In [6]:
```
import pandas as pd
```

In [7]:
```
stats = pd.read_excel(r'C:\Users\ANIL\Desktop\data.xlsx')
```

In [8]:
```
stats
```

Out[8]:

	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 [9]:
```
len(stats)
```

Out[9]:
```
195
```

In [10]:
```
stats.columns
```

Out[10]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [23]:
```
len(stats.columns)
```

Out[23]:
```
5
```

In [24]:
```
stats.shape
```

Out[24]:
```
(195, 5)
```

In [25]:
```
stats.isnull()
```

Out[25]:

	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 [26]:
```
stats.isna()
```

Out[26]:

	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 [27]:
```
stats.isnull().sum()
```

Out[27]:
```
CountryName      0
CountryCode      0
BirthRate        0
InternetUsers    0
IncomeGroup      0
dtype: int64
```

In [28]:
```
stats.dtypes
```

Out[28]:
```
CountryName       object
CountryCode       object
BirthRate        float64
InternetUsers    float64
IncomeGroup       object
dtype: object
```

In [29]:
```
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 [30]:
```
type(stats)
```

Out[30]:
```
pandas.core.frame.DataFrame
```

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

Out[31]:

	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 [32]:
```
stats.tail()
```

Out[32]:

	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 [33]:
```
stats.head(2)
```

Out[33]:

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

In [34]:
```
stats.tail(2)
```

Out[34]:

	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 [35]:
```
stats.columns
```

Out[35]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [36]:
```
stats['CountryName']
```

Out[36]:
```
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 [37]:
```
stats[:]
```

Out[37]:

	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 [38]:
```
stats['BirthRate']
```

Out[38]:
```
0      10.244
1      35.253
2      45.985
3      12.877
4      11.044
        ...
190    32.947
191    20.850
192    42.394
193    40.471
194    35.715
Name: BirthRate, Length: 195, dtype: float64
```

In [40]:
```
stats[['BirthRate', 'InternetUsers']]
```

Out[40]:

	BirthRate	InternetUsers
0	10.244	78.9
1	35.253	5.9
2	45.985	19.1
3	12.877	57.2
4	11.044	88.0
...	...	...
190	32.947	20.0
191	20.850	46.5
192	42.394	2.2
193	40.471	15.4
194	35.715	18.5

195 rows × 2 columns

In [11]:
```
stats.columns
```

Out[11]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

stats_numeric_data = stats[['BirthRate', 'InternetUsers']]

In [13]:
```
stats_numeric_data =stats[['BirthRate', 'InternetUsers']]
```

In [14]:
```
stats_numeric_data.head
```

Out[14]:
```
<bound method NDFrame.head of      BirthRate  InternetUsers
0       10.244           78.9
1       35.253            5.9
2       45.985           19.1
3       12.877           57.2
4       11.044           88.0
..         ...            ...
190     32.947           20.0
191     20.850           46.5
192     42.394            2.2
193     40.471           15.4
194     35.715           18.5

[195 rows x 2 columns]>
```

In [15]:
```
stats_categorical_data = stats[['CountryName', 'CountryCode', 'IncomeGroup']]
stats_categorical_data
```

Out[15]:

	CountryName	CountryCode	IncomeGroup
0	Aruba	ABW	High income
1	Afghanistan	AFG	Low income
2	Angola	AGO	Upper middle income
3	Albania	ALB	Upper middle income
4	United Arab Emirates	ARE	High income
...	...	...	...
190	Yemen, Rep.	YEM	Lower middle income
191	South Africa	ZAF	Upper middle income
192	Congo, Dem. Rep.	COD	Low income
193	Zambia	ZMB	Lower middle income
194	Zimbabwe	ZWE	Low income

195 rows × 3 columns

In [46]:
```
stats
```

Out[46]:

	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 [17]:
```
print(stats.shape)
print(stats_numeric_data.shape)
print(stats_categorical_data.shape)
```

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

Slicing in Pandas

In [47]:
```
stats[:3]
```

Out[47]:

	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

In [49]:
```
stats[3:]
```

Out[49]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
5	Argentina	ARG	17.716	59.9	High income
6	Armenia	ARM	13.308	41.9	Lower middle income
7	Antigua and Barbuda	ATG	16.447	63.4	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

192 rows × 5 columns

In [50]:
```
stats[3:20]
```

Out[50]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
3	Albania	ALB	12.877	57.20000	Upper middle income
4	United Arab Emirates	ARE	11.044	88.00000	High income
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 [51]:
```
stats[3:50:5]
```

Out[51]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
3	Albania	ALB	12.877	57.2000	Upper middle income
8	Australia	AUS	13.200	83.0000	High income
13	Benin	BEN	36.440	4.9000	Low income
18	Bahamas, The	BHS	15.339	72.0000	High income
23	Bolivia	BOL	24.236	36.9400	Lower middle income
28	Botswana	BWA	25.267	15.0000	Upper middle income
33	China	CHN	12.100	45.8000	Upper middle income
38	Comoros	COM	34.326	6.5000	Low income
43	Cyprus	CYP	11.436	65.4548	High income
48	Dominican Republic	DOM	21.198	45.9000	Upper middle income

In [53]:
```
stats[::-1]
```

Out[53]:

	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 [54]:
```
stats[::-2]
```

Out[54]:

	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 [56]:
```
stats[50:100]
```

Out[56]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
50	Ecuador	ECU	21.070	40.353684	Upper middle income
51	Egypt, Arab Rep.	EGY	28.032	29.400000	Lower middle income
52	Eritrea	ERI	34.800	0.900000	Low income
53	Spain	ESP	9.100	71.635000	High income
54	Estonia	EST	10.300	79.400000	High income
55	Ethiopia	ETH	32.925	1.900000	Low income
56	Finland	FIN	10.700	91.514400	High income
57	Fiji	FJI	20.463	37.100000	Upper middle income
58	France	FRA	12.300	81.919800	High income
59	Micronesia, Fed. Sts.	FSM	23.511	27.800000	Lower middle income
60	Gabon	GAB	30.555	9.200000	Upper middle income
61	United Kingdom	GBR	12.200	89.844100	High income
62	Georgia	GEO	13.332	43.300000	Lower middle income
63	Ghana	GHA	33.131	12.300000	Lower middle income
64	Guinea	GIN	37.337	1.600000	Low income
65	Gambia, The	GMB	42.525	14.000000	Low income
66	Guinea-Bissau	GNB	37.503	3.100000	Low income
67	Equatorial Guinea	GNQ	35.362	16.400000	High income
68	Greece	GRC	8.500	59.866300	High income
69	Grenada	GRD	19.334	35.000000	Upper middle income
70	Greenland	GRL	14.500	65.800000	High income
71	Guatemala	GTM	27.465	19.700000	Lower middle income
72	Guam	GUM	17.389	65.400000	High income
73	Guyana	GUY	18.885	35.000000	Lower middle income
74	Hong Kong SAR, China	HKG	7.900	74.200000	High income
75	Honduras	HND	21.593	17.800000	Lower middle income
76	Croatia	HRV	9.400	66.747600	High income
77	Haiti	HTI	25.345	10.600000	Low income
78	Hungary	HUN	9.200	72.643900	High income
79	Indonesia	IDN	20.297	14.940000	Lower middle income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
80	India	IND	20.291	15.100000	Lower middle income
81	Ireland	IRL	15.000	78.247700	High income
82	Iran, Islamic Rep.	IRN	17.900	29.950000	Upper middle income
83	Iraq	IRQ	31.093	9.200000	Upper middle income
84	Iceland	ISL	13.400	96.546800	High income
85	Israel	ISR	21.300	70.800000	High income
86	Italy	ITA	8.500	58.459300	High income
87	Jamaica	JAM	13.540	37.100000	Upper middle income
88	Jordan	JOR	27.046	41.000000	Upper middle income
89	Japan	JPN	8.200	89.710000	High income
90	Kazakhstan	KAZ	22.730	54.000000	Upper middle income
91	Kenya	KEN	35.194	39.000000	Lower middle income
92	Kyrgyz Republic	KGZ	27.200	23.000000	Lower middle income
93	Cambodia	KHM	24.462	6.800000	Low income
94	Kiribati	KIR	29.044	11.500000	Lower middle income
95	Korea, Rep.	KOR	8.600	84.770000	High income
96	Kuwait	KWT	20.575	75.460000	High income
97	Lao PDR	LAO	27.051	12.500000	Lower middle income
98	Lebanon	LBN	13.426	70.500000	Upper middle income
99	Liberia	LBR	35.521	3.200000	Low income

In [57]:
```
stats[0:200]
```

Out[57]:

	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 [58]:
```
stats
```

Out[58]:

	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 [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]: