In [28]:
```
#Lecture 1
import pandas as pd #for working with data frames
```

In [29]:
```
#Method 1:Specify all path to file
```

In [30]:
```
stats=pd.read_csv('G:\PYTHON\DataScienceWithPython\DemographicData.csv') #wher
e file is located
```

In [31]:
```
stats
```

Out[31]:

	Country Name	Country Code	Birth rate	Internet users	Income Group
0	Aruba	ABW	10.244	78.90000	High income
1	Afghanistan	AFG	35.253	5.90000	Low income
2	Angola	AGO	45.985	19.10000	Upper middle income
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
20	Belarus	BLR	12.500	54.17000	Upper middle income
21	Belize	BLZ	23.092	33.60000	Upper middle income
22	Bermuda	BMU	10.400	95.30000	High income
23	Bolivia	BOL	24.236	36.94000	Lower middle income

	Country Name	Country Code	Birth rate	Internet users	Income Group
24	Brazil	BRA	14.931	51.04000	Upper middle income
25	Barbados	BRB	12.188	73.00000	High income
26	Brunei Darussalam	BRN	16.405	64.50000	High income
27	Bhutan	BTN	18.134	29.90000	Lower middle income
28	Botswana	BWA	25.267	15.00000	Upper middle income
29	Central African Republic	CAF	34.076	3.50000	Low income
...	...	...	...	...	...
165	Seychelles	SYC	18.600	50.40000	High income
166	Syrian Arab Republic	SYR	24.043	26.20000	Lower middle income
167	Chad	TCD	45.745	2.30000	Low income
168	Togo	TGO	36.080	4.50000	Low income
169	Thailand	THA	11.041	28.94000	Upper middle income
170	Tajikistan	TJK	30.792	16.00000	Lower middle income
171	Turkmenistan	TKM	21.322	9.60000	Upper middle income
172	Timor-Leste	TLS	35.755	1.10000	Lower middle income
173	Tonga	TON	25.409	35.00000	Upper middle income
174	Trinidad and Tobago	TTO	14.590	63.80000	High income
175	Tunisia	TUN	19.800	43.80000	Upper middle income
176	Turkey	TUR	16.836	46.25000	Upper middle income
177	Tanzania	TZA	39.518	4.40000	Low income
178	Uganda	UGA	43.474	16.20000	Low income
179	Ukraine	UKR	11.100	41.00000	Lower middle income
180	Uruguay	URY	14.374	57.69000	High income

	Country Name	Country Code	Birth rate	Internet users	Income Group
181	United States	USA	12.500	84.20000	High income
182	Uzbekistan	UZB	22.500	38.20000	Lower middle income
183	St. Vincent and the Grenadines	VCT	16.306	52.00000	Upper middle income
184	Venezuela, RB	VEN	19.842	54.90000	High income
185	Virgin Islands (U.S.)	VIR	10.700	45.30000	High income
186	Vietnam	VNM	15.537	43.90000	Lower middle income
187	Vanuatu	VUT	26.739	11.30000	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.60000	Lower middle income
189	Samoa	WSM	26.172	15.30000	Lower middle income
190	Yemen, Rep.	YEM	32.947	20.00000	Lower middle income
191	South Africa	ZAF	20.850	46.50000	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.20000	Low income
193	Zambia	ZMB	40.471	15.40000	Lower middle income
194	Zimbabwe	ZWE	35.715	18.50000	Low income

195 rows × 5 columns

In [32]:
```
#Method 2:Change working Directory
```

In [33]:
```
import os
```

In [34]:
```
print(os.getcwd()) #tells the present working directory
```

```
G:\PYTHON\DataScienceWithPython
```

In [35]:
```
os.chdir('C:') #change the working directory
```

In [36]:
```
print(os.getcwd())
```

```
C:\
```

In [37]:
```
os.chdir('G:\PYTHON\DataScienceWithPython')
stats2=pd.read_csv('G:\PYTHON\DataScienceWithPython\DemographicData.csv')
```

In [38]:
```
stats2
```

Out[38]:

	Country Name	Country Code	Birth rate	Internet users	Income Group
0	Aruba	ABW	10.244	78.90000	High income
1	Afghanistan	AFG	35.253	5.90000	Low income
2	Angola	AGO	45.985	19.10000	Upper middle income
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
20	Belarus	BLR	12.500	54.17000	Upper middle income
21	Belize	BLZ	23.092	33.60000	Upper middle income
22	Bermuda	BMU	10.400	95.30000	High income
23	Bolivia	BOL	24.236	36.94000	Lower middle income

	Country Name	Country Code	Birth rate	Internet users	Income Group
24	Brazil	BRA	14.931	51.04000	Upper middle income
25	Barbados	BRB	12.188	73.00000	High income
26	Brunei Darussalam	BRN	16.405	64.50000	High income
27	Bhutan	BTN	18.134	29.90000	Lower middle income
28	Botswana	BWA	25.267	15.00000	Upper middle income
29	Central African Republic	CAF	34.076	3.50000	Low income
...	...	...	...	...	...
165	Seychelles	SYC	18.600	50.40000	High income
166	Syrian Arab Republic	SYR	24.043	26.20000	Lower middle income
167	Chad	TCD	45.745	2.30000	Low income
168	Togo	TGO	36.080	4.50000	Low income
169	Thailand	THA	11.041	28.94000	Upper middle income
170	Tajikistan	TJK	30.792	16.00000	Lower middle income
171	Turkmenistan	TKM	21.322	9.60000	Upper middle income
172	Timor-Leste	TLS	35.755	1.10000	Lower middle income
173	Tonga	TON	25.409	35.00000	Upper middle income
174	Trinidad and Tobago	TTO	14.590	63.80000	High income
175	Tunisia	TUN	19.800	43.80000	Upper middle income
176	Turkey	TUR	16.836	46.25000	Upper middle income
177	Tanzania	TZA	39.518	4.40000	Low income
178	Uganda	UGA	43.474	16.20000	Low income
179	Ukraine	UKR	11.100	41.00000	Lower middle income
180	Uruguay	URY	14.374	57.69000	High income

	Country Name	Country Code	Birth rate	Internet users	Income Group
181	United States	USA	12.500	84.20000	High income
182	Uzbekistan	UZB	22.500	38.20000	Lower middle income
183	St. Vincent and the Grenadines	VCT	16.306	52.00000	Upper middle income
184	Venezuela, RB	VEN	19.842	54.90000	High income
185	Virgin Islands (U.S.)	VIR	10.700	45.30000	High income
186	Vietnam	VNM	15.537	43.90000	Lower middle income
187	Vanuatu	VUT	26.739	11.30000	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.60000	Lower middle income
189	Samoa	WSM	26.172	15.30000	Lower middle income
190	Yemen, Rep.	YEM	32.947	20.00000	Lower middle income
191	South Africa	ZAF	20.850	46.50000	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.20000	Low income
193	Zambia	ZMB	40.471	15.40000	Lower middle income
194	Zimbabwe	ZWE	35.715	18.50000	Low income

195 rows × 5 columns

In [39]:
```
#Lecture 2
```

In [40]:
```
#Fulll data Frame
stats
```

Out[40]:

	Country Name	Country Code	Birth rate	Internet users	Income Group
0	Aruba	ABW	10.244	78.90000	High income
1	Afghanistan	AFG	35.253	5.90000	Low income
2	Angola	AGO	45.985	19.10000	Upper middle income
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
20	Belarus	BLR	12.500	54.17000	Upper middle income
21	Belize	BLZ	23.092	33.60000	Upper middle income
22	Bermuda	BMU	10.400	95.30000	High income
23	Bolivia	BOL	24.236	36.94000	Lower middle income

	Country Name	Country Code	Birth rate	Internet users	Income Group
24	Brazil	BRA	14.931	51.04000	Upper middle income
25	Barbados	BRB	12.188	73.00000	High income
26	Brunei Darussalam	BRN	16.405	64.50000	High income
27	Bhutan	BTN	18.134	29.90000	Lower middle income
28	Botswana	BWA	25.267	15.00000	Upper middle income
29	Central African Republic	CAF	34.076	3.50000	Low income
...	...	...	...	...	...
165	Seychelles	SYC	18.600	50.40000	High income
166	Syrian Arab Republic	SYR	24.043	26.20000	Lower middle income
167	Chad	TCD	45.745	2.30000	Low income
168	Togo	TGO	36.080	4.50000	Low income
169	Thailand	THA	11.041	28.94000	Upper middle income
170	Tajikistan	TJK	30.792	16.00000	Lower middle income
171	Turkmenistan	TKM	21.322	9.60000	Upper middle income
172	Timor-Leste	TLS	35.755	1.10000	Lower middle income
173	Tonga	TON	25.409	35.00000	Upper middle income
174	Trinidad and Tobago	TTO	14.590	63.80000	High income
175	Tunisia	TUN	19.800	43.80000	Upper middle income
176	Turkey	TUR	16.836	46.25000	Upper middle income
177	Tanzania	TZA	39.518	4.40000	Low income
178	Uganda	UGA	43.474	16.20000	Low income
179	Ukraine	UKR	11.100	41.00000	Lower middle income
180	Uruguay	URY	14.374	57.69000	High income

	Country Name	Country Code	Birth rate	Internet users	Income Group
181	United States	USA	12.500	84.20000	High income
182	Uzbekistan	UZB	22.500	38.20000	Lower middle income
183	St. Vincent and the Grenadines	VCT	16.306	52.00000	Upper middle income
184	Venezuela, RB	VEN	19.842	54.90000	High income
185	Virgin Islands (U.S.)	VIR	10.700	45.30000	High income
186	Vietnam	VNM	15.537	43.90000	Lower middle income
187	Vanuatu	VUT	26.739	11.30000	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.60000	Lower middle income
189	Samoa	WSM	26.172	15.30000	Lower middle income
190	Yemen, Rep.	YEM	32.947	20.00000	Lower middle income
191	South Africa	ZAF	20.850	46.50000	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.20000	Low income
193	Zambia	ZMB	40.471	15.40000	Lower middle income
194	Zimbabwe	ZWE	35.715	18.50000	Low income

195 rows × 5 columns

In [41]:
```
#Exploring no. of rows
len(stats)
```

Out[41]: 195

In [43]:
```
#Check Columns
stats.columns #table_name.columns
```

Out[43]:
```
Index(['Country Name', 'Country Code', 'Birth rate', 'Internet users',
       'Income Group'],
      dtype='object')
```

In [44]:
```
#Number of column
len(stats.columns)
```

Out[44]: 5

In [49]:
```
#Checking top rows
stats.head() #top 5
```

Out[49]:

	Country Name	Country Code	Birth rate	Internet users	Income Group
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 [50]:
```
stats.head(n=6) #specifying the number
```

Out[50]:

	Country Name	Country Code	Birth rate	Internet users	Income Group
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
5	Argentina	ARG	17.716	59.9	High income

In [51]:
```
#Checking bottom rows
stats.tail()
```

Out[51]:

	Country Name	Country Code	Birth rate	Internet users	Income Group
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 [52]:
```
stats.tail(n=10)
```

Out[52]:

	Country Name	Country Code	Birth rate	Internet users	Income Group
185	Virgin Islands (U.S.)	VIR	10.700	45.3	High income
186	Vietnam	VNM	15.537	43.9	Lower middle income
187	Vanuatu	VUT	26.739	11.3	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.6	Lower middle income
189	Samoa	WSM	26.172	15.3	Lower middle 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

In [53]:
```
#Information on column
stats.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 195 entries, 0 to 194
Data columns (total 5 columns):
Country Name      195 non-null object
Country Code      195 non-null object
Birth rate        195 non-null float64
Internet users    195 non-null float64
Income Group      195 non-null object
dtypes: float64(2), object(3)
memory usage: 7.7+ KB
```

In [54]:
```
#get stats of the column
stats.describe()
```

Out[54]:

	Birth rate	Internet users
count	195.000000	195.000000
mean	21.469928	42.076471
std	10.605467	29.030788
min	7.900000	0.900000
25%	12.120500	14.520000
50%	19.680000	41.000000
75%	29.759500	66.225000
max	49.661000	96.546800

In [55]:
```
stats.describe().transpose()
```

Out[55]:

	count	mean	std	min	25%	50%	75%	max
Birth rate	195.0	21.469928	10.605467	7.9	12.1205	19.68	29.7595	49.6610
Internet users	195.0	42.076471	29.030788	0.9	14.5200	41.00	66.2250	96.5468

In [56]:
```
#Lecture 3
```

In [57]:
```
stats.head()
```

Out[57]:

	Country Name	Country Code	Birth rate	Internet users	Income Group
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 [58]:
```
stats.columns
```

Out[58]:
```
Index(['Country Name', 'Country Code', 'Birth rate', 'Internet users',
       'Income Group'],
      dtype='object')
```

In [66]:
```
stats.columns=['a','b','c','d','e']
```

In [67]:
```
stats.columns
```

Out[67]:
```
Index(['a', 'b', 'c', 'd', 'e'], dtype='object')
```

In [75]:
```
stats.columns=['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers','Inc
omeGroup']
```

In [76]:
```
stats.columns
```

Out[76]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [77]:
```
stats.head()
```

Out[77]:

	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 [71]:
```
#Lecture 4
```

In [80]:
```
#Slicing Through Rows
```

In [81]:
```
stats[21:26]
```

Out[81]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
21	Belize	BLZ	23.092	33.60	Upper middle income
22	Bermuda	BMU	10.400	95.30	High income
23	Bolivia	BOL	24.236	36.94	Lower middle income
24	Brazil	BRA	14.931	51.04	Upper middle income
25	Barbados	BRB	12.188	73.00	High income

In [82]:
```
stats[:]
```

Out[82]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.90000	High income
1	Afghanistan	AFG	35.253	5.90000	Low income
2	Angola	AGO	45.985	19.10000	Upper middle income
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
20	Belarus	BLR	12.500	54.17000	Upper middle income
21	Belize	BLZ	23.092	33.60000	Upper middle income
22	Bermuda	BMU	10.400	95.30000	High income
23	Bolivia	BOL	24.236	36.94000	Lower middle income

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24	Brazil	BRA	14.931	51.04000	Upper middle income
25	Barbados	BRB	12.188	73.00000	High income
26	Brunei Darussalam	BRN	16.405	64.50000	High income
27	Bhutan	BTN	18.134	29.90000	Lower middle income
28	Botswana	BWA	25.267	15.00000	Upper middle income
29	Central African Republic	CAF	34.076	3.50000	Low income
...	...	...	...	...	...
165	Seychelles	SYC	18.600	50.40000	High income
166	Syrian Arab Republic	SYR	24.043	26.20000	Lower middle income
167	Chad	TCD	45.745	2.30000	Low income
168	Togo	TGO	36.080	4.50000	Low income
169	Thailand	THA	11.041	28.94000	Upper middle income
170	Tajikistan	TJK	30.792	16.00000	Lower middle income
171	Turkmenistan	TKM	21.322	9.60000	Upper middle income
172	Timor-Leste	TLS	35.755	1.10000	Lower middle income
173	Tonga	TON	25.409	35.00000	Upper middle income
174	Trinidad and Tobago	TTO	14.590	63.80000	High income
175	Tunisia	TUN	19.800	43.80000	Upper middle income
176	Turkey	TUR	16.836	46.25000	Upper middle income
177	Tanzania	TZA	39.518	4.40000	Low income
178	Uganda	UGA	43.474	16.20000	Low income
179	Ukraine	UKR	11.100	41.00000	Lower middle income
180	Uruguay	URY	14.374	57.69000	High income
181	United States	USA	12.500	84.20000	High income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
182	Uzbekistan	UZB	22.500	38.20000	Lower middle income
183	St. Vincent and the Grenadines	VCT	16.306	52.00000	Upper middle income
184	Venezuela, RB	VEN	19.842	54.90000	High income
185	Virgin Islands (U.S.)	VIR	10.700	45.30000	High income
186	Vietnam	VNM	15.537	43.90000	Lower middle income
187	Vanuatu	VUT	26.739	11.30000	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.60000	Lower middle income
189	Samoa	WSM	26.172	15.30000	Lower middle income
190	Yemen, Rep.	YEM	32.947	20.00000	Lower middle income
191	South Africa	ZAF	20.850	46.50000	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.20000	Low income
193	Zambia	ZMB	40.471	15.40000	Lower middle income
194	Zimbabwe	ZWE	35.715	18.50000	Low income

195 rows × 5 columns

In [83]:
```
stats[185:]
```

Out[83]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
185	Virgin Islands (U.S.)	VIR	10.700	45.3	High income
186	Vietnam	VNM	15.537	43.9	Lower middle income
187	Vanuatu	VUT	26.739	11.3	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.6	Lower middle income
189	Samoa	WSM	26.172	15.3	Lower middle 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

In [85]:
```
stats[:10] #stats.head(n=10)
```

Out[85]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9000	High income
1	Afghanistan	AFG	35.253	5.9000	Low income
2	Angola	AGO	45.985	19.1000	Upper middle income
3	Albania	ALB	12.877	57.2000	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0000	High income
5	Argentina	ARG	17.716	59.9000	High income
6	Armenia	ARM	13.308	41.9000	Lower middle income
7	Antigua and Barbuda	ATG	16.447	63.4000	High income
8	Australia	AUS	13.200	83.0000	High income
9	Austria	AUT	9.400	80.6188	High income

In [93]:
```
#Reversing the data frame
stats[::-1]
```

Out[93]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
194	Zimbabwe	ZWE	35.715	18.50000	Low income
193	Zambia	ZMB	40.471	15.40000	Lower middle income
192	Congo, Dem. Rep.	COD	42.394	2.20000	Low income
191	South Africa	ZAF	20.850	46.50000	Upper middle income
190	Yemen, Rep.	YEM	32.947	20.00000	Lower middle income
189	Samoa	WSM	26.172	15.30000	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.60000	Lower middle income
187	Vanuatu	VUT	26.739	11.30000	Lower middle income
186	Vietnam	VNM	15.537	43.90000	Lower middle income
185	Virgin Islands (U.S.)	VIR	10.700	45.30000	High income
184	Venezuela, RB	VEN	19.842	54.90000	High income
183	St. Vincent and the Grenadines	VCT	16.306	52.00000	Upper middle income
182	Uzbekistan	UZB	22.500	38.20000	Lower middle income
181	United States	USA	12.500	84.20000	High income
180	Uruguay	URY	14.374	57.69000	High income
179	Ukraine	UKR	11.100	41.00000	Lower middle income
178	Uganda	UGA	43.474	16.20000	Low income
177	Tanzania	TZA	39.518	4.40000	Low income
176	Turkey	TUR	16.836	46.25000	Upper middle income
175	Tunisia	TUN	19.800	43.80000	Upper middle income
174	Trinidad and Tobago	TTO	14.590	63.80000	High income
173	Tonga	TON	25.409	35.00000	Upper middle income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
172	Timor-Leste	TLS	35.755	1.10000	Lower middle income
171	Turkmenistan	TKM	21.322	9.60000	Upper middle income
170	Tajikistan	TJK	30.792	16.00000	Lower middle income
169	Thailand	THA	11.041	28.94000	Upper middle income
168	Togo	TGO	36.080	4.50000	Low income
167	Chad	TCD	45.745	2.30000	Low income
166	Syrian Arab Republic	SYR	24.043	26.20000	Lower middle income
165	Seychelles	SYC	18.600	50.40000	High income
...	...	...	...	...	...
29	Central African Republic	CAF	34.076	3.50000	Low income
28	Botswana	BWA	25.267	15.00000	Upper middle income
27	Bhutan	BTN	18.134	29.90000	Lower middle income
26	Brunei Darussalam	BRN	16.405	64.50000	High income
25	Barbados	BRB	12.188	73.00000	High income
24	Brazil	BRA	14.931	51.04000	Upper middle income
23	Bolivia	BOL	24.236	36.94000	Lower middle income
22	Bermuda	BMU	10.400	95.30000	High income
21	Belize	BLZ	23.092	33.60000	Upper middle income
20	Belarus	BLR	12.500	54.17000	Upper middle income
19	Bosnia and Herzegovina	BIH	9.062	57.79000	Upper middle income
18	Bahamas, The	BHS	15.339	72.00000	High income
17	Bahrain	BHR	15.040	90.00004	High income
16	Bulgaria	BGR	9.200	53.06150	Upper middle income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
15	Bangladesh	BGD	20.142	6.63000	Lower middle income
14	Burkina Faso	BFA	40.551	9.10000	Low income
13	Benin	BEN	36.440	4.90000	Low income
12	Belgium	BEL	11.200	82.17020	High income
11	Burundi	BDI	44.151	1.30000	Low income
10	Azerbaijan	AZE	18.300	58.70000	Upper middle income
9	Austria	AUT	9.400	80.61880	High income
8	Australia	AUS	13.200	83.00000	High income
7	Antigua and Barbuda	ATG	16.447	63.40000	High income
6	Armenia	ARM	13.308	41.90000	Lower middle income
5	Argentina	ARG	17.716	59.90000	High income
4	United Arab Emirates	ARE	11.044	88.00000	High income
3	Albania	ALB	12.877	57.20000	Upper middle income
2	Angola	AGO	45.985	19.10000	Upper middle income
1	Afghanistan	AFG	35.253	5.90000	Low income
0	Aruba	ABW	10.244	78.90000	High income

195 rows × 5 columns

In [94]:
```
#Getting every 20th row
stats[::20]
```

Out[94]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9000	High income
20	Belarus	BLR	12.500	54.1700	Upper middle income
40	Costa Rica	CRI	15.022	45.9600	Upper middle income
60	Gabon	GAB	30.555	9.2000	Upper middle income
80	India	IND	20.291	15.1000	Lower middle income
100	Libya	LBY	21.425	16.5000	Upper middle income
120	Mozambique	MOZ	39.705	5.4000	Low income
140	Poland	POL	9.600	62.8492	High income
160	Suriname	SUR	18.455	37.4000	Upper middle income
180	Uruguay	URY	14.374	57.6900	High income

In [95]:
```
#Slicing through columns
```

In [102]:
```
stats.head()
```

Out[102]:

	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 [98]:
```
stats['CountryName']
```

Out[98]:

0	Aruba
1	Afghanistan
2	Angola
3	Albania
4	United Arab Emirates
5	Argentina
6	Armenia
7	Antigua and Barbuda
8	Australia
9	Austria
10	Azerbaijan
11	Burundi
12	Belgium
13	Benin
14	Burkina Faso
15	Bangladesh
16	Bulgaria
17	Bahrain
18	Bahamas, The
19	Bosnia and Herzegovina
20	Belarus
21	Belize
22	Bermuda
23	Bolivia
24	Brazil
25	Barbados
26	Brunei Darussalam
27	Bhutan
28	Botswana
29	Central African Republic
...	...
165	Seychelles
166	Syrian Arab Republic
167	Chad
168	Togo
169	Thailand
170	Tajikistan
171	Turkmenistan
172	Timor-Leste
173	Tonga
174	Trinidad and Tobago
175	Tunisia
176	Turkey
177	Tanzania
178	Uganda
179	Ukraine
180	Uruguay
181	United States
182	Uzbekistan
183	St. Vincent and the Grenadines
184	Venezuela, RB
185	Virgin Islands (U.S.)
186	Vietnam
187	Vanuatu
188	West Bank and Gaza
189	Samoa
190	Yemen, Rep.

```
191                    South Africa
192                Congo, Dem. Rep.
193                          Zambia
194                        Zimbabwe
Name: CountryName, Length: 195, dtype: object
```

In [103]:
```
stats['CountryName'].head()
```

Out[103]:
```
0                  Aruba
1            Afghanistan
2                 Angola
3                Albania
4    United Arab Emirates
Name: CountryName, dtype: object
```

In [105]:
```
stats[['CountryName','BirthRate']].head() #double [] because arguements are pa
sses as list and they follow the order specified by the user
```

Out[105]:

	CountryName	BirthRate
0	Aruba	10.244
1	Afghanistan	35.253
2	Angola	45.985
3	Albania	12.877
4	United Arab Emirates	11.044

In [107]:
```
stats.BirthRate #quick access
```

```
Out[107]: 0      10.244
          1      35.253
          2      45.985
          3      12.877
          4      11.044
          5      17.716
          6      13.308
          7      16.447
          8      13.200
          9       9.400
          10     18.300
          11     44.151
          12     11.200
          13     36.440
          14     40.551
          15     20.142
          16      9.200
          17     15.040
          18     15.339
          19      9.062
          20     12.500
          21     23.092
          22     10.400
          23     24.236
          24     14.931
          25     12.188
          26     16.405
          27     18.134
          28     25.267
          29     34.076
                  ...
          165    18.600
          166    24.043
          167    45.745
          168    36.080
          169    11.041
          170    30.792
          171    21.322
          172    35.755
          173    25.409
          174    14.590
          175    19.800
          176    16.836
          177    39.518
          178    43.474
          179    11.100
          180    14.374
          181    12.500
          182    22.500
          183    16.306
          184    19.842
          185    10.700
          186    15.537
          187    26.739
          188    30.394
          189    26.172
          190    32.947
```

```
191    20.850
192    42.394
193    40.471
194    35.715
Name: BirthRate, Length: 195, dtype: float64
```

In [108]:
```
stats.BirthRate.head()
```

Out[108]:
```
0    10.244
1    35.253
2    45.985
3    12.877
4    11.044
Name: BirthRate, dtype: float64
```

In [109]:
```
#Combing the two techniques
```

In [111]:
```
stats[4:8][['CountryName','BirthRate']] #Silimar to matrix
```

Out[111]:

	CountryName	BirthRate
4	United Arab Emirates	11.044
5	Argentina	17.716
6	Armenia	13.308
7	Antigua and Barbuda	16.447

In [112]:
```
#Lecture 5
```

In [113]:
```
stats[4:8][['CountryName','BirthRate','InternetUsers']]
```

Out[113]:

	CountryName	BirthRate	InternetUsers
4	United Arab Emirates	11.044	88.0
5	Argentina	17.716	59.9
6	Armenia	13.308	41.9
7	Antigua and Barbuda	16.447	63.4

In [114]:
```
#Mathematical Operations(+,-,*,/)
result=stats.BirthRate*stats.InternetUsers
```

In [116]:
```
result[4:8]
```

Out[116]:
```
4     971.8720
5    1061.1884
6     557.6052
7    1042.7398
dtype: float64
```

In [117]:
```
#Adding a new column
```

In [120]:
```
stats['MyCalc']=stats.BirthRate*stats.InternetUsers
stats[4:8]
```

Out[120]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyCalc
4	United Arab Emirates	ARE	11.044	88.0	High income	971.8720
5	Argentina	ARG	17.716	59.9	High income	1061.1884
6	Armenia	ARM	13.308	41.9	Lower middle income	557.6052
7	Antigua and Barbuda	ATG	16.447	63.4	High income	1042.7398

In [122]:
```
#Removing a column
stats.drop('MyCalc',1)
```

Out[122]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.90000	High income
1	Afghanistan	AFG	35.253	5.90000	Low income
2	Angola	AGO	45.985	19.10000	Upper middle income
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
20	Belarus	BLR	12.500	54.17000	Upper middle income
21	Belize	BLZ	23.092	33.60000	Upper middle income
22	Bermuda	BMU	10.400	95.30000	High income
23	Bolivia	BOL	24.236	36.94000	Lower middle income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
24	Brazil	BRA	14.931	51.04000	Upper middle income
25	Barbados	BRB	12.188	73.00000	High income
26	Brunei Darussalam	BRN	16.405	64.50000	High income
27	Bhutan	BTN	18.134	29.90000	Lower middle income
28	Botswana	BWA	25.267	15.00000	Upper middle income
29	Central African Republic	CAF	34.076	3.50000	Low income
...	...	...	...	...	...
165	Seychelles	SYC	18.600	50.40000	High income
166	Syrian Arab Republic	SYR	24.043	26.20000	Lower middle income
167	Chad	TCD	45.745	2.30000	Low income
168	Togo	TGO	36.080	4.50000	Low income
169	Thailand	THA	11.041	28.94000	Upper middle income
170	Tajikistan	TJK	30.792	16.00000	Lower middle income
171	Turkmenistan	TKM	21.322	9.60000	Upper middle income
172	Timor-Leste	TLS	35.755	1.10000	Lower middle income
173	Tonga	TON	25.409	35.00000	Upper middle income
174	Trinidad and Tobago	TTO	14.590	63.80000	High income
175	Tunisia	TUN	19.800	43.80000	Upper middle income
176	Turkey	TUR	16.836	46.25000	Upper middle income
177	Tanzania	TZA	39.518	4.40000	Low income
178	Uganda	UGA	43.474	16.20000	Low income
179	Ukraine	UKR	11.100	41.00000	Lower middle income
180	Uruguay	URY	14.374	57.69000	High income
181	United States	USA	12.500	84.20000	High income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
182	Uzbekistan	UZB	22.500	38.20000	Lower middle income
183	St. Vincent and the Grenadines	VCT	16.306	52.00000	Upper middle income
184	Venezuela, RB	VEN	19.842	54.90000	High income
185	Virgin Islands (U.S.)	VIR	10.700	45.30000	High income
186	Vietnam	VNM	15.537	43.90000	Lower middle income
187	Vanuatu	VUT	26.739	11.30000	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.60000	Lower middle income
189	Samoa	WSM	26.172	15.30000	Lower middle income
190	Yemen, Rep.	YEM	32.947	20.00000	Lower middle income
191	South Africa	ZAF	20.850	46.50000	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.20000	Low income
193	Zambia	ZMB	40.471	15.40000	Lower middle income
194	Zimbabwe	ZWE	35.715	18.50000	Low income

195 rows × 5 columns

In [124]:
```
stats.head() #still here because it prints the operation instead of modifying
```

Out[124]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyCalc
0	Aruba	ABW	10.244	78.9	High income	808.2516
1	Afghanistan	AFG	35.253	5.9	Low income	207.9927
2	Angola	AGO	45.985	19.1	Upper middle income	878.3135
3	Albania	ALB	12.877	57.2	Upper middle income	736.5644
4	United Arab Emirates	ARE	11.044	88.0	High income	971.8720

In [125]:
```
stats=stats.drop('MyCalc',1)
```

In [128]:
```
stats.head()#Now it itsn`t there because we have stored it`s value
```

Out[128]:

	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 [129]:
```
#Lecture 6
```

In [130]:
```
#Filtering data Frames
```

In [131]:
```
#Filtering is all about rows
```

In [132]:
```
stats.head()
```

Out[132]:

	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 [133]:
```
stats.InternetUsers<2
```

```
Out[133]: 0      False
          1      False
          2      False
          3      False
          4      False
          5      False
          6      False
          7      False
          8      False
          9      False
          10     False
          11      True
          12     False
          13     False
          14     False
          15     False
          16     False
          17     False
          18     False
          19     False
          20     False
          21     False
          22     False
          23     False
          24     False
          25     False
          26     False
          27     False
          28     False
          29     False
                 ...
          165    False
          166    False
          167    False
          168    False
          169    False
          170    False
          171    False
          172     True
          173    False
          174    False
          175    False
          176    False
          177    False
          178    False
          179    False
          180    False
          181    False
          182    False
          183    False
          184    False
          185    False
          186    False
          187    False
          188    False
          189    False
          190    False
```

```
191    False
192    False
193    False
194    False
Name: InternetUsers, Length: 195, dtype: bool
```

In [134]:
```
Filter = stats.InternetUsers<2
```

In [135]:
```
Filter
```

```
Out[135]: 0      False
          1      False
          2      False
          3      False
          4      False
          5      False
          6      False
          7      False
          8      False
          9      False
          10     False
          11      True
          12     False
          13     False
          14     False
          15     False
          16     False
          17     False
          18     False
          19     False
          20     False
          21     False
          22     False
          23     False
          24     False
          25     False
          26     False
          27     False
          28     False
          29     False
                 ...
          165    False
          166    False
          167    False
          168    False
          169    False
          170    False
          171    False
          172     True
          173    False
          174    False
          175    False
          176    False
          177    False
          178    False
          179    False
          180    False
          181    False
          182    False
          183    False
          184    False
          185    False
          186    False
          187    False
          188    False
          189    False
          190    False
```

```
191    False
192    False
193    False
194    False
Name: InternetUsers, Length: 195, dtype: bool
```

In [137]:
```
stats[Filter] #It took those values which were True
```

Out[137]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
11	Burundi	BDI	44.151	1.3	Low income
52	Eritrea	ERI	34.800	0.9	Low income
55	Ethiopia	ETH	32.925	1.9	Low income
64	Guinea	GIN	37.337	1.6	Low income
117	Myanmar	MMR	18.119	1.6	Lower middle income
127	Niger	NER	49.661	1.7	Low income
154	Sierra Leone	SLE	36.729	1.7	Low income
156	Somalia	SOM	43.891	1.5	Low income
172	Timor-Leste	TLS	35.755	1.1	Lower middle income

In [139]:
```
Filter2=stats.BirthRate>40
```

In [144]:
```
stats[Filter2]
```

Out[144]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
2	Angola	AGO	45.985	19.1	Upper middle income
11	Burundi	BDI	44.151	1.3	Low income
14	Burkina Faso	BFA	40.551	9.1	Low income
65	Gambia, The	GMB	42.525	14.0	Low income
115	Mali	MLI	44.138	3.5	Low income
127	Niger	NER	49.661	1.7	Low income
128	Nigeria	NGA	40.045	38.0	Lower middle income
156	Somalia	SOM	43.891	1.5	Low income
167	Chad	TCD	45.745	2.3	Low income
178	Uganda	UGA	43.474	16.2	Low income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income

In [155]:
```
stats[Filter][Filter2] #Using Two filters together
```

```
G:\PYTHON\AnacondaPython\lib\site-packages\ipykernel_launcher.py:1: UserWarni
ng: Boolean Series key will be reindexed to match DataFrame index.
  """Entry point for launching an IPython kernel.
```

Out[155]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
11	Burundi	BDI	44.151	1.3	Low income
127	Niger	NER	49.661	1.7	Low income
156	Somalia	SOM	43.891	1.5	Low income

In [154]:
```
Filter and Filter2 #Error because we are not combing two single values
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-154-384bc50f9ca7> in <module>()
----> 1 Filter and Filter2 #Error because we are not combing two single value
s

G:\PYTHON\AnacondaPython\lib\site-packages\pandas\core\generic.py in __nonzer
o__(self)
    953         raise ValueError("The truth value of a {0} is ambiguous. "
    954                          "Use a.empty, a.bool(), a.item(), a.any() or
 a.all()."
--> 955                          .format(self.__class__.__name__))
    956
    957     __bool__ = __nonzero__

ValueError: The truth value of a Series is ambiguous. Use a.empty, a.bool(),
 a.item(), a.any() or a.all().
```

In [156]:
```
Filter & Filter2
```

```
Out[156]: 0      False
          1      False
          2      False
          3      False
          4      False
          5      False
          6      False
          7      False
          8      False
          9      False
          10     False
          11      True
          12     False
          13     False
          14     False
          15     False
          16     False
          17     False
          18     False
          19     False
          20     False
          21     False
          22     False
          23     False
          24     False
          25     False
          26     False
          27     False
          28     False
          29     False
                 ...
          165    False
          166    False
          167    False
          168    False
          169    False
          170    False
          171    False
          172    False
          173    False
          174    False
          175    False
          176    False
          177    False
          178    False
          179    False
          180    False
          181    False
          182    False
          183    False
          184    False
          185    False
          186    False
          187    False
          188    False
          189    False
          190    False
```

```
191    False
192    False
193    False
194    False
Length: 195, dtype: bool
```

In [158]:
```
stats[Filter & Filter2] #Similar to above one
```

Out[158]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
11	Burundi	BDI	44.151	1.3	Low income
127	Niger	NER	49.661	1.7	Low income
156	Somalia	SOM	43.891	1.5	Low income

In [160]:
```
stats[stats.IncomeGroup=='High income']
```

Out[160]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.90000	High income
4	United Arab Emirates	ARE	11.044	88.00000	High income
5	Argentina	ARG	17.716	59.90000	High 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
12	Belgium	BEL	11.200	82.17020	High income
17	Bahrain	BHR	15.040	90.00004	High income
18	Bahamas, The	BHS	15.339	72.00000	High income
22	Bermuda	BMU	10.400	95.30000	High income
25	Barbados	BRB	12.188	73.00000	High income
26	Brunei Darussalam	BRN	16.405	64.50000	High income
30	Canada	CAN	10.900	85.80000	High income
31	Switzerland	CHE	10.200	86.34000	High income
32	Chile	CHL	13.385	66.50000	High income
42	Cayman Islands	CYM	12.500	74.10000	High income
43	Cyprus	CYP	11.436	65.45480	High income
44	Czech Republic	CZE	10.200	74.11040	High income
45	Germany	DEU	8.500	84.17000	High income
47	Denmark	DNK	10.000	94.62970	High income
53	Spain	ESP	9.100	71.63500	High income
54	Estonia	EST	10.300	79.40000	High income
56	Finland	FIN	10.700	91.51440	High income
58	France	FRA	12.300	81.91980	High income
61	United Kingdom	GBR	12.200	89.84410	High income
67	Equatorial Guinea	GNQ	35.362	16.40000	High income
68	Greece	GRC	8.500	59.86630	High income
70	Greenland	GRL	14.500	65.80000	High income
72	Guam	GUM	17.389	65.40000	High income
74	Hong Kong SAR, China	HKG	7.900	74.20000	High income
...	...	...	...	...	...
95	Korea, Rep.	KOR	8.600	84.77000	High income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
96	Kuwait	KWT	20.575	75.46000	High income
102	Liechtenstein	LIE	9.200	93.80000	High income
105	Lithuania	LTU	10.100	68.45290	High income
106	Luxembourg	LUX	11.300	93.77650	High income
107	Latvia	LVA	10.200	75.23440	High income
108	Macao SAR, China	MAC	11.256	65.80000	High income
116	Malta	MLT	9.500	68.91380	High income
126	New Caledonia	NCL	17.000	66.00000	High income
130	Netherlands	NLD	10.200	93.95640	High income
131	Norway	NOR	11.600	95.05340	High income
133	New Zealand	NZL	13.120	82.78000	High income
134	Oman	OMN	20.419	66.45000	High income
140	Poland	POL	9.600	62.84920	High income
141	Puerto Rico	PRI	10.800	73.90000	High income
142	Portugal	PRT	7.900	62.09560	High income
144	French Polynesia	PYF	16.393	56.80000	High income
145	Qatar	QAT	11.940	85.30000	High income
147	Russian Federation	RUS	13.200	67.97000	High income
149	Saudi Arabia	SAU	20.576	60.50000	High income
152	Singapore	SGP	9.300	81.00000	High income
161	Slovak Republic	SVK	10.100	77.88260	High income
162	Slovenia	SVN	10.200	72.67560	High income
163	Sweden	SWE	11.800	94.78360	High income
165	Seychelles	SYC	18.600	50.40000	High income
174	Trinidad and Tobago	TTO	14.590	63.80000	High income
180	Uruguay	URY	14.374	57.69000	High income
181	United States	USA	12.500	84.20000	High income
184	Venezuela, RB	VEN	19.842	54.90000	High income
185	Virgin Islands (U.S.)	VIR	10.700	45.30000	High income

67 rows × 5 columns

In [161]:
```
#How to get unique category
stats.IncomeGroup.unique()
```

Out[161]:
```
array(['High income', 'Low income', 'Upper middle income',
       'Lower middle income'], dtype=object)
```

In [163]:
```
stats[stats.CountryName=='Malta'] #EXCERCISE
```

Out[163]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
116	Malta	MLT	9.5	68.9138	High income

In [164]:
```
#Lecture 7
```

In [165]:
```
#Accessing Individual Element
```

In [166]:
```
stats.head()
```

Out[166]:

	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 [167]:
```
#.at-for labels.Even integers are used as labels
#.iat-for integer location
```

In [168]:
```
stats.iat[3,4]
```

Out[168]:
```
'Upper middle income'
```

In [169]:
```
stats.iat[0,1]
```

Out[169]:
```
'ABW'
```

In [172]:
```
stats.at[0,'BirthRate']
```

Out[172]:
```
10.244000000000002
```

In [173]:
```
stats.at[3,'BirthRate']
```

Out[173]:
```
12.877000000000001
```

In [174]:
```
#why we need .at()-
sub10=stats[::10]
```

In [175]:
```
sub10
```

Out[175]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.900000	High income
10	Azerbaijan	AZE	18.300	58.700000	Upper middle income
20	Belarus	BLR	12.500	54.170000	Upper middle income
30	Canada	CAN	10.900	85.800000	High income
40	Costa Rica	CRI	15.022	45.960000	Upper middle income
50	Ecuador	ECU	21.070	40.353684	Upper middle income
60	Gabon	GAB	30.555	9.200000	Upper middle income
70	Greenland	GRL	14.500	65.800000	High income
80	India	IND	20.291	15.100000	Lower middle income
90	Kazakhstan	KAZ	22.730	54.000000	Upper middle income
100	Libya	LBY	21.425	16.500000	Upper middle income
110	Moldova	MDA	12.141	45.000000	Lower middle income
120	Mozambique	MOZ	39.705	5.400000	Low income
130	Netherlands	NLD	10.200	93.956400	High income
140	Poland	POL	9.600	62.849200	High income
150	Sudan	SDN	33.477	22.700000	Lower middle income
160	Suriname	SUR	18.455	37.400000	Upper middle income
170	Tajikistan	TJK	30.792	16.000000	Lower middle income
180	Uruguay	URY	14.374	57.690000	High income
190	Yemen, Rep.	YEM	32.947	20.000000	Lower middle income

In [176]:
```
sub10.iat[10,0] #iat counts physically
```

Out[176]:
```
'Libya'
```

In [178]:
```
sub10.at[10,'CountryName'] #It looks for label
```

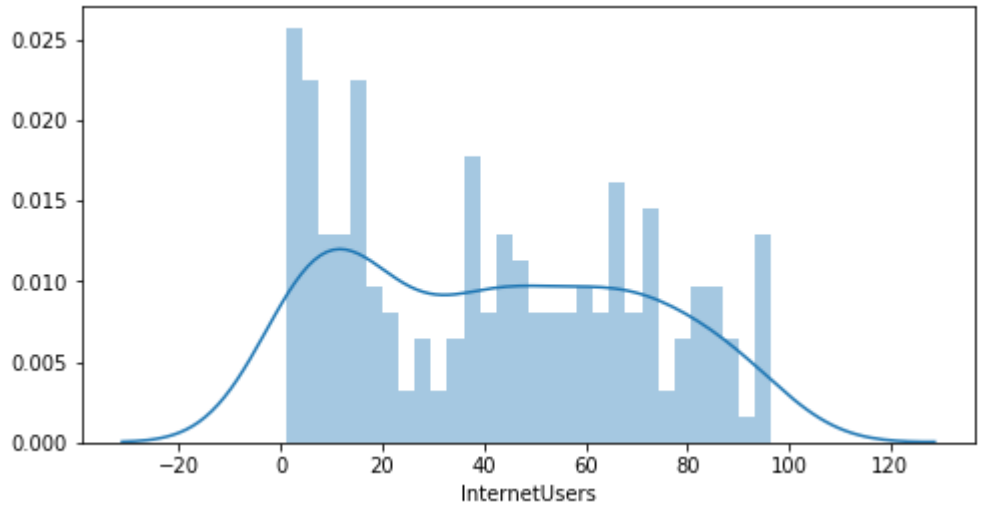
Out[178]:
```
'Azerbaijan'
```

In [179]:
```
#Lecture 8
```

In [180]:
```
#Introduction to Seaborn
import matplotlib.pyplot as plt
```

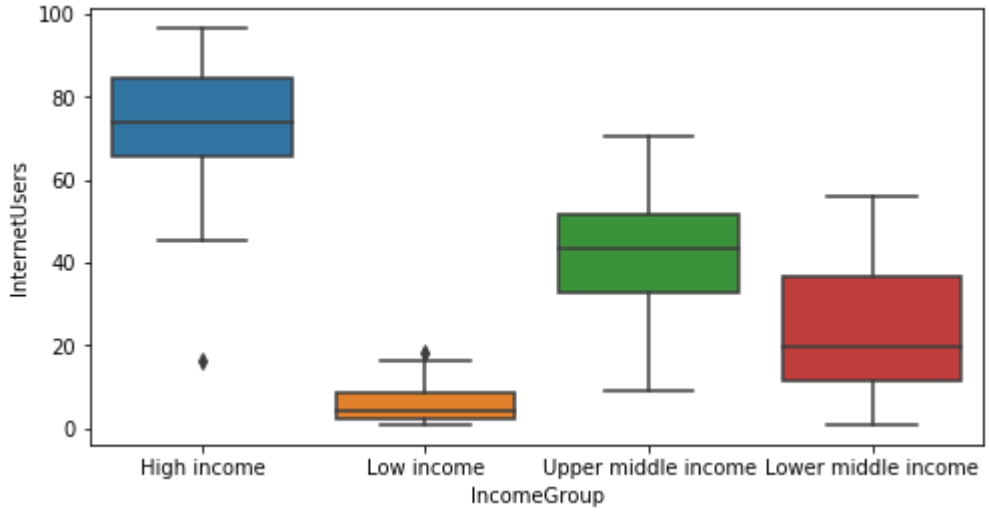
In [184]:
```
import seaborn as sns
%matplotlib inline
plt.rcParams['figure.figsize']=8,4
```

In [191]:
```
#Distribution:
vis1=sns.distplot(stats['InternetUsers'],bins=30)
```

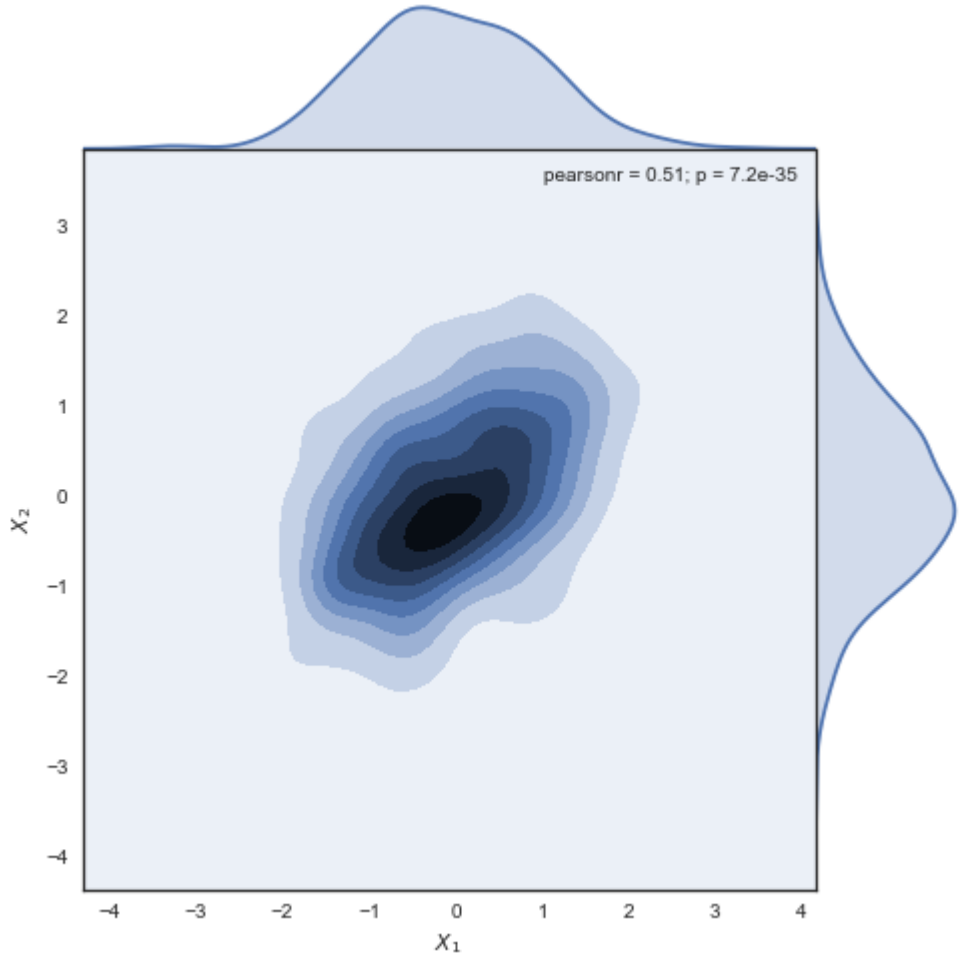


In [192]:
```
import warnings
warnings.filterwarnings('ignore')
```

In [193]:
```
#Boxplots
vis2=sns.boxplot(data=stats,x='IncomeGroup',y='InternetUsers')
```

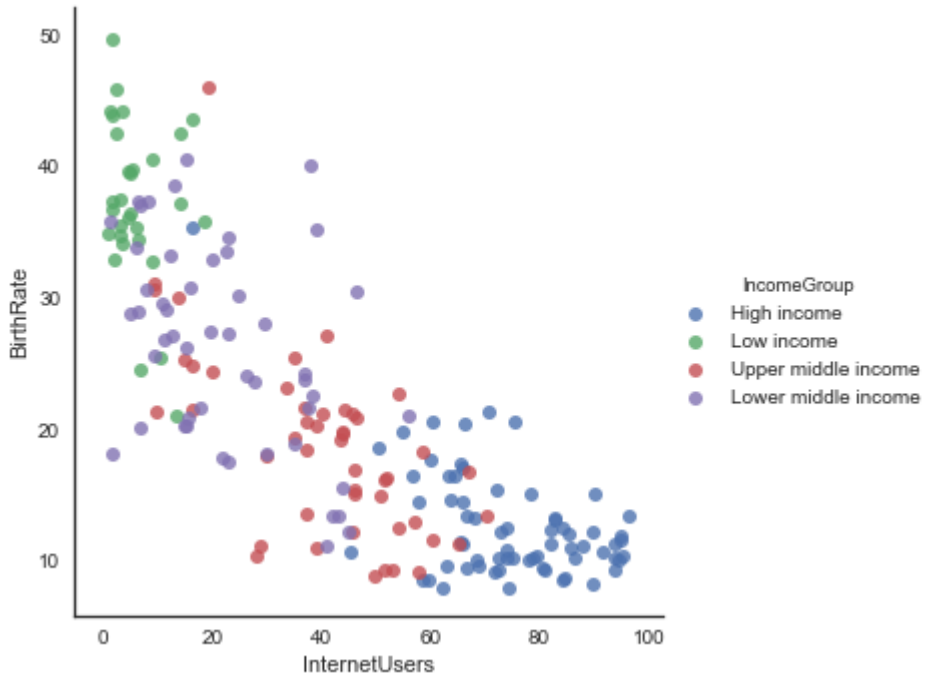


In [194]:
```
#GAllery
import numpy as np
import pandas as pd
import seaborn as sns
sns.set(style="white")

# Generate a random correlated bivariate dataset
rs = np.random.RandomState(5)
mean = [0, 0]
cov = [(1, .5), (.5, 1)]
x1, x2 = rs.multivariate_normal(mean, cov, 500).T
x1 = pd.Series(x1, name="$X_1$")
x2 = pd.Series(x2, name="$X_2$")

# Show the joint distribution using kernel density estimation
g = sns.jointplot(x1, x2, kind="kde", size=7, space=0)
```



In [196]:
```
#Lecture 9
```

In [199]:
```
vis3=sns.lmplot(data=stats,x='InternetUsers',y='BirthRate',fit_reg=False,hue=
'IncomeGroup')
```



In [200]:
```
#Lecture 10
```

In [201]:
```
#Keyword Tutorial
```

In [204]:
```
#MArker size
vis3=sns.lmplot(data=stats,x='InternetUsers',y='BirthRate',fit_reg=False,hue=
'IncomeGroup',scatter_kws={"s":100})
```