In [23]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [24]:
```
stats=pd.read_excel(r"C:\Users\shaik\Downloads\data.xlsx")
```

In [25]:
```
stats
```

Out[25]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
...	...	...	...	...	...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

195 rows × 5 columns

In [26]:
```
len(stats)
```

Out[26]:
```
195
```

In [27]:
```
stats.columns
```

Out[27]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [28]:
```
len(stats.columns)
```

Out[28]:
```
5
```

In [29]:
```
stats.shape
```

Out[29]:
```
(195, 5)
```

In [30]:
```
stats.isnull()
```

Out[30]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	False	False	False	False	False
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False
4	False	False	False	False	False
...	...	...	...	...	...
190	False	False	False	False	False
191	False	False	False	False	False
192	False	False	False	False	False
193	False	False	False	False	False
194	False	False	False	False	False

195 rows × 5 columns

In [31]:
```
stats.isna()
```

Out[31]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	False	False	False	False	False
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False
4	False	False	False	False	False
...	...	...	...	...	...
190	False	False	False	False	False
191	False	False	False	False	False
192	False	False	False	False	False
193	False	False	False	False	False
194	False	False	False	False	False

195 rows × 5 columns

In [32]:
```
stats.isnull().sum()
```

Out[32]:
```
CountryName      0
CountryCode      0
BirthRate        0
InternetUsers    0
IncomeGroup      0
dtype: int64
```

In [33]:
```
stats.dtypes
```

Out[33]:
```
CountryName       object
CountryCode       object
BirthRate        float64
InternetUsers    float64
IncomeGroup       object
dtype: object
```

In [34]:
```
stats.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 195 entries, 0 to 194
Data columns (total 5 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   CountryName    195 non-null    object 
 1   CountryCode    195 non-null    object 
 2   BirthRate      195 non-null    float64
 3   InternetUsers  195 non-null    float64
 4   IncomeGroup    195 non-null    object 
dtypes: float64(2), object(3)
memory usage: 7.7+ KB
```

In [35]:
```
type(stats)
```

Out[35]:
```
pandas.core.frame.DataFrame
```

In [36]:
```
stats.head()
```

Out[36]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income

In [37]:
```
stats.tail()
```

Out[37]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

In [38]:
```
stats.head(2)
```

Out[38]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income

In [39]:
```
stats.tail(2)
```

Out[39]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

In [40]:
```
stats.columns
```

Out[40]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [41]:
```
stats['CountryName']
```

Out[41]:
```
0                    Aruba
1              Afghanistan
2                   Angola
3                  Albania
4      United Arab Emirates
               ...
190             Yemen, Rep.
191            South Africa
192       Congo, Dem. Rep.
193                  Zambia
194                Zimbabwe
Name: CountryName, Length: 195, dtype: object
```

In [42]:
```
stats['CountryName']
```

Out[42]:
```
0                    Aruba
1              Afghanistan
2                   Angola
3                  Albania
4      United Arab Emirates
               ...
190             Yemen, Rep.
191            South Africa
192       Congo, Dem. Rep.
193                 Zambia
194               Zimbabwe
Name: CountryName, Length: 195, dtype: object
```

In [43]:
```
stats[['CountryName','InternetUsers']]
```

Out[43]:

	CountryName	InternetUsers
0	Aruba	78.9
1	Afghanistan	5.9
2	Angola	19.1
3	Albania	57.2
4	United Arab Emirates	88.0
...	...	...
190	Yemen, Rep.	20.0
191	South Africa	46.5
192	Congo, Dem. Rep.	2.2
193	Zambia	15.4
194	Zimbabwe	18.5

195 rows × 2 columns

lets split the data set to numerical and categorical data

In [44]:
```
#lets split the data set to numerical data and categorical data
stats_numeric_data = stats[['CountryName','InternetUsers']]
```

In [45]:
```
stats_numeric_data.head()
```

Out[45]:

	CountryName	InternetUsers
0	Aruba	78.9
1	Afghanistan	5.9
2	Angola	19.1
3	Albania	57.2
4	United Arab Emirates	88.0

In [49]:
```
stats_categorical_data = stats[['CountryName','InternetUsers','IncomeGroup']]
stats_categorical_data.head()
```

Out[49]:

	CountryName	InternetUsers	IncomeGroup
0	Aruba	78.9	High income
1	Afghanistan	5.9	Low income
2	Angola	19.1	Upper middle income
3	Albania	57.2	Upper middle income
4	United Arab Emirates	88.0	High income

In [50]:
```
print(stats.shape)
print(stats_numeric_data.shape)
print(stats_categorical_data.shape)
```

```
(195, 5)
(195, 2)
(195, 3)
```

Slicing in Pandas

In [51]:
```
stats[:]
```

Out[51]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
...	...	...	...	...	...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

195 rows × 5 columns

In [52]:
```
stats[:4]
```

Out[52]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income

In [53]:
```
stats[10:]
```

Out[53]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
10	Azerbaijan	AZE	18.300	58.7000	Upper middle income
11	Burundi	BDI	44.151	1.3000	Low income
12	Belgium	BEL	11.200	82.1702	High income
13	Benin	BEN	36.440	4.9000	Low income
14	Burkina Faso	BFA	40.551	9.1000	Low income
...	...	...	...	...	...
190	Yemen, Rep.	YEM	32.947	20.0000	Lower middle income
191	South Africa	ZAF	20.850	46.5000	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2000	Low income
193	Zambia	ZMB	40.471	15.4000	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5000	Low income

185 rows × 5 columns

In [54]:
```
stats[5:20]
```

Out[54]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
5	Argentina	ARG	17.716	59.90000	High income
6	Armenia	ARM	13.308	41.90000	Lower middle income
7	Antigua and Barbuda	ATG	16.447	63.40000	High income
8	Australia	AUS	13.200	83.00000	High income
9	Austria	AUT	9.400	80.61880	High income
10	Azerbaijan	AZE	18.300	58.70000	Upper middle income
11	Burundi	BDI	44.151	1.30000	Low income
12	Belgium	BEL	11.200	82.17020	High income
13	Benin	BEN	36.440	4.90000	Low income
14	Burkina Faso	BFA	40.551	9.10000	Low income
15	Bangladesh	BGD	20.142	6.63000	Lower middle income
16	Bulgaria	BGR	9.200	53.06150	Upper middle income
17	Bahrain	BHR	15.040	90.00004	High income
18	Bahamas, The	BHS	15.339	72.00000	High income
19	Bosnia and Herzegovina	BIH	9.062	57.79000	Upper middle income

In [56]:
```
stats[10:160:5]
```

Out[56]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
10	Azerbaijan	AZE	18.300	58.700000	Upper middle income
15	Bangladesh	BGD	20.142	6.630000	Lower middle income
20	Belarus	BLR	12.500	54.170000	Upper middle income
25	Barbados	BRB	12.188	73.000000	High income
30	Canada	CAN	10.900	85.800000	High income
35	Cameroon	CMR	37.236	6.400000	Lower middle income
40	Costa Rica	CRI	15.022	45.960000	Upper middle income
45	Germany	DEU	8.500	84.170000	High income
50	Ecuador	ECU	21.070	40.353684	Upper middle income
55	Ethiopia	ETH	32.925	1.900000	Low income
60	Gabon	GAB	30.555	9.200000	Upper middle income
65	Gambia, The	GMB	42.525	14.000000	Low income
70	Greenland	GRL	14.500	65.800000	High income
75	Honduras	HND	21.593	17.800000	Lower middle income
80	India	IND	20.291	15.100000	Lower middle income
85	Israel	ISR	21.300	70.800000	High income
90	Kazakhstan	KAZ	22.730	54.000000	Upper middle income
95	Korea, Rep.	KOR	8.600	84.770000	High income
100	Libya	LBY	21.425	16.500000	Upper middle income
105	Lithuania	LTU	10.100	68.452900	High income
110	Moldova	MDA	12.141	45.000000	Lower middle income
115	Mali	MLI	44.138	3.500000	Low income
120	Mozambique	MOZ	39.705	5.400000	Low income
125	Namibia	NAM	29.937	13.900000	Upper middle income
130	Netherlands	NLD	10.200	93.956400	High income
135	Pakistan	PAK	29.582	10.900000	Lower middle income
140	Poland	POL	9.600	62.849200	High income
145	Qatar	QAT	11.940	85.300000	High income
150	Sudan	SDN	33.477	22.700000	Lower middle income
155	El Salvador	SLV	17.476	23.109300	Lower middle income

In [57]:
```
stats[::-1]
```

Out[57]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
194	Zimbabwe	ZWE	35.715	18.5	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
191	South Africa	ZAF	20.850	46.5	Upper middle income
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
...	...	...	...	...	...
4	United Arab Emirates	ARE	11.044	88.0	High income
3	Albania	ALB	12.877	57.2	Upper middle income
2	Angola	AGO	45.985	19.1	Upper middle income
1	Afghanistan	AFG	35.253	5.9	Low income
0	Aruba	ABW	10.244	78.9	High income

195 rows × 5 columns

In [58]:
```
stats[::-2]
```

Out[58]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
194	Zimbabwe	ZWE	35.715	18.5	Low income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.6	Lower middle income
186	Vietnam	VNM	15.537	43.9	Lower middle income
...	...	...	...	...	...
8	Australia	AUS	13.200	83.0	High income
6	Armenia	ARM	13.308	41.9	Lower middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
2	Angola	AGO	45.985	19.1	Upper middle income
0	Aruba	ABW	10.244	78.9	High income

98 rows × 5 columns

In [59]:
```
stats[:200]
```

Out[59]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
...	...	...	...	...	...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

195 rows × 5 columns

In [ ]: