

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

import seaborn as sns
```

```
In [2]: pip install pandas
```

```
Requirement already satisfied: pandas in c:\users\asus\anaconda3\lib\site-packages (2.2.3)
Requirement already satisfied: numpy>=1.26.0 in c:\users\asus\anaconda3\lib\site-packages (from pandas) (2.1.3)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\asus\anaconda3\lib\site-packages (from pandas) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in c:\users\asus\anaconda3\lib\site-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in c:\users\asus\anaconda3\lib\site-packages (from pandas) (2025.2)
Requirement already satisfied: six>=1.5 in c:\users\asus\anaconda3\lib\site-packages (from python-dateutil>=2.8.2->pandas) (1.17.0)
Note: you may need to restart the kernel to use updated packages.
```

```
In [3]: stats = pd.read_excel(r'C:\6 Month Full Stack Data Science Course\data.xlsx')
```

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

```
Out[4]:
```

	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 [5]: len(stats)
```

```
Out[5]: 195
```

```
In [7]: stats.columns
```

```
Out[7]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
               'IncomeGroup'],
              dtype='object')
```

```
In [8]: len(stats.columns)
```

```
Out[8]: 5
```

```
In [15]: stats.shape
```

```
Out[15]: (195, 5)
```

```
In [9]: stats.isnull()
```

```
Out[9]:
```

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

Out[10]:

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

Out[11]:

In [12]: `stats.dtypes`

Out[12]:

In [13]: `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 [14]: `type(stats)`

Out[14]: `pandas.core.frame.DataFrame`

In [15]: `stats.head()`

Out[15]:

	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 [16]: `stats.tail()`

Out[16]:

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

Out[17]:

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

In [18]: `stats.tail(2)`

Out[18]:

	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 [19]: stats

Out[19]:

	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 [20]: stats.columns

Out[20]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers', 'IncomeGroup'],
dtype='object')

In [21]: stats['CountryName']

Out[21]: 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 [22]: stats[['BirthRate', 'InternetUsers']]

Out[22]:

	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

lets split the dataset to numeric & categoric

In [23]: `stats.columns`Out[23]: `Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers', 'IncomeGroup'], dtype='object')`In [48]: `stats.columns`Out[48]: `Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers', 'IncomeGroup'], dtype='object')`In [49]: `stats_numeric_data_ = stats[['BirthRate' , 'InternetUsers']]`In [50]: `stats_numeric_data_.head()`

Out[50]:

	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

In [51]:

```
stats_categorical_data = stats[['CountryName', 'CountryCode', 'IncomeGroup']]
```

In [52]:

```
stats_categorical_data
```

Out[52]:

	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 [53]:

```
stats_categorical_data.head
```

```
Out[53]: <bound method NDFrame.head of
eGroup
   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 x 3 columns]>
```

```
In [54]: print(stats.shape)
print(stats_numeric_data_.shape)
print(stats_categorical_data_.shape)

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

Slicing in Pandas

```
In [55]: stats
```

	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 [56]: stats[:]
```

Out[56]:

	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 [57]: stats[:3]

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

In [58]: stats[3:]

Out[58]:

	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 [59]: stats[3:10]

Out[59]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
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 [60]: stats[3:50:5]

Out[60]:

	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 [61]: stats[:::-2]

Out[61]:

	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 [62]: stats

Out[62]:

	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 [63]: stats[0:200]

Out[63]:

	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 [64]: stats.describe() # only numerical data not categorical data

Out[64]:

	BirthRate	InternetUsers
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 [65]: `stats.describe().transpose() # rows to column`

Out[65]:

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

In [66]: `stats_numeric_data_.describe().transpose()`

Out[66]:

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

In [67]: `stats_categorical_data_.describe()`

Out[67]:

	CountryName	CountryCode	IncomeGroup
count	195	195	195
unique	195	195	4
top	Aruba	ABW	High income
freq	1	1	67

In [68]: `stats.head()`

Out[68]:

	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 [76]: `stats['mycalc'] = stats['BirthRate'] * stats['InternetUsers'] # add new columns`In [70]: `stats`

Out[70]:

	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
...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income	658.9400
191	South Africa	ZAF	20.850	46.5	Upper middle income	969.5250
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income	93.2668
193	Zambia	ZMB	40.471	15.4	Lower middle income	623.2534
194	Zimbabwe	ZWE	35.715	18.5	Low income	660.7275

195 rows × 6 columns

In [71]: `stats.head(2)`

Out[71]:

	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

```
In [72]: stats.columns
```

```
Out[72]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup', 'mycalc'],
      dtype='object')
```

```
In [73]: len(stats.columns)
```

```
Out[73]: 6
```

```
In [74]: stats = stats.drop('mycalc',axis=1) # drop columns means remove
```

```
In [75]: stats
```

	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 [77]: stats[stats['InternetUsers'] < 2] # Less than
```

Out[77]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	mycalc
11	Burundi	BDI	44.151	1.3	Low income	57.3963
52	Eritrea	ERI	34.800	0.9	Low income	31.3200
55	Ethiopia	ETH	32.925	1.9	Low income	62.5575
64	Guinea	GIN	37.337	1.6	Low income	59.7392
117	Myanmar	MMR	18.119	1.6	Lower middle income	28.9904
127	Niger	NER	49.661	1.7	Low income	84.4237
154	Sierra Leone	SLE	36.729	1.7	Low income	62.4393
156	Somalia	SOM	43.891	1.5	Low income	65.8365
172	Timor-Leste	TLS	35.755	1.1	Lower middle income	39.3305

In [78]: stats[stats['InternetUsers'] > 2] # greaterthan

Out[78]:

	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
...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income	658.9400
191	South Africa	ZAF	20.850	46.5	Upper middle income	969.5250
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income	93.2668
193	Zambia	ZMB	40.471	15.4	Lower middle income	623.2534
194	Zimbabwe	ZWE	35.715	18.5	Low income	660.7275

186 rows × 6 columns

In [79]: `stats[stats['BirthRate'] > 40] # greaterthan`

Out[79]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	mycalc
2	Angola	AGO	45.985	19.1	Upper middle income	878.3135
11	Burundi	BDI	44.151	1.3	Low income	57.3963
14	Burkina Faso	BFA	40.551	9.1	Low income	369.0141
65	Gambia, The	GMB	42.525	14.0	Low income	595.3500
115	Mali	MLI	44.138	3.5	Low income	154.4830
127	Niger	NER	49.661	1.7	Low income	84.4237
128	Nigeria	NGA	40.045	38.0	Lower middle income	1521.7100
156	Somalia	SOM	43.891	1.5	Low income	65.8365
167	Chad	TCD	45.745	2.3	Low income	105.2135
178	Uganda	UGA	43.474	16.2	Low income	704.2788
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income	93.2668
193	Zambia	ZMB	40.471	15.4	Lower middle income	623.2534

In [82]: `len(stats[stats['BirthRate'] > 40])`

Out[82]: 12

In [84]: `stats[(stats.InternetUsers < 2) & (stats.BirthRate > 40)] # and operator`

Out[84]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	mycalc
11	Burundi	BDI	44.151	1.3	Low income	57.3963
127	Niger	NER	49.661	1.7	Low income	84.4237
156	Somalia	SOM	43.891	1.5	Low income	65.8365

In [87]: `stats`

Out[87]:

	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
...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income	658.9400
191	South Africa	ZAF	20.850	46.5	Upper middle income	969.5250
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income	93.2668
193	Zambia	ZMB	40.471	15.4	Lower middle income	623.2534
194	Zimbabwe	ZWE	35.715	18.5	Low income	660.7275

195 rows × 6 columns

In [88]:

```
stats[stats.IncomeGroup == 'Low income'] # equal op
```

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	mycalc
1	Afghanistan	AFG	35.253	5.90	Low income	207.99270
11	Burundi	BDI	44.151	1.30	Low income	57.39630
13	Benin	BEN	36.440	4.90	Low income	178.55600
14	Burkina Faso	BFA	40.551	9.10	Low income	369.01410
29	Central African Republic	CAF	34.076	3.50	Low income	119.26600
38	Comoros	COM	34.326	6.50	Low income	223.11900
52	Eritrea	ERI	34.800	0.90	Low income	31.32000
55	Ethiopia	ETH	32.925	1.90	Low income	62.55750
64	Guinea	GIN	37.337	1.60	Low income	59.73920
65	Gambia, The	GMB	42.525	14.00	Low income	595.35000
66	Guinea-Bissau	GNB	37.503	3.10	Low income	116.25930
77	Haiti	HTI	25.345	10.60	Low income	268.65700
93	Cambodia	KHM	24.462	6.80	Low income	166.34160
99	Liberia	LBR	35.521	3.20	Low income	113.66720
111	Madagascar	MDG	34.686	3.00	Low income	104.05800
115	Mali	MLI	44.138	3.50	Low income	154.48300
120	Mozambique	MOZ	39.705	5.40	Low income	214.40700
123	Malawi	MWI	39.459	5.05	Low income	199.26795
127	Niger	NER	49.661	1.70	Low income	84.42370
132	Nepal	NPL	20.923	13.30	Low income	278.27590
148	Rwanda	RWA	32.689	9.00	Low income	294.20100
154	Sierra Leone	SLE	36.729	1.70	Low income	62.43930
156	Somalia	SOM	43.891	1.50	Low income	65.83650
158	South Sudan	SSD	37.126	14.10	Low income	523.47660
167	Chad	TCD	45.745	2.30	Low income	105.21350
168	Togo	TGO	36.080	4.50	Low income	162.36000
177	Tanzania	TZA	39.518	4.40	Low income	173.87920
178	Uganda	UGA	43.474	16.20	Low income	704.27880
192	Congo, Dem. Rep.	COD	42.394	2.20	Low income	93.26680

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	mycalc
194	Zimbabwe	ZWE	35.715	18.50	Low income	660.72750

In [91]: `stats.IncomeGroup.unique()`

Out[91]: `array(['High income', 'Low income', 'Upper middle income', 'Lower middle income'], dtype=object)`

In [92]: `stats.IncomeGroup.nunique()`

Out[92]: 4

```
In [93]: import matplotlib.pyplot as plt
import seaborn as sns

%matplotlib inline
plt.rcParams['figure.figsize'] = 6,2 # size
import warnings
warnings.filterwarnings('ignore')
```

In [95]: `stats`

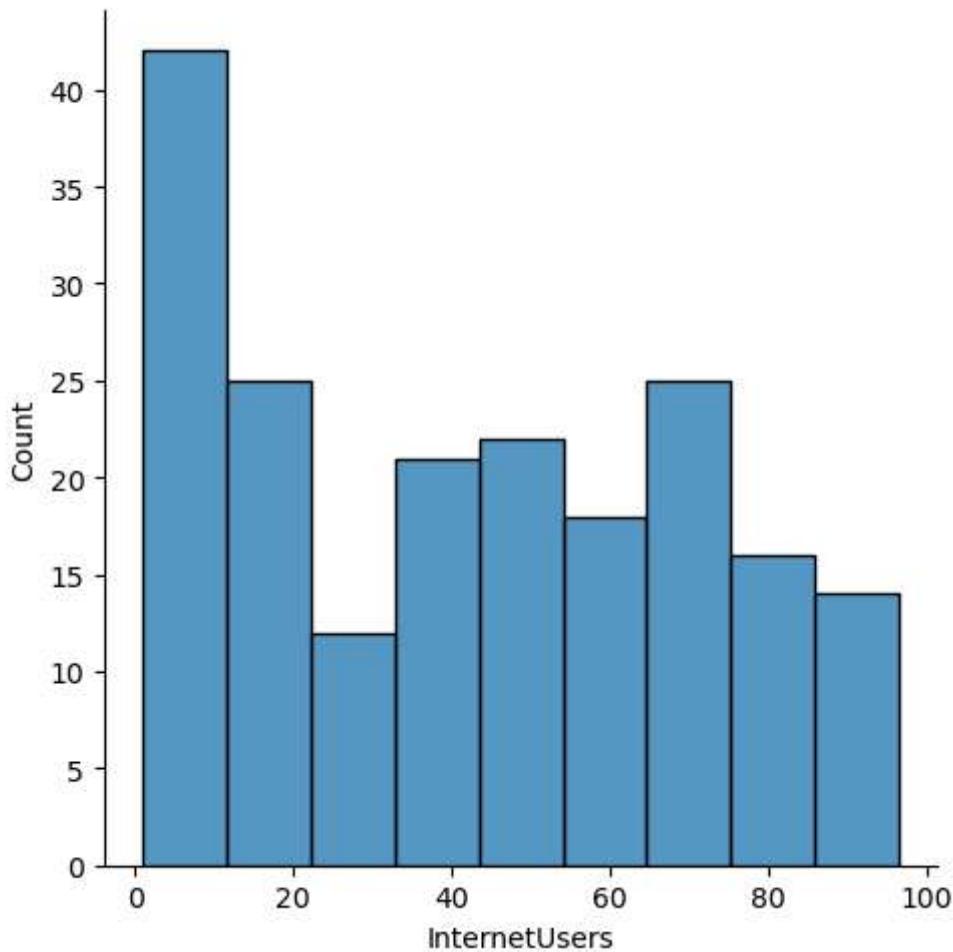
	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	mycalc
0	Aruba	ABW	10.244	78.9	High income	808.2516
1	Afghanistan	AFG	35.253	5.9	Low income	207.9927
2	Angola	AGO	45.985	19.1	Upper middle income	878.3135
3	Albania	ALB	12.877	57.2	Upper middle income	736.5644
4	United Arab Emirates	ARE	11.044	88.0	High income	971.8720
...
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income	658.9400
191	South Africa	ZAF	20.850	46.5	Upper middle income	969.5250
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income	93.2668
193	Zambia	ZMB	40.471	15.4	Lower middle income	623.2534
194	Zimbabwe	ZWE	35.715	18.5	Low income	660.7275

195 rows × 6 columns

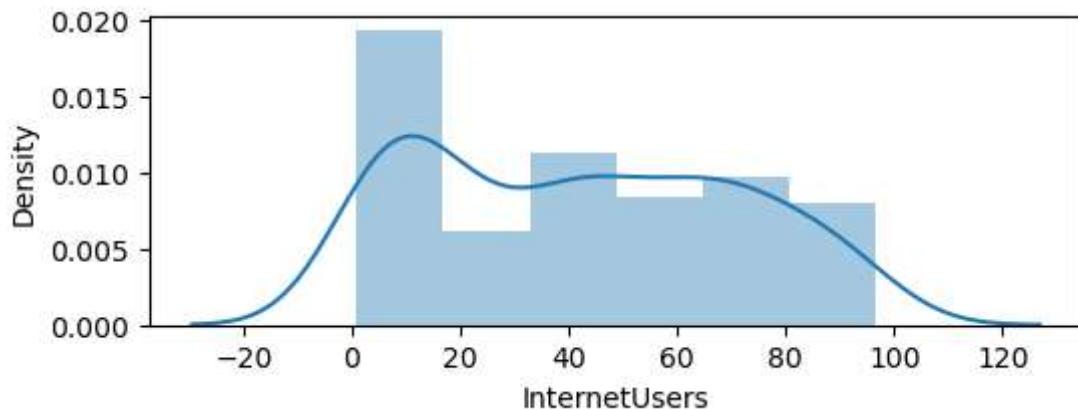
```
In [94]: stats['InternetUsers']
```

```
Out[94]: 0      78.9
1      5.9
2     19.1
3     57.2
4     88.0
...
190    20.0
191   46.5
192    2.2
193   15.4
194   18.5
Name: InternetUsers, Length: 195, dtype: float64
```

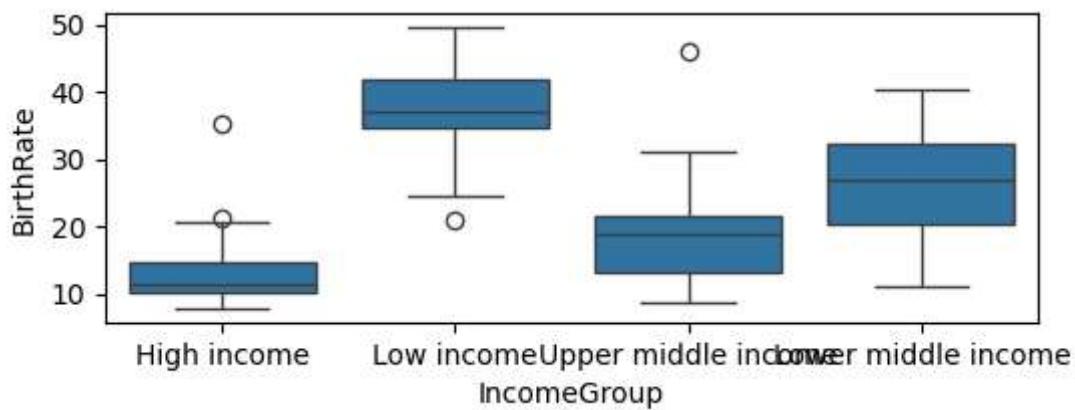
```
In [98]: vis1 = sns.distplot(stats['InternetUsers'])
plt.show()
```



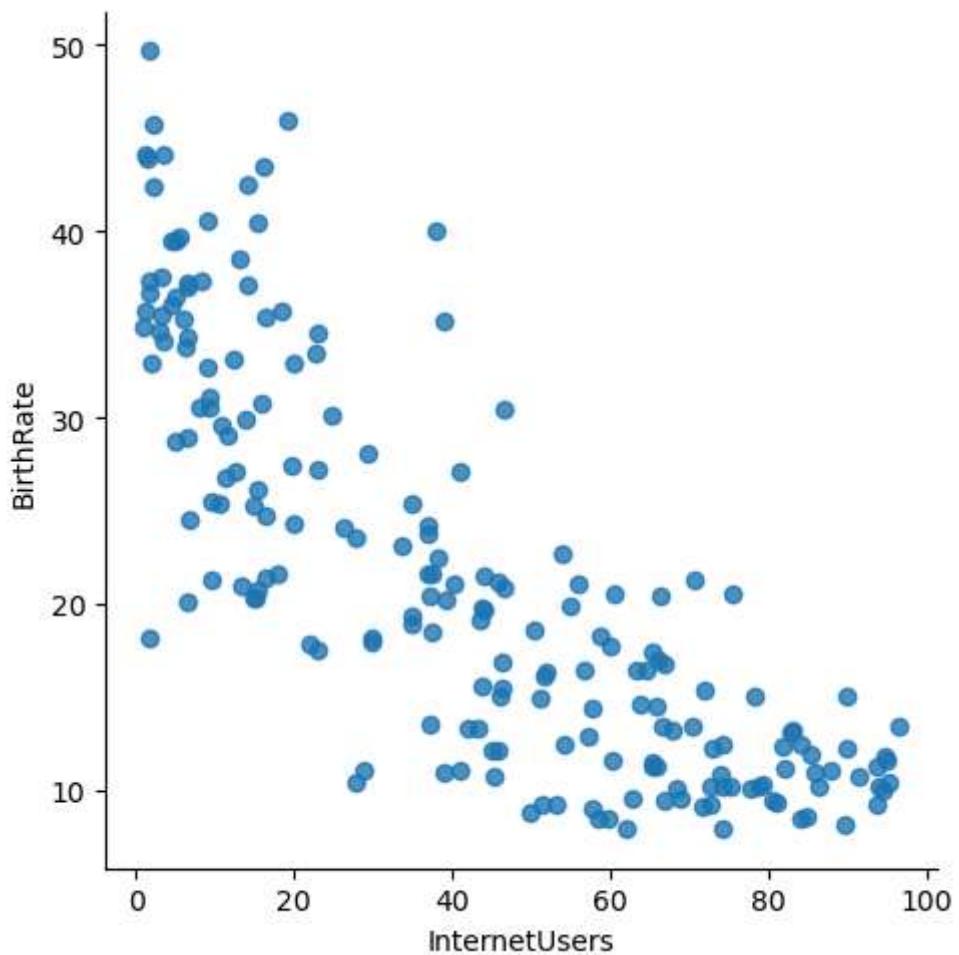
```
In [99]: vis2 = sns.distplot(stats['InternetUsers'])
plt.show()
```



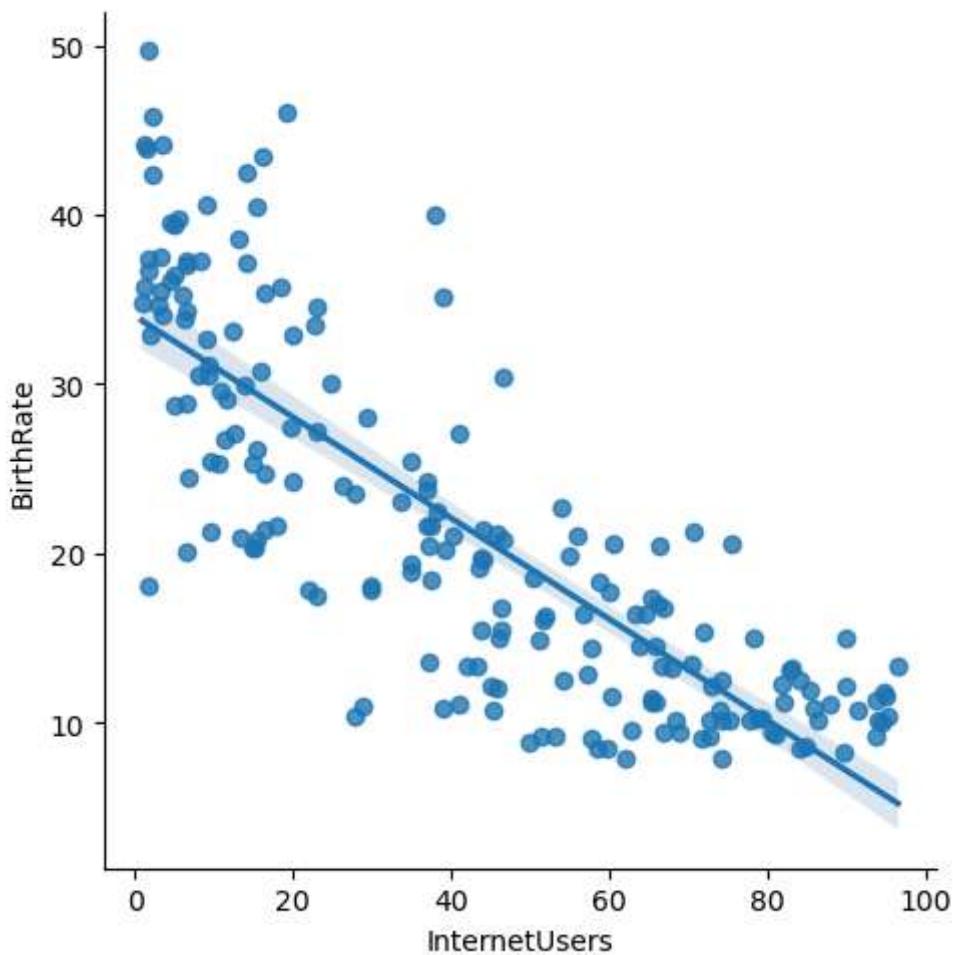
```
In [100...]: vis4 = sns.boxplot(data=stats,x="IncomeGroup",y="BirthRate")
plt.show()
```



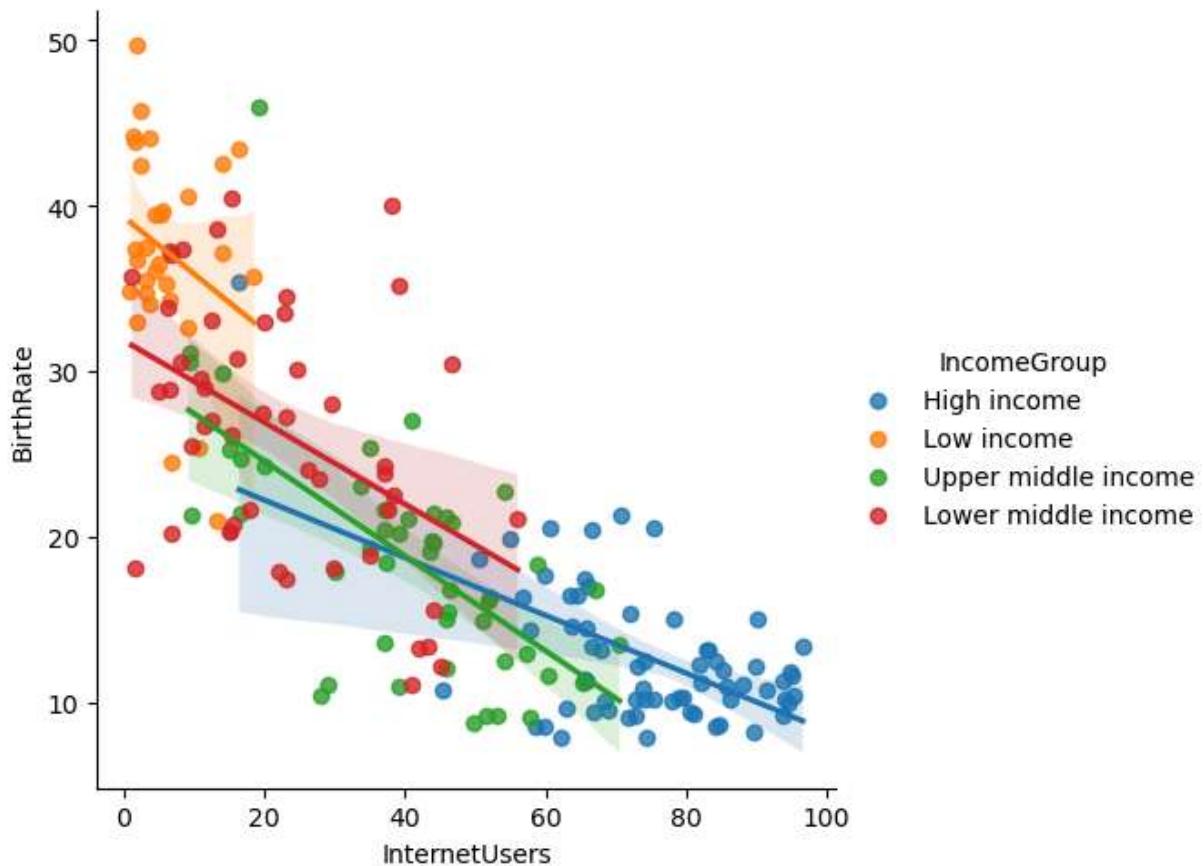
```
In [102...]: vis5 = sns.lmplot(data=stats,x="InternetUsers",y="BirthRate",fit_reg=False)
plt.show()
```



```
In [103]: vis5 = sns.lmplot(data=stats,x="InternetUsers",y="BirthRate",fit_reg=True)  
plt.show()
```



```
In [104]: vis5 = sns.lmplot(data=stats,x="InternetUsers",y="BirthRate",hue='IncomeGroup')  
plt.show()
```



In []: