

```
In [1]: import pandas as pd
```

```
In [2]: df=pd.read_csv(r'C:\Users\dell\Downloads\data.csv')
```

```
In [3]: df
```

Out[3]:

	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 [4]: len(df)
```

```
Out[4]: 195
```

```
In [5]: df.shape
```

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

```
In [6]: df.columns
```

```
Out[6]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
       dtype='object')
```

```
In [8]: df.info() #information about data
```

```
<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 [9]: `type(df)`

Out[9]: `pandas.core.frame.DataFrame`

In [10]: `df.columns #all columns`

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

In [11]: `len(df.columns) #Length of columns`

Out[11]: 5

In [12]: `df.head() #top 5 rows`

Out[12]:

	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 [13]: `df.head(3) # given condition for output`

Out[13]:

	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 [14]: `df.tail() #Bottom 5 row`

	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 [15]: `df.tail(2)`

	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 [16]: `df[::-1] # Reverse entire dataset`

	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 [17]: `df[:5] # fetch output 0 to 5-1=4`

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
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 [18]: df[6:] #output 6 to last row

Out[18]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
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
10	Azerbaijan	AZE	18.300	58.7000	Upper middle 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

189 rows × 5 columns

In [19]: df[0:200:10] # output is between 0 to 200 but 10 step jump

Out[19]:

	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 [20]: df[::30]

Out[20]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.90	High income
30	Canada	CAN	10.900	85.80	High income
60	Gabon	GAB	30.555	9.20	Upper middle income
90	Kazakhstan	KAZ	22.730	54.00	Upper middle income
120	Mozambique	MOZ	39.705	5.40	Low income
150	Sudan	SDN	33.477	22.70	Lower middle income
180	Uruguay	URY	14.374	57.69	High income

In [21]: df[10:20]

Out[21]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
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 [22]: df[:]

Out[22]:

	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 [23]: df.head()

Out[23]:

	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 [24]: df['CountryName'].head() # get output any one column

Out[24]: 0 Aruba
1 Afghanistan
2 Angola
3 Albania
4 United Arab Emirates
Name: CountryName, dtype: object

In [25]: df[['CountryName']].head() # get output any one column

Out[25]: **CountryName**
0 Aruba
1 Afghanistan
2 Angola
3 Albania
4 United Arab Emirates

In [26]: df[['CountryName', 'CountryCode']].head() # get output more than one column

Out[26]: **CountryName** **CountryCode**
0 Aruba ABW
1 Afghanistan AFG
2 Angola AGO
3 Albania ALB
4 United Arab Emirates AREIn [28]: # get output two specific condition
df[5:10][['CountryName', 'BirthRate']]

Out[28]:

	CountryName	BirthRate
5	Argentina	17.716
6	Armenia	13.308
7	Antigua and Barbuda	16.447
8	Australia	13.200
9	Austria	9.400

In [29]:

```
df[['CountryName', 'BirthRate']][5:10]
```

Out[29]:

	CountryName	BirthRate
5	Argentina	17.716
6	Armenia	13.308
7	Antigua and Barbuda	16.447
8	Australia	13.200
9	Austria	9.400

In [31]:

```
df.describe() # describe statistics (numeric) data
```

Out[31]:

	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 [32]:

```
df.describe().transpose() # in transpose function convert the data column to row &
```

Out[32]:

	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 [33]:

```
df.columns=['a','b','c','d','e'] #change column name
```

In [34]: `df.head(2)`

	a	b	c	d	e
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income

In [35]: `df`

	a	b	c	d	e
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 [36]: `df.columns=['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers', 'IncomeGroup']`

In [37]: `df`

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]: df[['CountryName', 'CountryCode']]

Out[38]:

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

195 rows × 2 columns

In [39]: df[['CountryName', 'CountryCode', 'BirthRate']]

Out[39]:

	CountryName	CountryCode	BirthRate
0	Aruba	ABW	10.244
1	Afghanistan	AFG	35.253
2	Angola	AGO	45.985
3	Albania	ALB	12.877
4	United Arab Emirates	ARE	11.044
...
190	Yemen, Rep.	YEM	32.947
191	South Africa	ZAF	20.850
192	Congo, Dem. Rep.	COD	42.394
193	Zambia	ZMB	40.471
194	Zimbabwe	ZWE	35.715

195 rows × 3 columns

In [40]:

`df.isnull()`

Out[40]:

	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 [42]:

`df.isnull().sum`

```
Out[42]: <bound method DataFrame.sum of
          CountryName  CountryCode  BirthRate  InternetU
          users  IncomeGroup
          0      False      False      False      False
          1      False      False      False      False
          2      False      False      False      False
          3      False      False      False      False
          4      False      False      False      False
          ..
          ...
          190     False      False      False      False
          191     False      False      False      False
          192     False      False      False      False
          193     False      False      False      False
          194     False      False      False      False
[195 rows x 5 columns]>
```

In [43]: df.dtypes

```
Out[43]: CountryName    object
          CountryCode    object
          BirthRate     float64
          InternetUsers float64
          IncomeGroup   object
          dtype: object
```

Mathematical operation in dataframes between two numerical column.

In [44]: # multiply birthrate column and interusers column
df.BirthRate*df.InternetUsers

```
Out[44]: 0      808.2516
          1      207.9927
          2      878.3135
          3      736.5644
          4      971.8720
          ...
          190     658.9400
          191     969.5250
          192     93.2668
          193     623.2534
          194     660.7275
          Length: 195, dtype: float64
```

In [46]: #Add new column in dataset
df['BR&IU']=df.BirthRate*df.InternetUsers

In [47]: df

Out[47]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	BR&IU
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 [48]:

```
# Remove any column in dataset
df.drop('BR&IU', axis=1)
```

Out[48]:

	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 [49]: df=df.drop('BR&IU',axis=1)

In [50]: df

Out[50]:

	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 [51]: df.head()

	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 [52]: `df.columns[2]`

Out[52]: 'BirthRate'

In [53]: `df.columns[4]`

Out[53]: 'IncomeGroup'

In [54]: `df.InternetUsers < 2 # checking given condition if its correct true or false`

Out[54]: 0 False
 1 False
 2 False
 3 False
 4 False
 ...
 190 False
 191 False
 192 False
 193 False
 194 False
Name: InternetUsers, Length: 195, dtype: bool

In [56]: `filter=df.InternetUsers < 2`

In [57]: `filter`

Out[57]: 0 False
 1 False
 2 False
 3 False
 4 False
 ...
 190 False
 191 False
 192 False
 193 False
 194 False
Name: InternetUsers, Length: 195, dtype: bool

In [58]: `df[filter]`

Out[58]:

	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 [59]: `filter1=df.BirthRate>40`In [60]: `filter1`

```
Out[60]: 0    False
1    False
2    True
3    False
4    False
...
190   False
191   False
192   True
193   True
194   False
Name: BirthRate, Length: 195, dtype: bool
```

In [61]: `df[filter1]`

Out[61]:

	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 [62]: `len(df[filter1])`

Out[62]: 12

In [63]: `len(df[filter])`

Out[63]: 9

In [64]: `#filter and filter1
filter & filter1`Out[64]: 0 False
1 False
2 False
3 False
4 False
...
190 False
191 False
192 False
193 False
194 False
Length: 195, dtype: boolIn [65]: `df[(df.BirthRate > 40) & (df.InternetUsers < 2)]`

Out[65]:

	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 [66]:

```
df[df.IncomeGroup=='Low income']
```

Out[66]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
1	Afghanistan	AFG	35.253	5.90	Low income
11	Burundi	BDI	44.151	1.30	Low income
13	Benin	BEN	36.440	4.90	Low income
14	Burkina Faso	BFA	40.551	9.10	Low income
29	Central African Republic	CAF	34.076	3.50	Low income
38	Comoros	COM	34.326	6.50	Low income
52	Eritrea	ERI	34.800	0.90	Low income
55	Ethiopia	ETH	32.925	1.90	Low income
64	Guinea	GIN	37.337	1.60	Low income
65	Gambia, The	GMB	42.525	14.00	Low income
66	Guinea-Bissau	GNB	37.503	3.10	Low income
77	Haiti	HTI	25.345	10.60	Low income
93	Cambodia	KHM	24.462	6.80	Low income
99	Liberia	LBR	35.521	3.20	Low income
111	Madagascar	MDG	34.686	3.00	Low income
115	Mali	MLI	44.138	3.50	Low income
120	Mozambique	MOZ	39.705	5.40	Low income
123	Malawi	MWI	39.459	5.05	Low income
127	Niger	NER	49.661	1.70	Low income
132	Nepal	NPL	20.923	13.30	Low income
148	Rwanda	RWA	32.689	9.00	Low income
154	Sierra Leone	SLE	36.729	1.70	Low income
156	Somalia	SOM	43.891	1.50	Low income
158	South Sudan	SSD	37.126	14.10	Low income
167	Chad	TCD	45.745	2.30	Low income
168	Togo	TGO	36.080	4.50	Low income
177	Tanzania	TZA	39.518	4.40	Low income
178	Uganda	UGA	43.474	16.20	Low income
192	Congo, Dem. Rep.	COD	42.394	2.20	Low income
194	Zimbabwe	ZWE	35.715	18.50	Low income

In [67]: `df[df.IncomeGroup=='High income']`

Out[67]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.90	High income
4	United Arab Emirates	ARE	11.044	88.00	High income
5	Argentina	ARG	17.716	59.90	High income
7	Antigua and Barbuda	ATG	16.447	63.40	High income
8	Australia	AUS	13.200	83.00	High income
...
174	Trinidad and Tobago	TTO	14.590	63.80	High income
180	Uruguay	URY	14.374	57.69	High income
181	United States	USA	12.500	84.20	High income
184	Venezuela, RB	VEN	19.842	54.90	High income
185	Virgin Islands (U.S.)	VIR	10.700	45.30	High income

67 rows × 5 columns

In [68]: `df.IncomeGroup.unique() #unique value`

Out[68]: `array(['High income', 'Low income', 'Upper middle income', 'Lower middle income'], dtype=object)`

In [69]: `len(df.IncomeGroup.unique())`

Out[69]: 4

Visualize this dataset using matplotlib and seaborn library

In [71]:

```
# Introduction to seaborn.
# Seaborn is very powerfull visualization(STATISTIC VISUALIZATION) PKG in python.

import matplotlib.pyplot as plt #visualisation
import seaborn as sns # distribution visualization

%matplotlib inline
plt.rcParams['figure.figsize']=8,4

import warnings
warnings.filterwarnings('ignore')
```

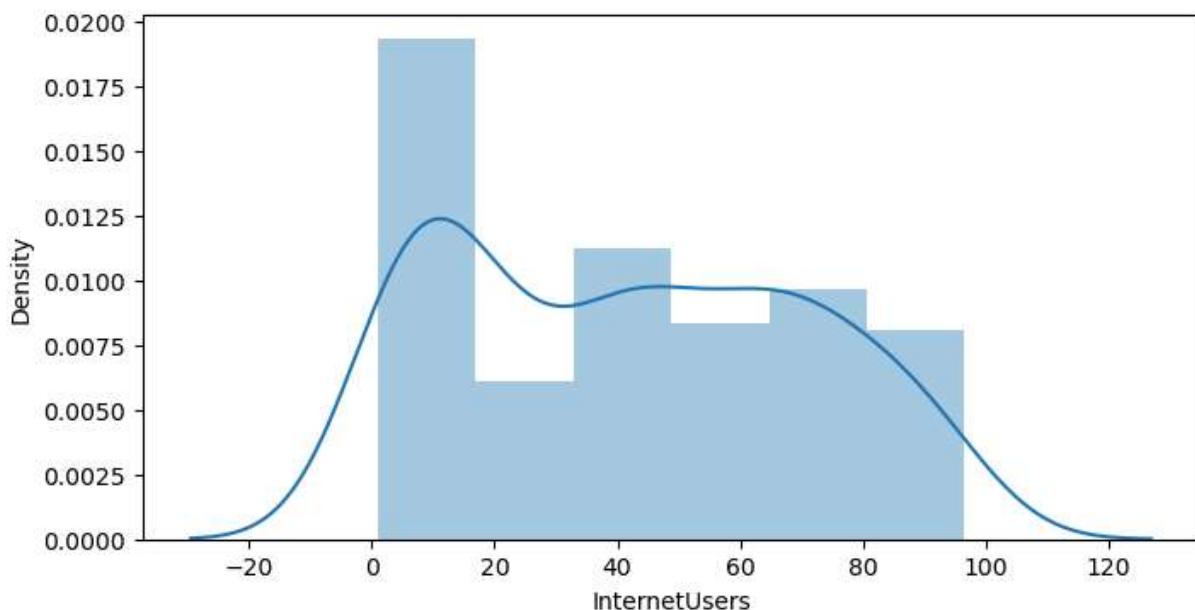
In [72]: `df.head()`

Out[72]:

	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

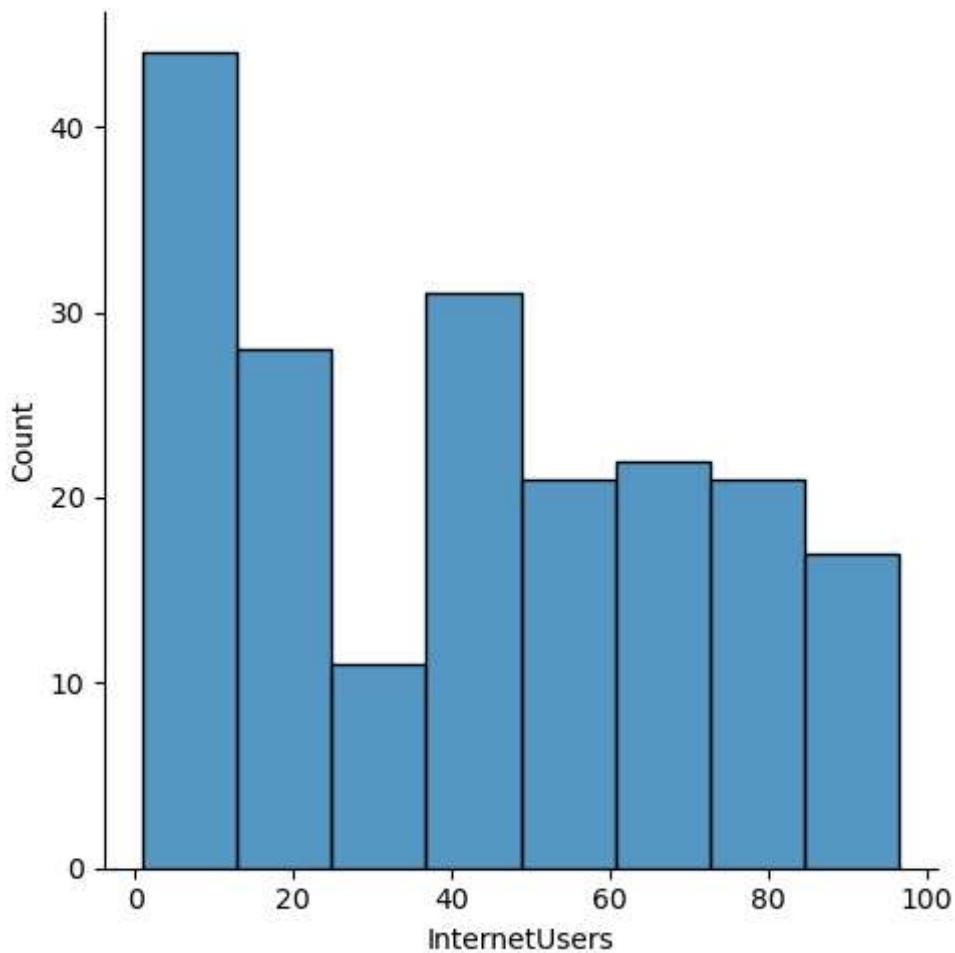
In [73]:

```
# Distribution:  
s1=sns.distplot(df["InternetUsers"])
```

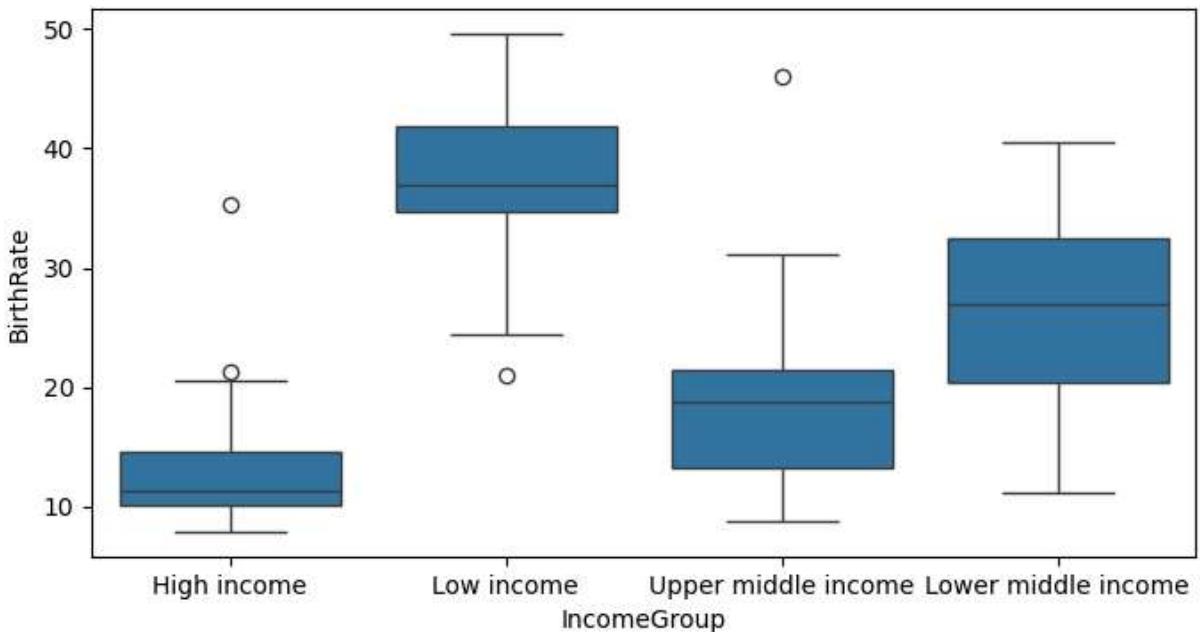


In [74]:

```
s2=sns.distplot(df["InternetUsers"],bins=8)
```

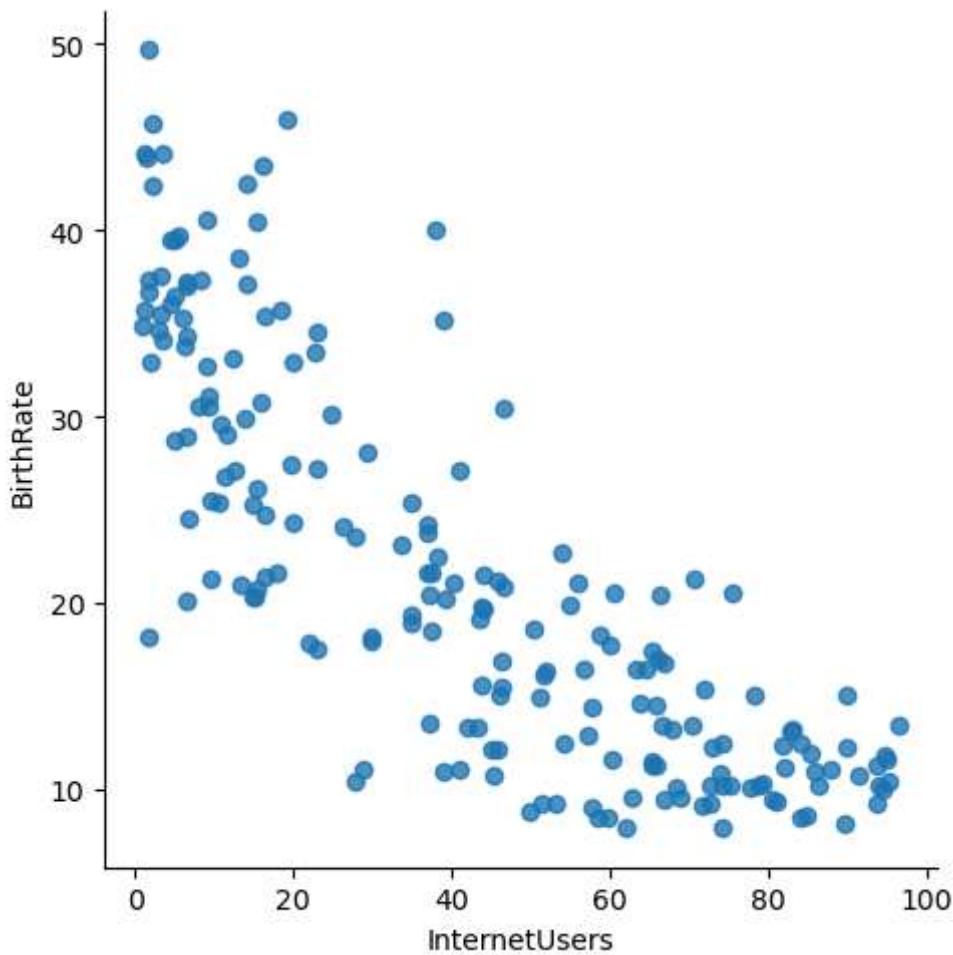


```
In [75]: # BOX PLOTS:  
sns.boxplot(data=df,x="IncomeGroup",y='BirthRate')
```

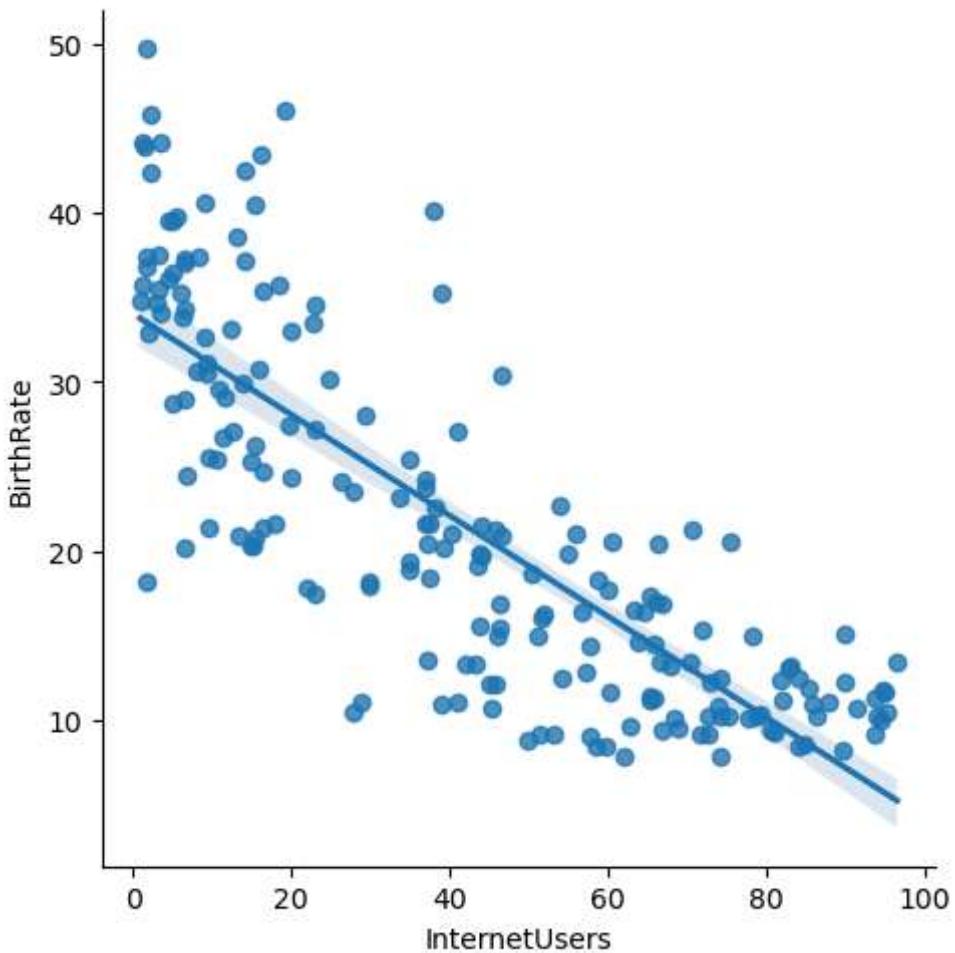


```
In [76]: #Seaborn gallery  
# visualizing with seaborn
```

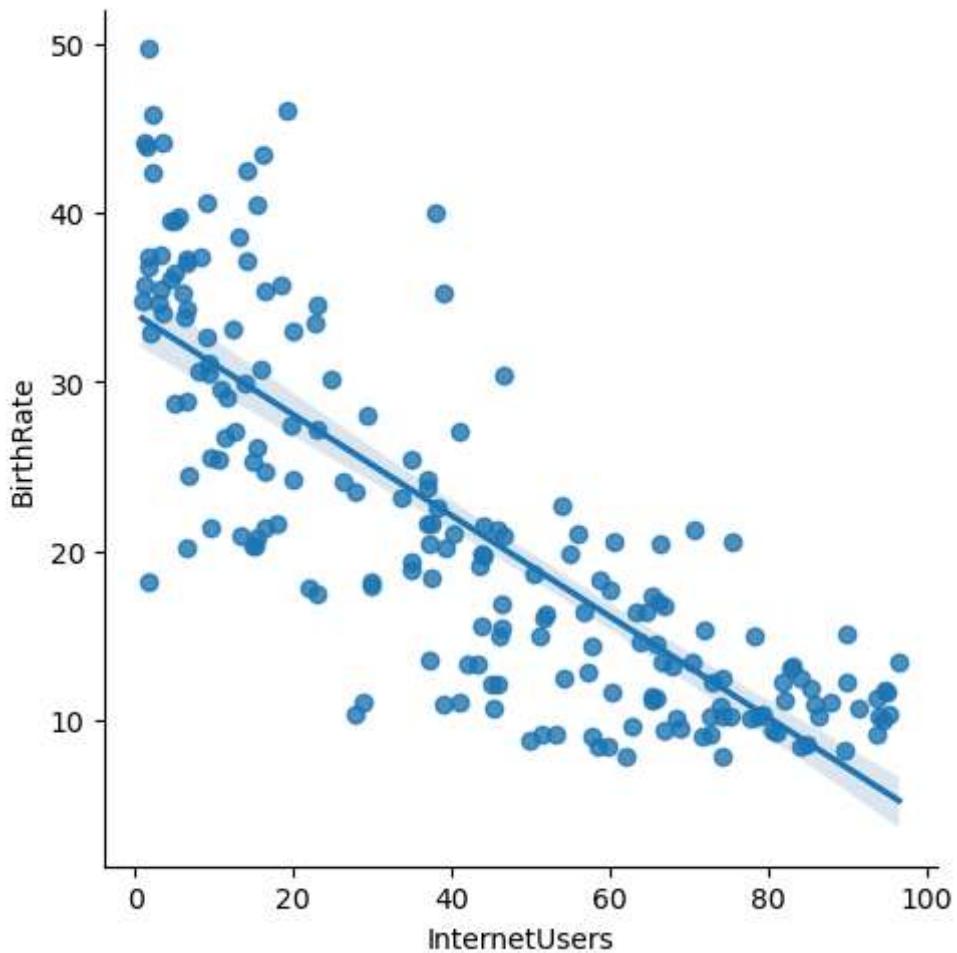
```
s4=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',fit_reg=False) #Lm-Linear mod
```



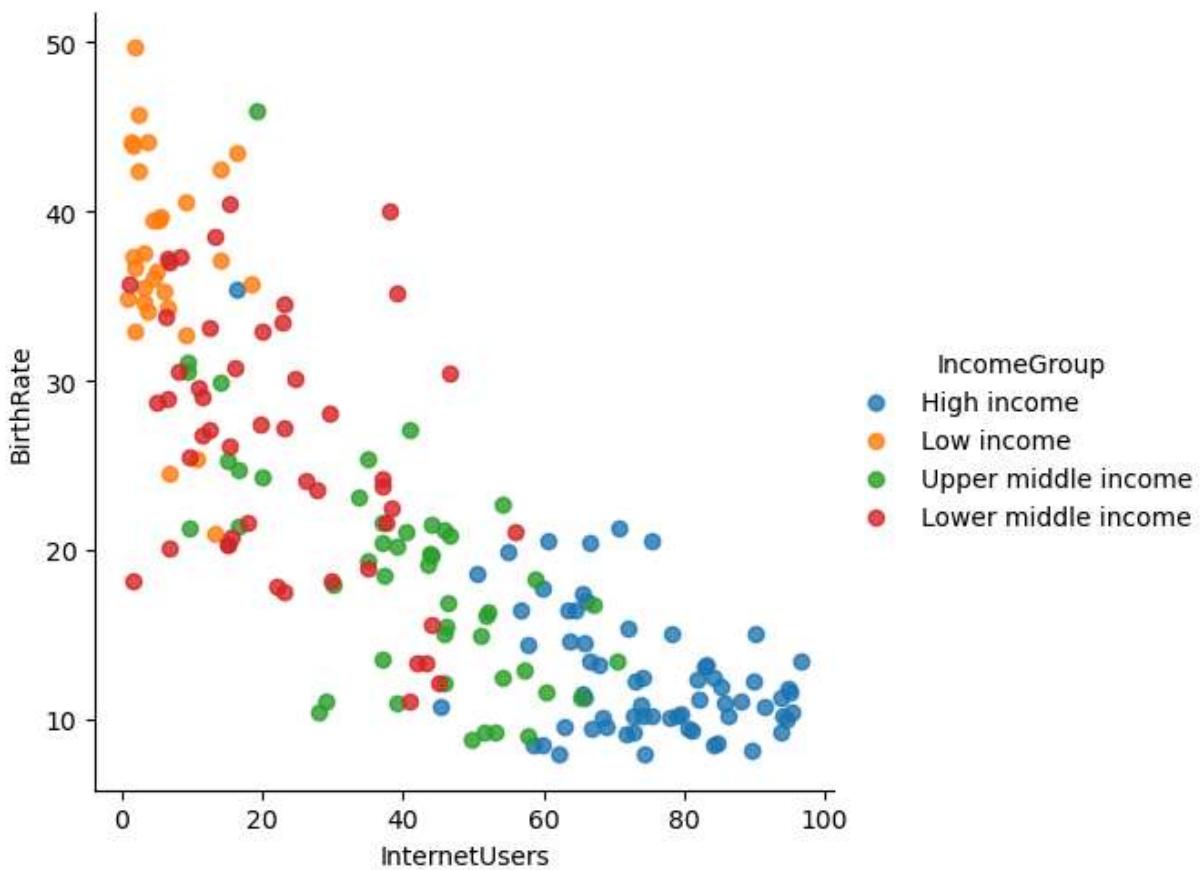
```
In [77]: s5=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',fit_reg=True) #Lm - Linear mo
```



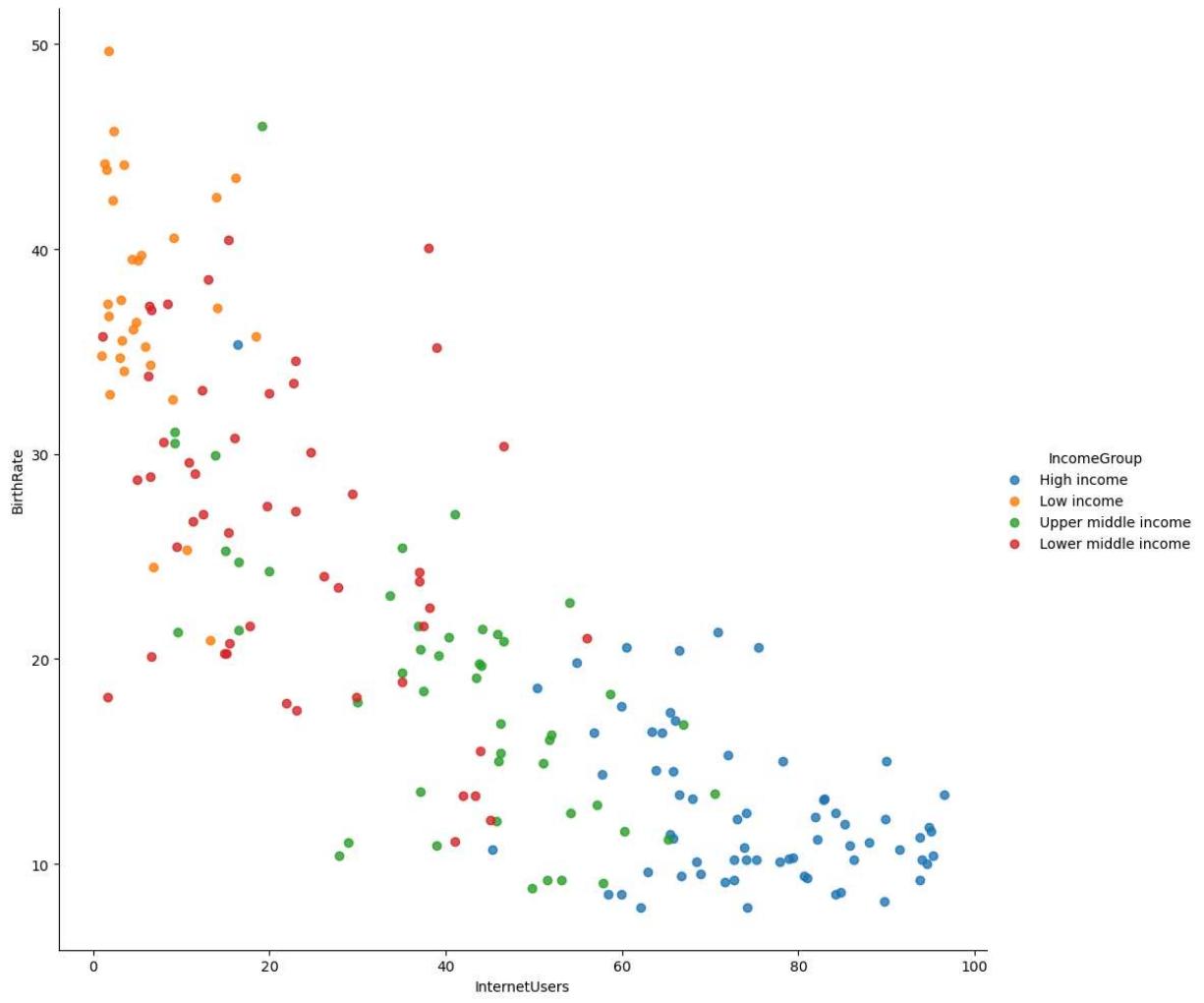
```
In [78]: s6=sns.lmplot(data=df,x='InternetUsers',y='BirthRate') #Lm - Linear model
```



```
In [79]: s7=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',
                     fit_reg=False,hue='IncomeGroup') # hue use - parameter for color
```



```
In [80]: s8=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',
                     fit_reg=False,hue = 'IncomeGroup',height=10)
```



```
In [81]: s8=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',
                     fit_reg=False,hue = 'IncomeGroup',height=8)
```

