bobsleigh	Bobsleigh Men's Four	NaN	Japan	NaN
630	364	Kazuo Abe	M	25.0	166.0	69.0	Japan	JPN	1960 Summer	1960	Summer	Roma	Wrestling	Wrestling Men's Lightweight, Freestyle	NaN	Japan	NaN
631	365	Kinya Abe	M	23.0	168.0	68.0	Japan	JPN	1992 Summer	1992	Summer	Barcelona	Fencing	Fencing Men's Foil, Individual	NaN	Japan	NaN
632	366	Kiyoshi Abe	M	25.0	167.0	62.0	Japan	JPN	1972 Summer	1972	Summer	Munich	Wrestling	Wrestling Men's Featherweight, Freestyle	NaN	Japan	NaN

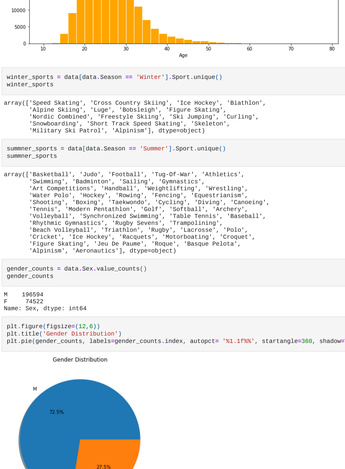
In [32]:
```
top_10 = data.Team.value_counts().sort_values(ascending=False).head()
top_10
```

Out[32]:
```
United States    17847
France           11988
Great Britain    11404
Italy            10260
Germany           9326
Name: Team, dtype: int64
```

In [33]:
```
plt.figure(figsize=(12,6))
plt.title("overall participation by country")
sns.barplot(x=top_10.index , y=top_10 ,palette='Set2')
```

Out[33]:
```
<AxesSubplot:title={'center':'overall participation by country'}, ylabel='Team'>
```

In [37]:
```
plt.figure(figsize=(12,6))
plt.title("Age distribution of the athlete")
plt.xlabel('Age')
plt.ylabel("Number of participants")
plt.hist(data.Age, bins = np.arange(10,80,2), color='orange', edgecolor='white');
```



In [42]:
```
winter_sports = data[data.Season == 'Winter'].Sport.unique()
winter_sports
```

Out[42]:
```
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)
```

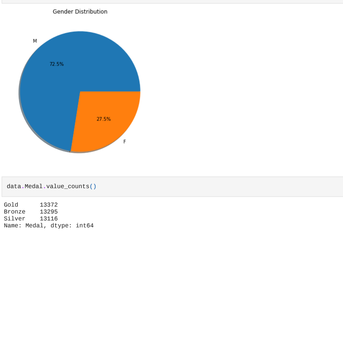
In [45]:
```
summner_sports = data[data.Season == 'Summer'].Sport.unique()
summner_sports
```

Out[45]:
```
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)
```

In [46]:
```
gender_counts = data.Sex.value_counts()
gender_counts
```

Out[46]:
```
M    196594
F     74522
Name: Sex, dtype: int64
```

In [52]:
```
plt.figure(figsize=(12,6))
plt.title('Gender Distribution')
plt.pie(gender_counts, labels=gender_counts.index, autopct= '%1.1f%%', startangle=360, shadow=True);
```



In [53]:
```
data.Medal.value_counts()
```

Out[53]:
```
Gold      13372
Bronze    13295
Silver    13116
Name: Medal, dtype: int64
```