

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

```
In [2]: pd.__version__
```

```
Out[2]: '2.3.3'
```

```
In [3]: df=pd.read_excel(r"C:\Users\abhis\Downloads\data.xlsx")
```

```
In [4]: df
```

```
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]: df.columns
```

```
Out[5]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
       dtype='object')
```

```
In [6]: df.head()
```

Out[6]:

	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 [7]: `df.tail()`

Out[7]:

	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 [8]: `df.shape`

Out[8]: `(195, 5)`

In [9]: `df.size`

Out[9]: `975`

In [10]: `len(df)`

Out[10]: `195`

In [11]: `df.isnull() ## is there any null value`

Out[11]:

	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 [12]:

`df.isna()`

Out[12]:

	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 [13]:

`df.isnull().sum()# check how many number of missing value`

```
Out[13]: CountryName      0  
CountryCode       0  
BirthRate         0  
InternetUsers    0  
IncomeGroup       0  
dtype: int64
```

```
In [14]: df.isna().sum()
```

```
Out[14]: CountryName      0  
CountryCode       0  
BirthRate         0  
InternetUsers    0  
IncomeGroup       0  
dtype: int64
```

```
In [15]: df.describe() # it is only return Numeric data
```

```
Out[15]: 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 [16]: df
```

Out[16]:

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

195 rows × 5 columns

In [17]: df[['BirthRate', 'InternetUsers']]

Out[17]:

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

195 rows × 2 columns

In [18]: df\_num=df[['BirthRate', 'InternetUsers']]  
df\_num

Out[18]:

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

195 rows × 2 columns

In [19]: df\_cat=df[['CountryName', 'CountryCode', 'IncomeGroup']]

In [20]: df\_cat

Out[20]:

	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 [21]:

```
print(df.shape)
print(df_num.shape)
```

```
print(df_cat.shape)
```

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

```
In [22]: print(df.columns)
print('####')
print(df_num.columns)
print('####')
print(df_cat.columns)
```

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

```
In [23]: df.columns
```

```
Out[23]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

```
In [24]: df
```

	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 [25]: df=pd.read_excel(r"C:\Users\abhis\Downloads\data.xlsx")
```

```
In [26]: df
```

Out[26]:

	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 [27]: df.columns

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

In [28]: df.columns=['a','b','c','d','e'] #here we are rename the column name

In [29]: df

Out[29]:

		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 [30]: `df.columns`Out[30]: `Index(['a', 'b', 'c', 'd', 'e'], dtype='object')`In [31]: `df.columns=[['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',  
'IncomeGroup']]  
df.head(2)`

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

In [32]: `df['InternetUsers']<2`

Out[32]:

InternetUsers	
0	False
1	False
2	False
3	False
4	False
...	...
190	False
191	False
192	False
193	False
194	False

195 rows × 1 columns

In [33]:

df[df['InternetUsers'] &lt; 2]

Out[33]:

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

195 rows × 5 columns

In [34]:

df.InternetUsers &lt; 2

Out[34]: **InternetUsers**

0	False
1	False
2	False
3	False
4	False
...	...
190	False
191	False
192	False
193	False
194	False

195 rows × 1 columns

In [35]: `df.head(1)`Out[35]: **CountryName CountryCode BirthRate InternetUsers IncomeGroup**

0	Aruba	ABW	10.244	78.9	High income
---	-------	-----	--------	------	-------------

In [36]: `df[df['BirthRate'] > 40]`

Out[36]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	NaN	NaN	NaN	NaN	NaN
1	NaN	NaN	NaN	NaN	NaN
2	NaN	NaN	45.985	NaN	NaN
3	NaN	NaN	NaN	NaN	NaN
4	NaN	NaN	NaN	NaN	NaN
...	...	...	...	...	...
190	NaN	NaN	NaN	NaN	NaN
191	NaN	NaN	NaN	NaN	NaN
192	NaN	NaN	42.394	NaN	NaN
193	NaN	NaN	40.471	NaN	NaN
194	NaN	NaN	NaN	NaN	NaN

195 rows × 5 columns

In [ ]:

In [37]: df.head(5)

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

In [38]: df.InternetUsers&lt;2

Out[38]:

InternetUsers	
0	False
1	False
2	False
3	False
4	False
...	...
190	False
191	False
192	False
193	False
194	False

195 rows × 1 columns

In [39]:

df

Out[39]:

	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 [40]:

import pandas as pd

In [41]:

pd.\_\_version\_\_

Out[41]: '2.3.3'

In [42]: df=pd.read\_excel(r"C:\Users\abhis\Downloads\data.xlsx")

In [43]: df

Out[43]:

	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 [44]: df.InternetUsers &lt;2

Out[44]:

```
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 [45]: df

Out[45]:

	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 [46]: Filter=df.InternetUsers &lt;2

In [47]: Filter

Out[47]: 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 [48]: df[Filter]

Out[48]:

	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 [49]:

`len(df[Filter])`

Out[49]: 9

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.BirthRate>40`

```
Out[51]: 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 [52]: Filter2=df.BirthRate>40 # always check condition
```

```
In [53]: Filter2
```

```
Out[53]: 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 [54]: df[Filter2]
```

	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 [55]: len(df[Filter2])
```

```
Out[55]: 12
```

```
In [56]: Filter & Filter2
```

```
Out[56]: 0      False
1      False
2      False
3      False
4      False
...
190     False
191     False
192     False
193     False
194     False
Length: 195, dtype: bool
```

```
In [57]: df[Filter & Filter2]
```

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

```
In [58]: df[(df.BirthRate >40) & (df.InternetUsers <2)]
```

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

```
In [59]: df.head(5)
```

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

```
In [60]: #Mathematical Operation
df.BirthRate * df.InternetUsers
```

```
Out[60]: 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 [61]: #Add a Column
df['MyClac'] = df.BirthRate * df.InternetUsers
```

```
In [62]: df
```

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
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 [63]: df
```

Out[63]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
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 [64]: df

Out[64]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
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 [65]: `df[df.IncomeGroup == 'High Income'] #we are creating new exiting table`

Out[65]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
	df					

In [66]: `df`

Out[66]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
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 [67]: df[df.IncomeGroup == 'Low income']

Out[67]:	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
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	MyClac
194	Zimbabwe	ZWE	35.715	18.50	Low income	660.72750

In [68]: df

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
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 [69]: df[df.IncomeGroup == 'High income']

Out[69]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
0	Aruba	ABW	10.244	78.90	High income	808.25160
4	United Arab Emirates	ARE	11.044	88.00	High income	971.87200
5	Argentina	ARG	17.716	59.90	High income	1061.18840
7	Antigua and Barbuda	ATG	16.447	63.40	High income	1042.73980
8	Australia	AUS	13.200	83.00	High income	1095.60000
...	...	...	...	...	...	...
174	Trinidad and Tobago	TTO	14.590	63.80	High income	930.84200
180	Uruguay	URY	14.374	57.69	High income	829.23606
181	United States	USA	12.500	84.20	High income	1052.50000
184	Venezuela, RB	VEN	19.842	54.90	High income	1089.32580
185	Virgin Islands (U.S.)	VIR	10.700	45.30	High income	484.71000

67 rows × 6 columns

In [70]: # how to get the unique catagories  
df.IncomeGroup.nunique()

Out[70]: 4

In [71]: df[df.IncomeGroup == 'Upper middle income']

Out[71]:		CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
2	Angola	AGO	45.985	19.100000	Upper middle income	878.313500	
3	Albania	ALB	12.877	57.200000	Upper middle income	736.564400	
10	Azerbaijan	AZE	18.300	58.700000	Upper middle income	1074.210000	
16	Bulgaria	BGR	9.200	53.061500	Upper middle income	488.165800	
19	Bosnia and Herzegovina	BIH	9.062	57.790000	Upper middle income	523.692980	
20	Belarus	BLR	12.500	54.170000	Upper middle income	677.125000	
21	Belize	BLZ	23.092	33.600000	Upper middle income	775.891200	
24	Brazil	BRA	14.931	51.040000	Upper middle income	762.078240	
28	Botswana	BWA	25.267	15.000000	Upper middle income	379.005000	
33	China	CHN	12.100	45.800000	Upper middle income	554.180000	
37	Colombia	COL	16.076	51.700000	Upper middle income	831.129200	
40	Costa Rica	CRI	15.022	45.960000	Upper middle income	690.411120	
41	Cuba	CUB	10.400	27.930000	Upper middle income	290.472000	
48	Dominican Republic	DOM	21.198	45.900000	Upper middle income	972.988200	
49	Algeria	DZA	24.738	16.500000	Upper middle income	408.177000	
50	Ecuador	ECU	21.070	40.353684	Upper middle income	850.252127	
57	Fiji	FJI	20.463	37.100000	Upper middle income	759.177300	
60	Gabon	GAB	30.555	9.200000	Upper middle income	281.106000	
69	Grenada	GRD	19.334	35.000000	Upper middle income	676.690000	

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
82	Iran, Islamic Rep.	IRN	17.900	29.950000	Upper middle income	536.105000
83	Iraq	IRQ	31.093	9.200000	Upper middle income	286.055600
87	Jamaica	JAM	13.540	37.100000	Upper middle income	502.334000
88	Jordan	JOR	27.046	41.000000	Upper middle income	1108.886000
90	Kazakhstan	KAZ	22.730	54.000000	Upper middle income	1227.420000
98	Lebanon	LBN	13.426	70.500000	Upper middle income	946.533000
100	Libya	LBY	21.425	16.500000	Upper middle income	353.512500
101	St. Lucia	LCA	15.430	46.200000	Upper middle income	712.866000
112	Maldives	MDV	21.447	44.100000	Upper middle income	945.812700
113	Mexico	MEX	19.104	43.460000	Upper middle income	830.259840
114	Macedonia, FYR	MKD	11.222	65.240000	Upper middle income	732.123280
118	Montenegro	MNE	11.616	60.310000	Upper middle income	700.560960
119	Mongolia	MNG	24.275	20.000000	Upper middle income	485.500000
122	Mauritius	MUS	10.900	39.000000	Upper middle income	425.100000
124	Malaysia	MYS	16.805	66.970000	Upper middle income	1125.430850
125	Namibia	NAM	29.937	13.900000	Upper middle income	416.124300
136	Panama	PAN	19.680	44.030000	Upper middle income	866.510400
137	Peru	PER	20.198	39.200000	Upper middle income	791.761600
143	Paraguay	PRY	21.588	36.900000	Upper middle income	796.597200

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
146	Romania	ROU	8.800	49.764500	Upper middle income	437.927600
157	Serbia	SRB	9.200	51.500000	Upper middle income	473.800000
160	Suriname	SUR	18.455	37.400000	Upper middle income	690.217000
169	Thailand	THA	11.041	28.940000	Upper middle income	319.526540
171	Turkmenistan	TKM	21.322	9.600000	Upper middle income	204.691200
173	Tonga	TON	25.409	35.000000	Upper middle income	889.315000
175	Tunisia	TUN	19.800	43.800000	Upper middle income	867.240000
176	Turkey	TUR	16.836	46.250000	Upper middle income	778.665000
183	St. Vincent and the Grenadines	VCT	16.306	52.000000	Upper middle income	847.912000
191	South Africa	ZAF	20.850	46.500000	Upper middle income	969.525000

In [72]: df[df.IncomeGroup == 'Lower middle income']

Out[72]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
6	Armenia	ARM	13.308	41.9000	Lower middle income	557.605200
15	Bangladesh	BGD	20.142	6.6300	Lower middle income	133.541460
23	Bolivia	BOL	24.236	36.9400	Lower middle income	895.277840
27	Bhutan	BTN	18.134	29.9000	Lower middle income	542.206600
34	Cote d'Ivoire	CIV	37.320	8.4000	Lower middle income	313.488000
35	Cameroon	CMR	37.236	6.4000	Lower middle income	238.310400
36	Congo, Rep.	COG	37.011	6.6000	Lower middle income	244.272600
39	Cabo Verde	CPV	21.625	37.5000	Lower middle income	810.937500
46	Djibouti	DJI	25.486	9.5000	Lower middle income	242.117000
51	Egypt, Arab Rep.	EGY	28.032	29.4000	Lower middle income	824.140800
59	Micronesia, Fed. Sts.	FSM	23.511	27.8000	Lower middle income	653.605800
62	Georgia	GEO	13.332	43.3000	Lower middle income	577.275600
63	Ghana	GHA	33.131	12.3000	Lower middle income	407.511300
71	Guatemala	GTM	27.465	19.7000	Lower middle income	541.060500
73	Guyana	GUY	18.885	35.0000	Lower middle income	660.975000
75	Honduras	HND	21.593	17.8000	Lower middle income	384.355400
79	Indonesia	IDN	20.297	14.9400	Lower middle income	303.237180
80	India	IND	20.291	15.1000	Lower middle income	306.394100
91	Kenya	KEN	35.194	39.0000	Lower middle income	1372.566000

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
92	Kyrgyz Republic	KGZ	27.200	23.0000	Lower middle income	625.600000
94	Kiribati	KIR	29.044	11.5000	Lower middle income	334.006000
97	Lao PDR	LAO	27.051	12.5000	Lower middle income	338.137500
103	Sri Lanka	LKA	17.863	21.9000	Lower middle income	391.199700
104	Lesotho	LSO	28.738	5.0000	Lower middle income	143.690000
109	Morocco	MAR	21.023	56.0000	Lower middle income	1177.288000
110	Moldova	MDA	12.141	45.0000	Lower middle income	546.345000
117	Myanmar	MMR	18.119	1.6000	Lower middle income	28.990400
121	Mauritania	MRT	33.801	6.2000	Lower middle income	209.566200
128	Nigeria	NGA	40.045	38.0000	Lower middle income	1521.710000
129	Nicaragua	NIC	20.788	15.5000	Lower middle income	322.214000
135	Pakistan	PAK	29.582	10.9000	Lower middle income	322.443800
138	Philippines	PHL	23.790	37.0000	Lower middle income	880.230000
139	Papua New Guinea	PNG	28.899	6.5000	Lower middle income	187.843500
150	Sudan	SDN	33.477	22.7000	Lower middle income	759.927900
151	Senegal	SEN	38.533	13.1000	Lower middle income	504.782300
153	Solomon Islands	SLB	30.578	8.0000	Lower middle income	244.624000
155	El Salvador	SLV	17.476	23.1093	Lower middle income	403.858127
159	Sao Tome and Principe	STP	34.537	23.0000	Lower middle income	794.351000

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
164	Swaziland	SWZ	30.093	24.7000	Lower middle income	743.297100
166	Syrian Arab Republic	SYR	24.043	26.2000	Lower middle income	629.926600
170	Tajikistan	TJK	30.792	16.0000	Lower middle income	492.672000
172	Timor-Leste	TLS	35.755	1.1000	Lower middle income	39.330500
179	Ukraine	UKR	11.100	41.0000	Lower middle income	455.100000
182	Uzbekistan	UZB	22.500	38.2000	Lower middle income	859.500000
186	Vietnam	VNM	15.537	43.9000	Lower middle income	682.074300
187	Vanuatu	VUT	26.739	11.3000	Lower middle income	302.150700
188	West Bank and Gaza	PSE	30.394	46.6000	Lower middle income	1416.360400
189	Samoa	WSM	26.172	15.3000	Lower middle income	400.431600
190	Yemen, Rep.	YEM	32.947	20.0000	Lower middle income	658.940000
193	Zambia	ZMB	40.471	15.4000	Lower middle income	623.253400

```
In [73]: # Introduction to seaborn is very powerfull visualization(STATITC VISULLAZATION)pkg

import matplotlib.pyplot as plt #visulzation
import seaborn as sns # distribution visualtions
# seaborn are used for advance visualization e.x-distribution plot,Line plot
%matplotlib inline
plt.rcParams['figure.figsize']=6,2 #6-width and 2-height

import warnings
warnings.filterwarnings('ignore')# os error
```

## SEABORN

```
In [74]: df.head()
```

Out[74]:	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyClac
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

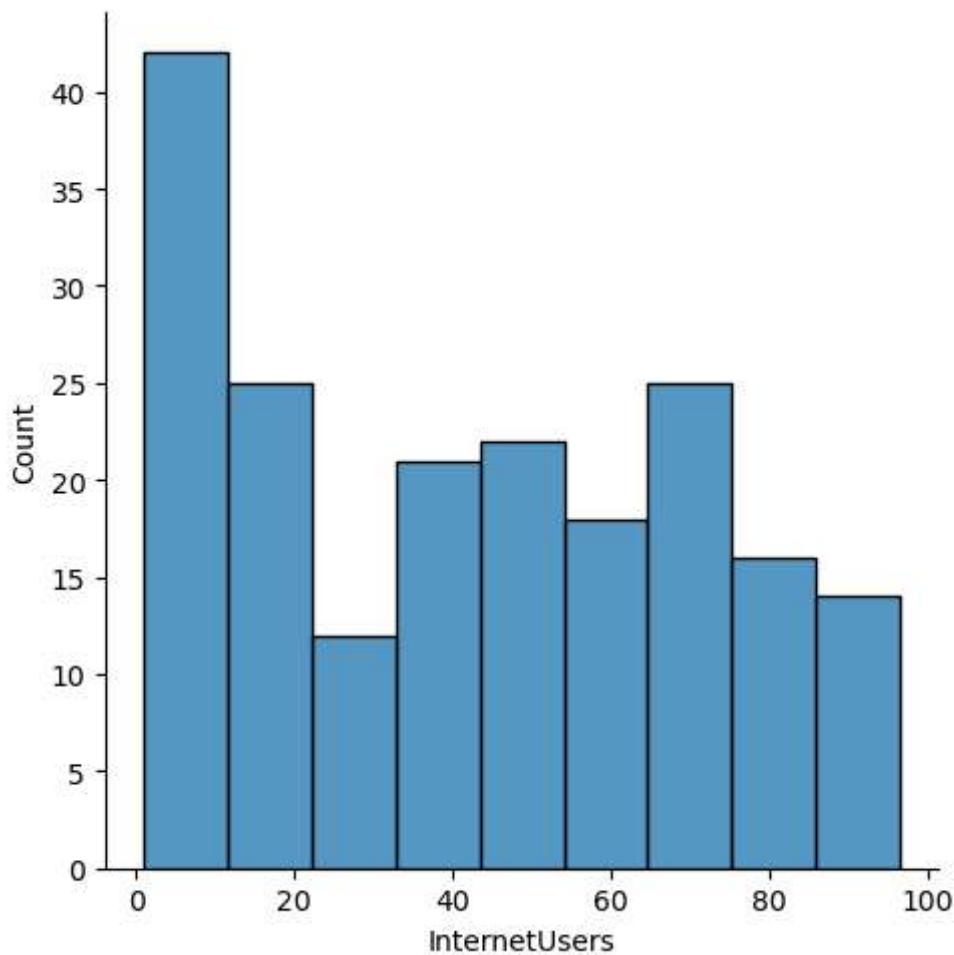
In [75]: `df['InternetUsers']`

Out[75]:

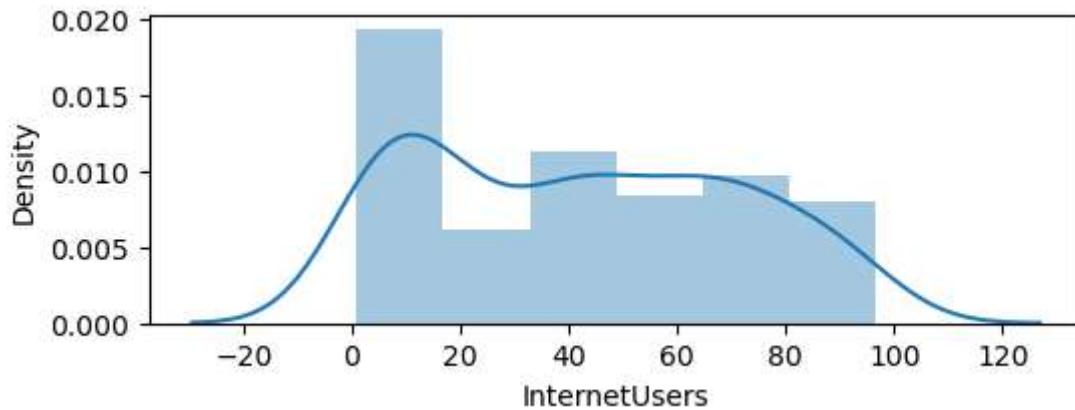
0	78.9
1	5.9
2	19.1
3	57.2
4	88.0
	...
190	20.0
191	46.5
192	2.2
193	15.4
194	18.5

Name: InternetUsers, Length: 195, dtype: float64

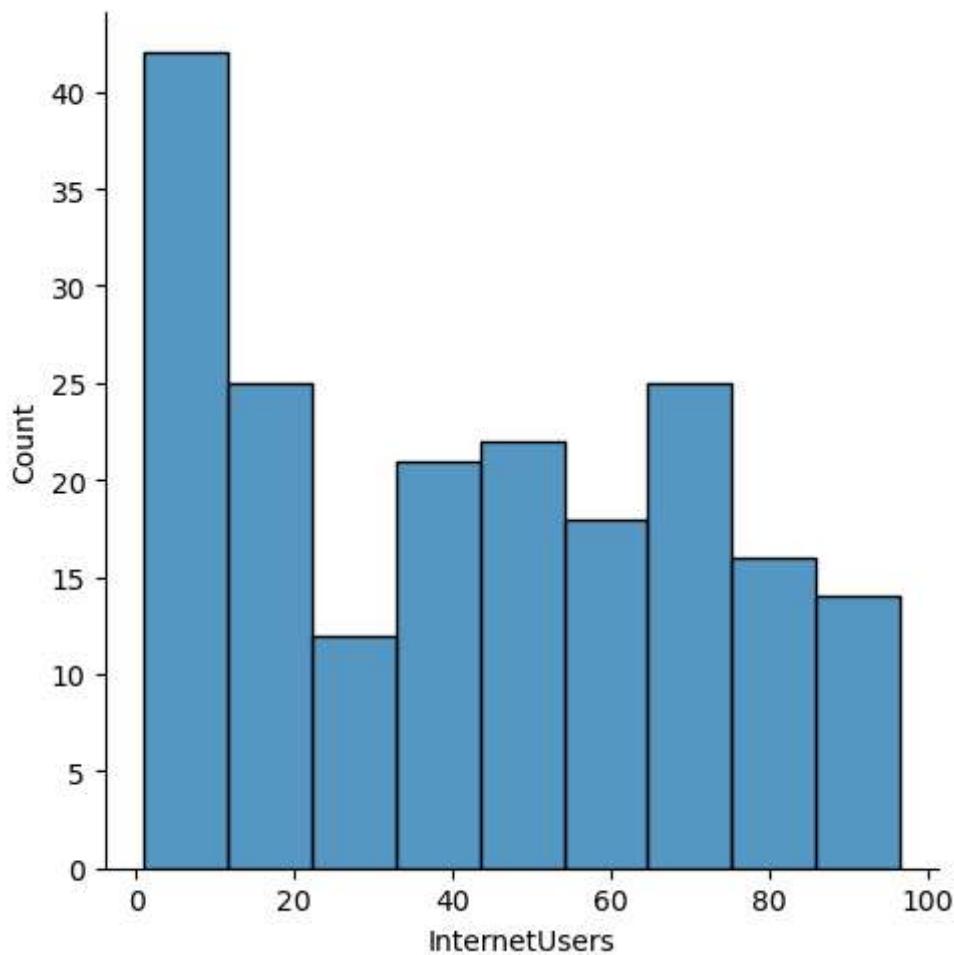
In [76]: `# Distribution Graph  
vis1=sns.displot(df['InternetUsers']) # UNIVARIATE -statistics  
plt.show(vis1)`



```
In [77]: #distribution  
vis1=sns.distplot(df['InternetUsers']) # UNIVARIATE ANALYSIS -statistics  
plt.show(vis1)
```

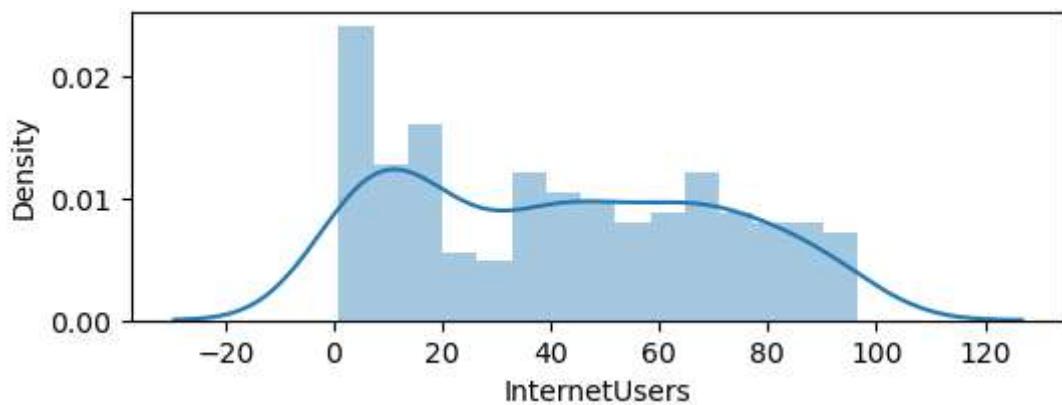


```
In [78]: vis2=sns.distplot(df['InternetUsers'])  
plt.show()
```



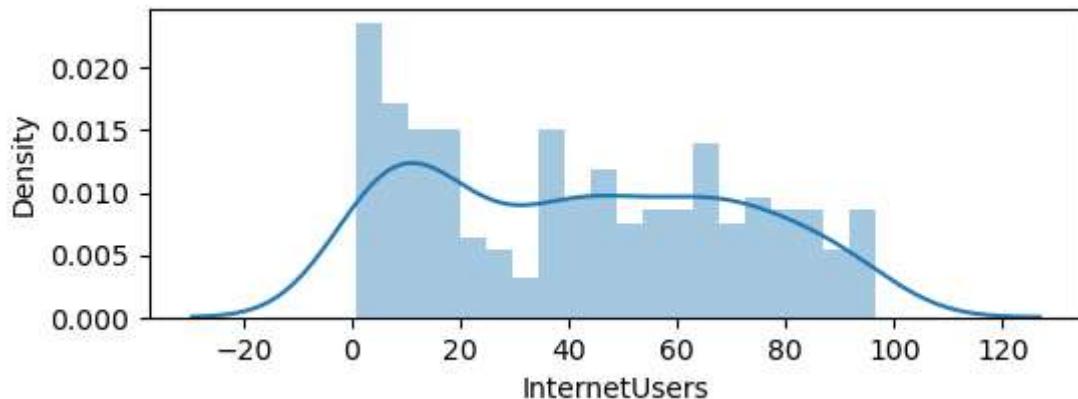
```
In [79]: vis3=sns.distplot(df['InternetUsers'],bins=15) # bins means 15 stack has created  
vis3
```

```
Out[79]: <Axes: xlabel='InternetUsers', ylabel='Density'>
```



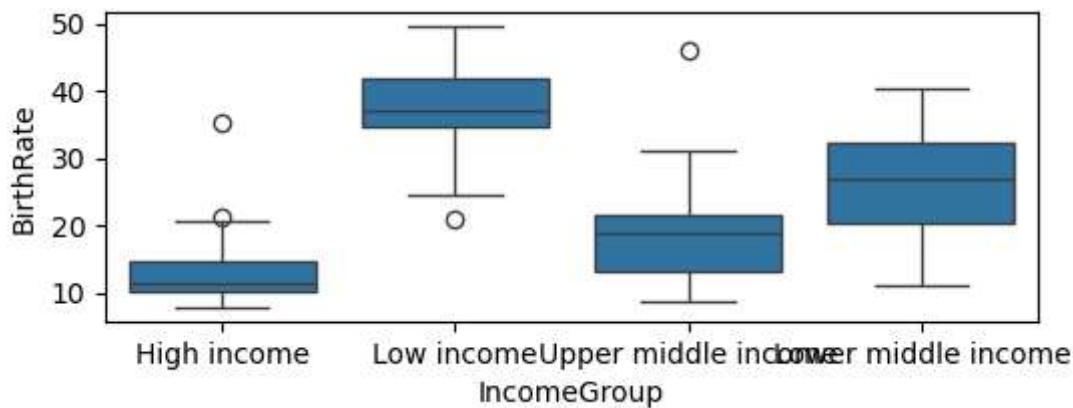
```
In [80]: vis3=sns.distplot(df['InternetUsers'],bins=20) # bins means 20 stack has created  
vis3
```

```
Out[80]: <Axes: xlabel='InternetUsers', ylabel='Density'>
```



## BOXPLOT :

```
In [81]: vis4=sns.boxplot(data = df, x='IncomeGroup',y='BirthRate') #BI-VARIATE ANALYSIS  
plt.show()
```



```
In [82]: import seaborn as sns
```

```
In [83]: import pandas as pd
```

```
In [84]: df=pd.read_excel(r"C:\Users\abhis\Downloads\data.xlsx")
```

```
In [85]: df
```

Out[85]:

	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

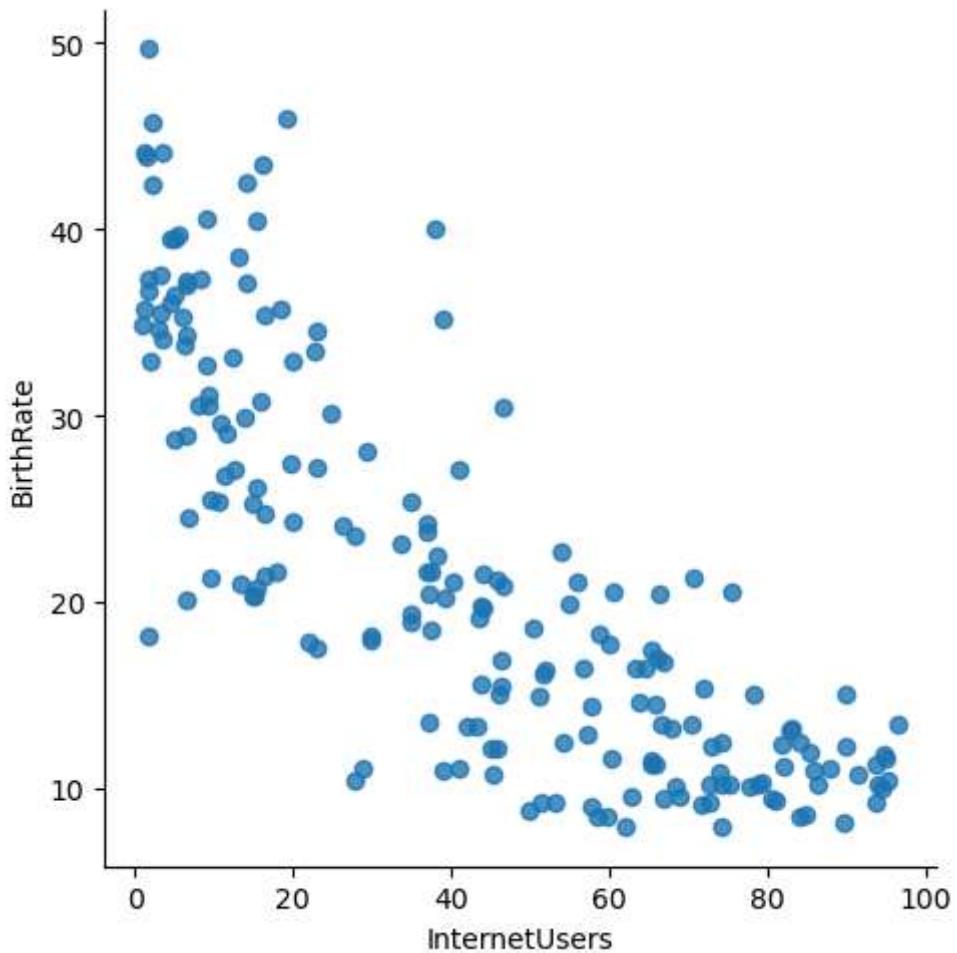
In [86]: `import matplotlib.pyplot as plt`In [87]: `df=pd.read_excel(r"C:\Users\abhis\Downloads\data.xlsx")  
df`

Out[87]:

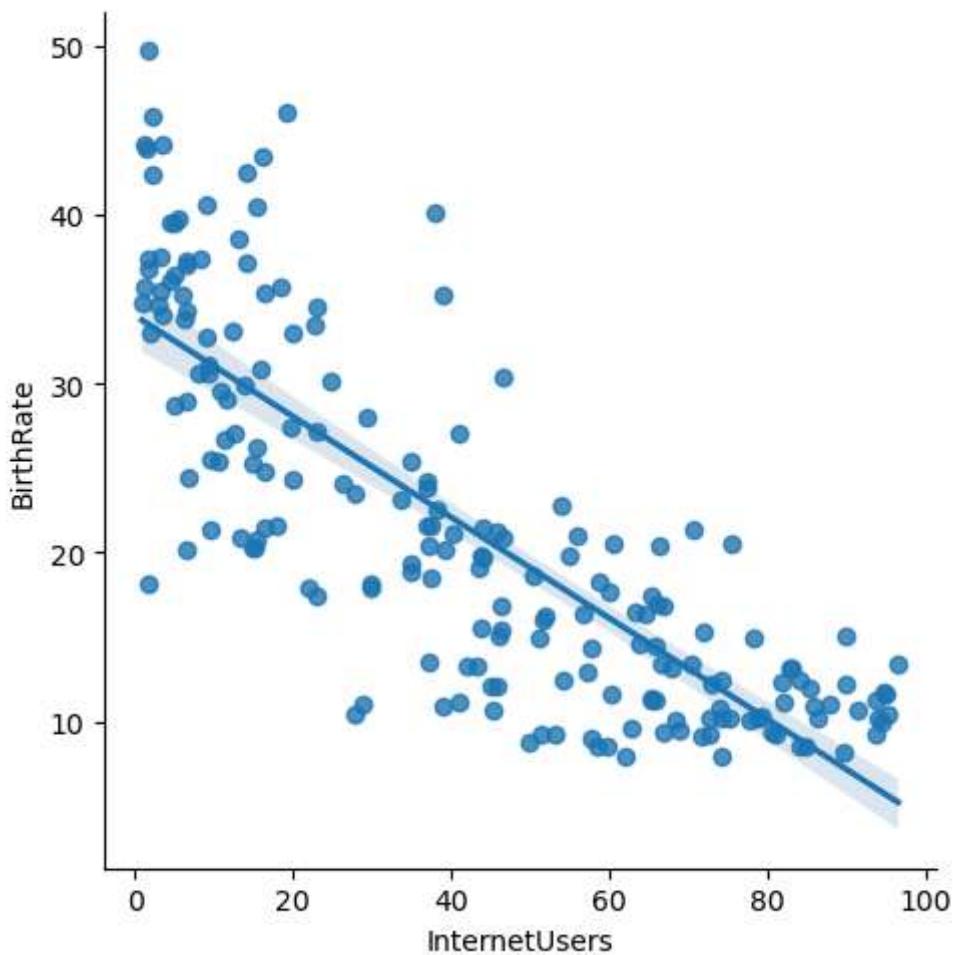
	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
0	Aruba	ABW	10.244	78.9	High income
1	Afghanistan	AFG	35.253	5.9	Low income
2	Angola	AGO	45.985	19.1	Upper middle income
3	Albania	ALB	12.877	57.2	Upper middle income
4	United Arab Emirates	ARE	11.044	88.0	High income
...	...	...	...	...	...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

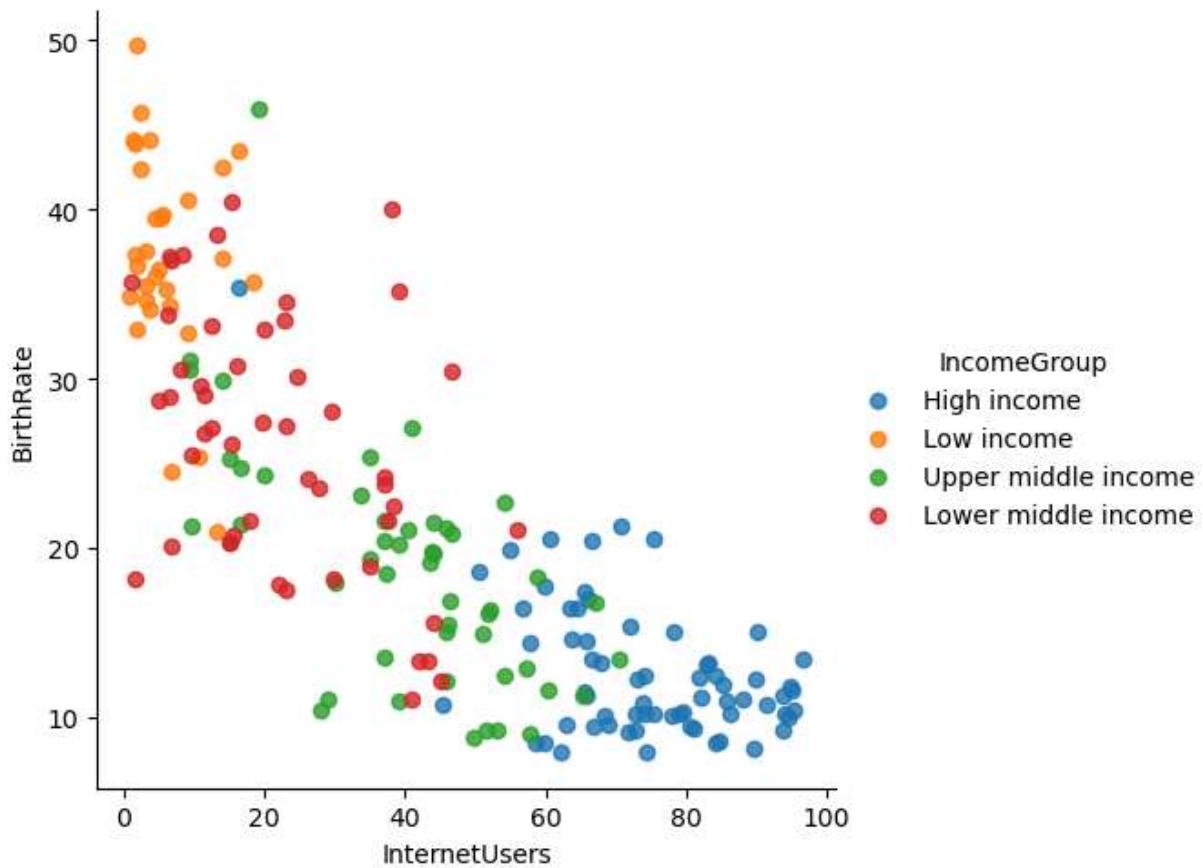
In [88]: `vis5=sns.lmplot(data = df,x='InternetUsers',y='BirthRate',fit_reg=False) #Lm-Linear`



```
In [89]: vis5=sns.lmplot(data = df,x='InternetUsers',y='BirthRate',fit_reg=True)
```



```
In [90]: vis6=sns.lmplot(data =df,x ='InternetUsers',y='BirthRate',fit_reg=False,hue='Income')
```



```
In [91]: import seaborn as sns
# seaborn are a very powerful for statictal visualization
import pandas as pd
import matplotlib.pyplot as plt

import warnings
warnings.filterwarnings('ignore')

%matplotlib inline
plt.rcParams['figure.figsize']=6,5
```

```
In [92]: df=pd.read_excel(r"C:\Users\abhis\Downloads\data.xlsx")
```

```
In [93]: df
```

Out[93]:

	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 [94]: `import pandas as pd`

In [95]: `df=pd.read_excel(r"C:\Users\abhis\Downloads\data.xlsx")  
df`

Out[95]:

	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 [96]: `df.head(4)`

Out[96]:

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

In [97]: df.columns

Out[97]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers', 'IncomeGroup'], dtype='object')

In [100...]: df['MyCalc']=df.InternetUsers \* df.BirthRate  
df

Out[100...]:

	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 [105...]: df[(df.InternetUsers >40) & (df.BirthRate<2)]  
df

Out[105...]

	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 [110...]

filter3=df.InternetUsers &gt;40

In [111...]

filter3

Out[111...]

```

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

```

In [112...]

df[filter3]

Out[112...]

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyCalc
0	Aruba	ABW	10.244	78.9	High income	808.2516
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
5	Argentina	ARG	17.716	59.9	High income	1061.1884
6	Armenia	ARM	13.308	41.9	Lower middle income	557.6052
...	...	...	...	...	...	...
184	Venezuela, RB	VEN	19.842	54.9	High income	1089.3258
185	Virgin Islands (U.S.)	VIR	10.700	45.3	High income	484.7100
186	Vietnam	VNM	15.537	43.9	Lower middle income	682.0743
188	West Bank and Gaza	PSE	30.394	46.6	Lower middle income	1416.3604
191	South Africa	ZAF	20.850	46.5	Upper middle income	969.5250

100 rows × 6 columns

In [113...]

len(df[filter3])

Out[113...]

100

In [118...]

filter4=df.BirthRate<10  
filter4

Out[118...]

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

In [119...]

df[filter4]

Out[119...]

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyCalc
9	Austria	AUT	9.400	80.6188	High income	757.81672
16	Bulgaria	BGR	9.200	53.0615	Upper middle income	488.16580
19	Bosnia and Herzegovina	BIH	9.062	57.7900	Upper middle income	523.69298
45	Germany	DEU	8.500	84.1700	High income	715.44500
53	Spain	ESP	9.100	71.6350	High income	651.87850
68	Greece	GRC	8.500	59.8663	High income	508.86355
74	Hong Kong SAR, China	HKG	7.900	74.2000	High income	586.18000
76	Croatia	HRV	9.400	66.7476	High income	627.42744
78	Hungary	HUN	9.200	72.6439	High income	668.32388
86	Italy	ITA	8.500	58.4593	High income	496.90405
89	Japan	JPN	8.200	89.7100	High income	735.62200
95	Korea, Rep.	KOR	8.600	84.7700	High income	729.02200
102	Liechtenstein	LIE	9.200	93.8000	High income	862.96000
116	Malta	MLT	9.500	68.9138	High income	654.68110
140	Poland	POL	9.600	62.8492	High income	603.35232
142	Portugal	PRT	7.900	62.0956	High income	490.55524
146	Romania	ROU	8.800	49.7645	Upper middle income	437.92760
152	Singapore	SGP	9.300	81.0000	High income	753.30000
157	Serbia	SRB	9.200	51.5000	Upper middle income	473.80000

In [120...]

len(df[filter4])

Out[120...]

19

In [121...]

df[filter3 &amp; filter4]

Out[121...]

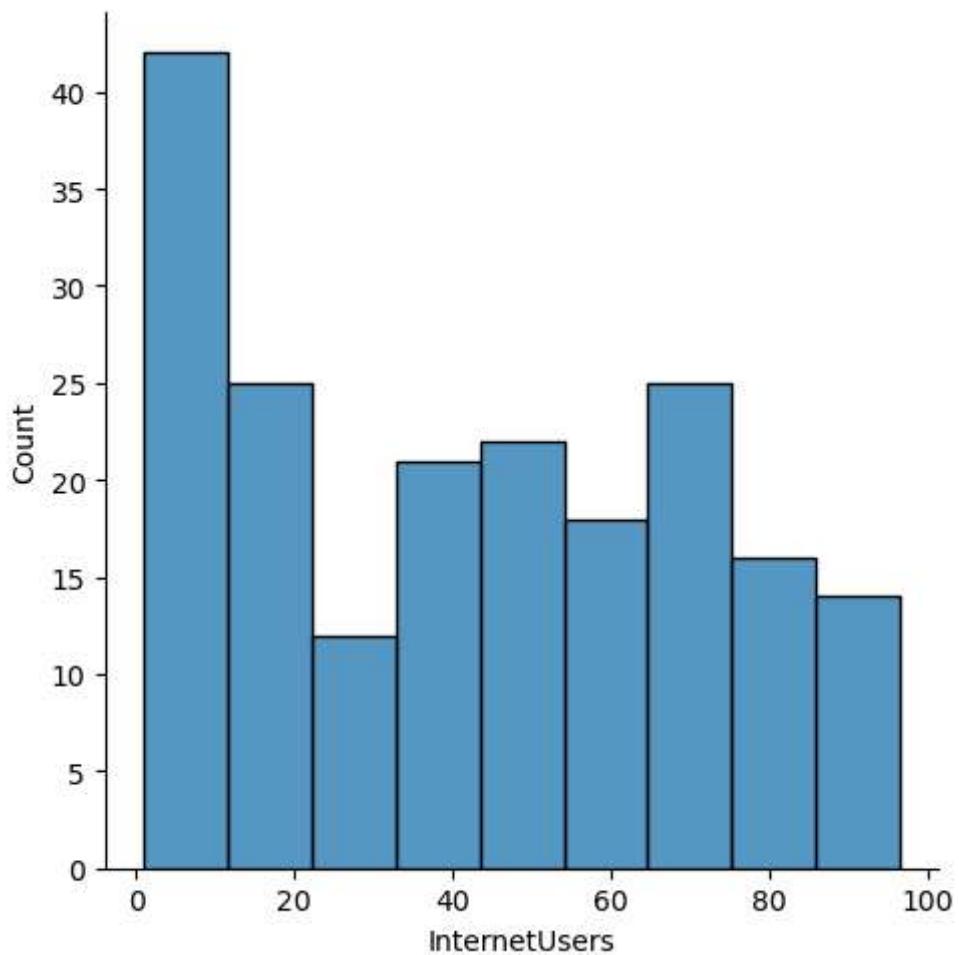
	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	MyCalc
9	Austria	AUT	9.400	80.6188	High income	757.81672
16	Bulgaria	BGR	9.200	53.0615	Upper middle income	488.16580
19	Bosnia and Herzegovina	BIH	9.062	57.7900	Upper middle income	523.69298
45	Germany	DEU	8.500	84.1700	High income	715.44500
53	Spain	ESP	9.100	71.6350	High income	651.87850
68	Greece	GRC	8.500	59.8663	High income	508.86355
74	Hong Kong SAR, China	HKG	7.900	74.2000	High income	586.18000
76	Croatia	HRV	9.400	66.7476	High income	627.42744
78	Hungary	HUN	9.200	72.6439	High income	668.32388
86	Italy	ITA	8.500	58.4593	High income	496.90405
89	Japan	JPN	8.200	89.7100	High income	735.62200
95	Korea, Rep.	KOR	8.600	84.7700	High income	729.02200
102	Liechtenstein	LIE	9.200	93.8000	High income	862.96000
116	Malta	MLT	9.500	68.9138	High income	654.68110
140	Poland	POL	9.600	62.8492	High income	603.35232
142	Portugal	PRT	7.900	62.0956	High income	490.55524
146	Romania	ROU	8.800	49.7645	Upper middle income	437.92760
152	Singapore	SGP	9.300	81.0000	High income	753.30000
157	Serbia	SRB	9.200	51.5000	Upper middle income	473.80000

In [123...]

```
vis1=sns.displot(df['InternetUsers'])
vis1
```

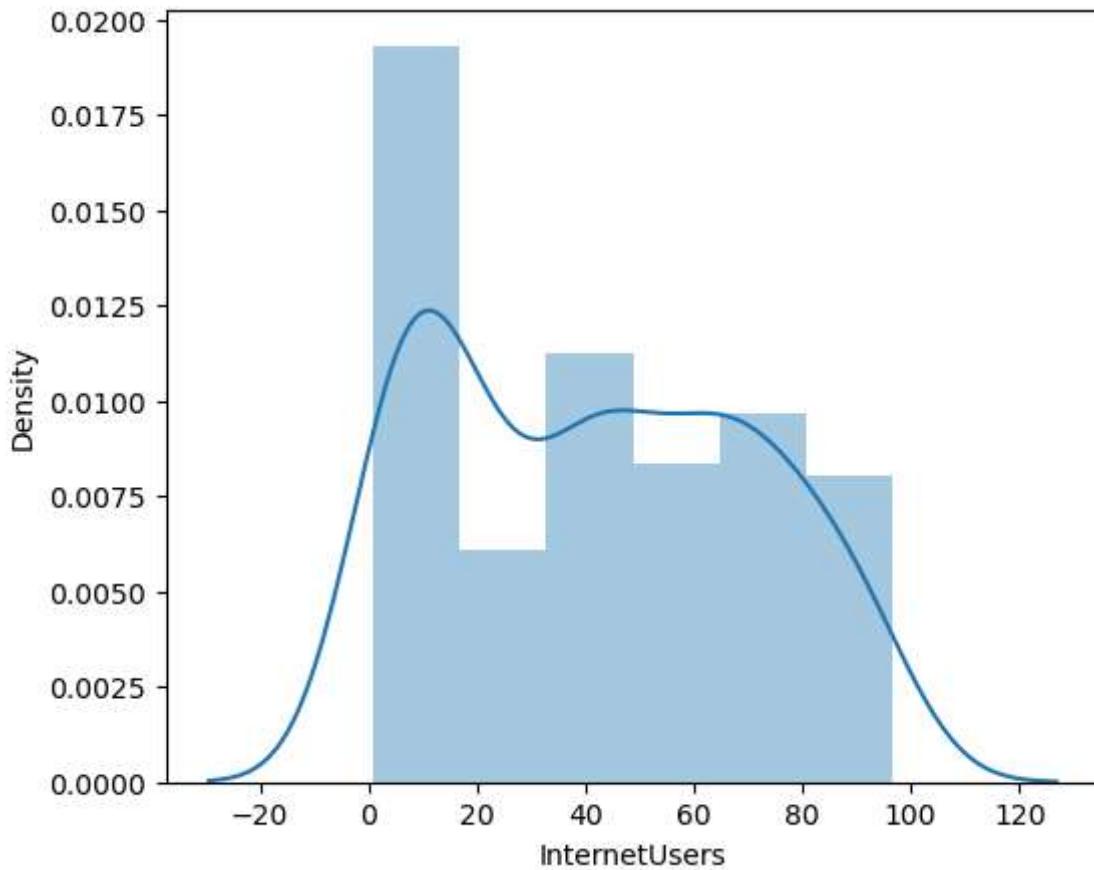
Out[123...]

```
<seaborn.axisgrid.FacetGrid at 0x20435fa0550>
```



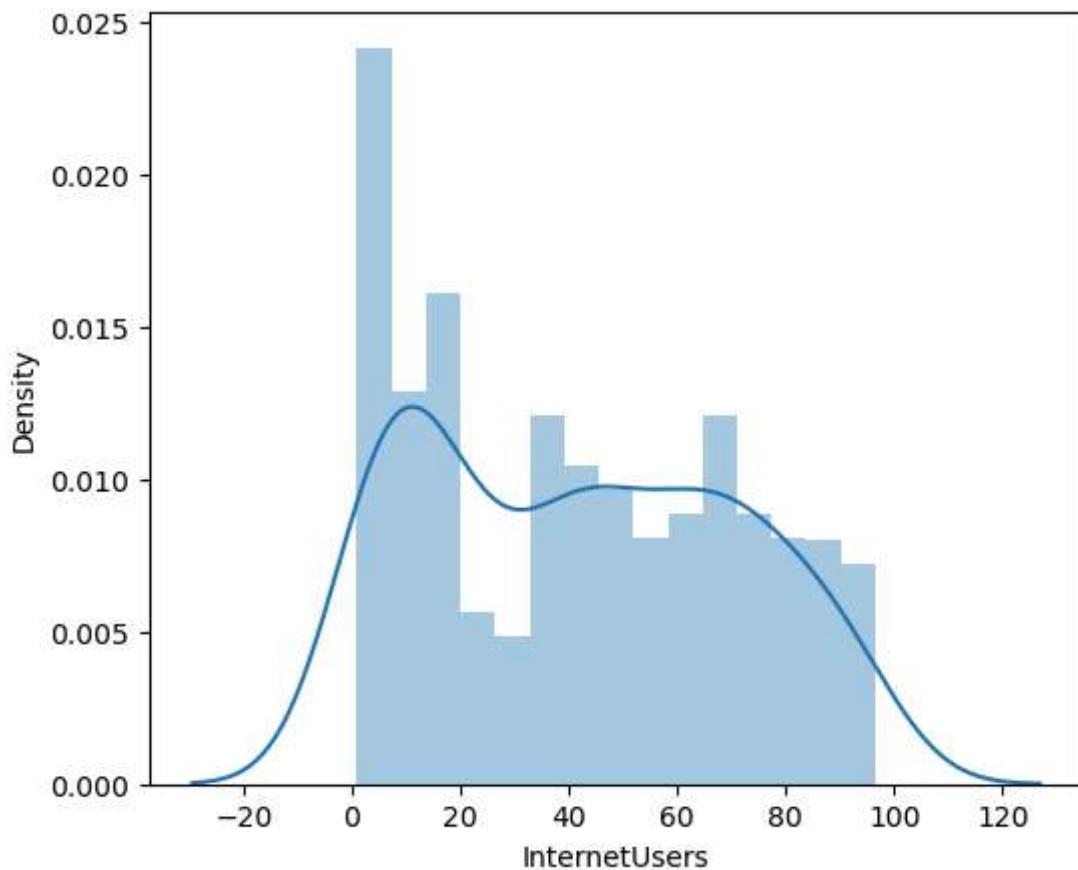
```
In [124]: vis1=sns.distplot(df['InternetUsers'])  
vis1
```

```
Out[124]: <Axes: xlabel='InternetUsers', ylabel='Density'>
```

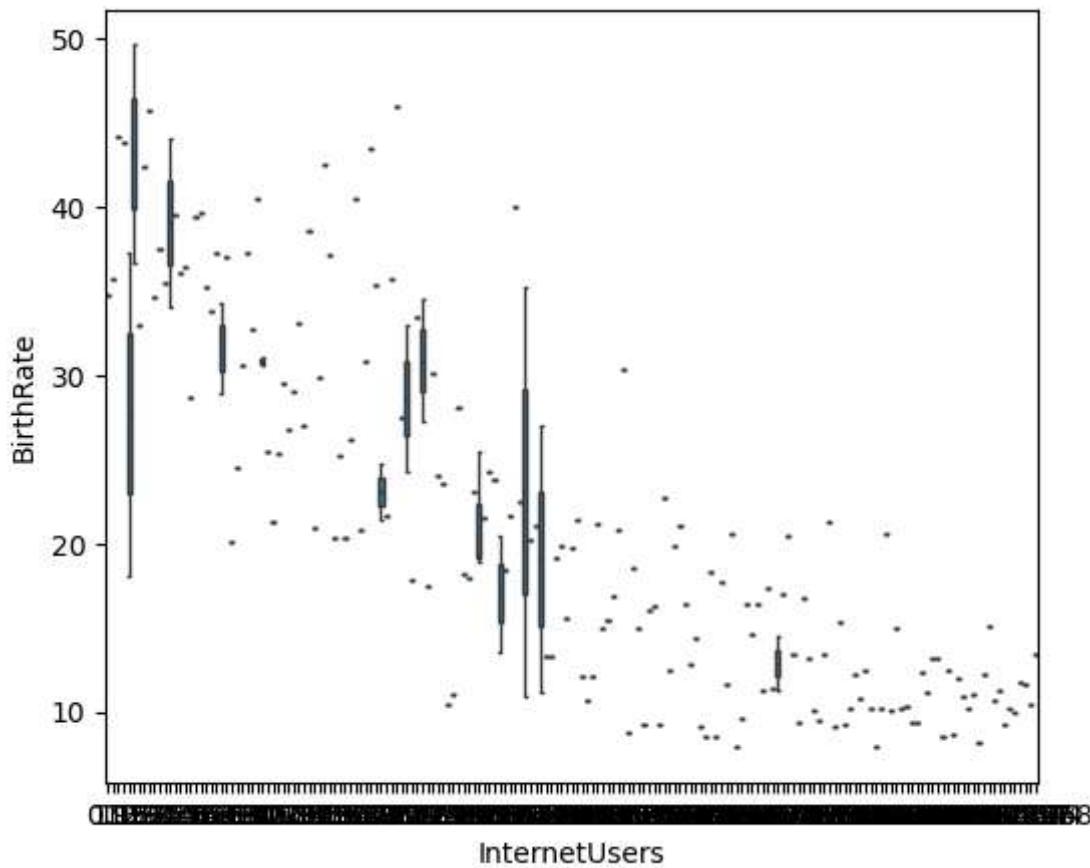


```
In [126... vis2=sns.distplot(df['InternetUsers'],bins=15)
vis2
```

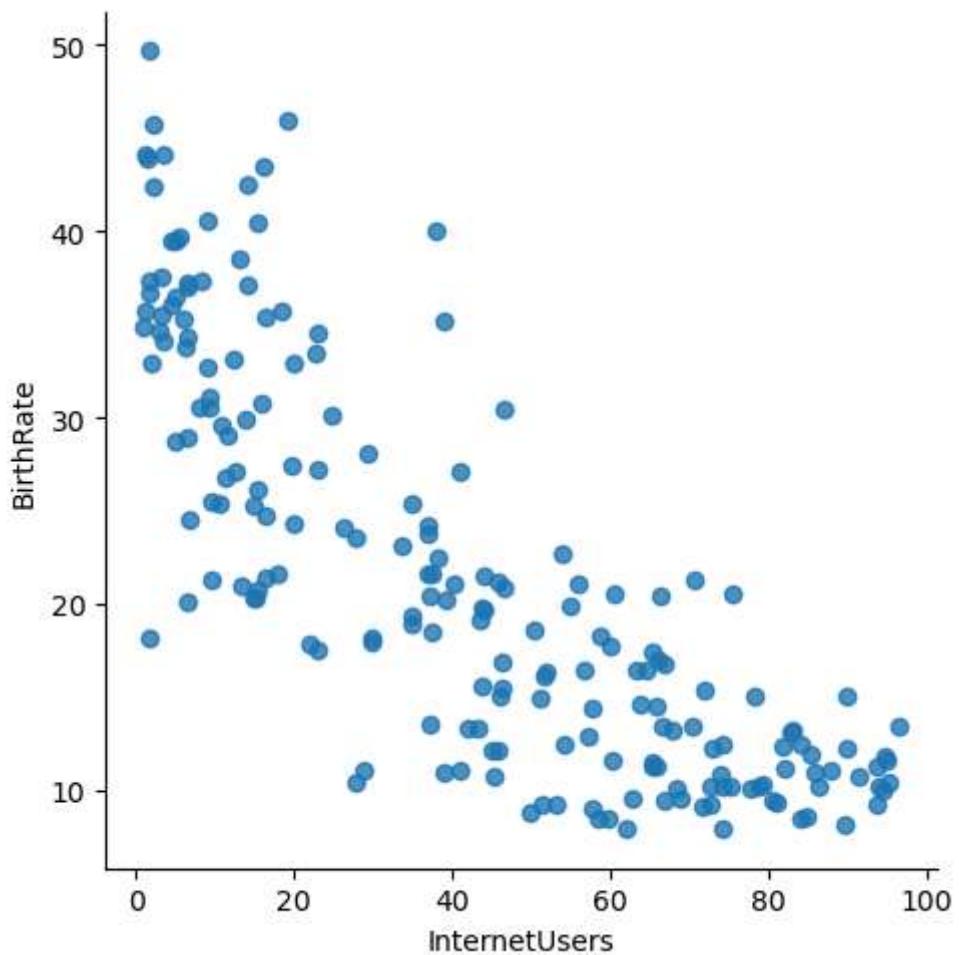
```
Out[126... <Axes: xlabel='InternetUsers', ylabel='Density'>
```



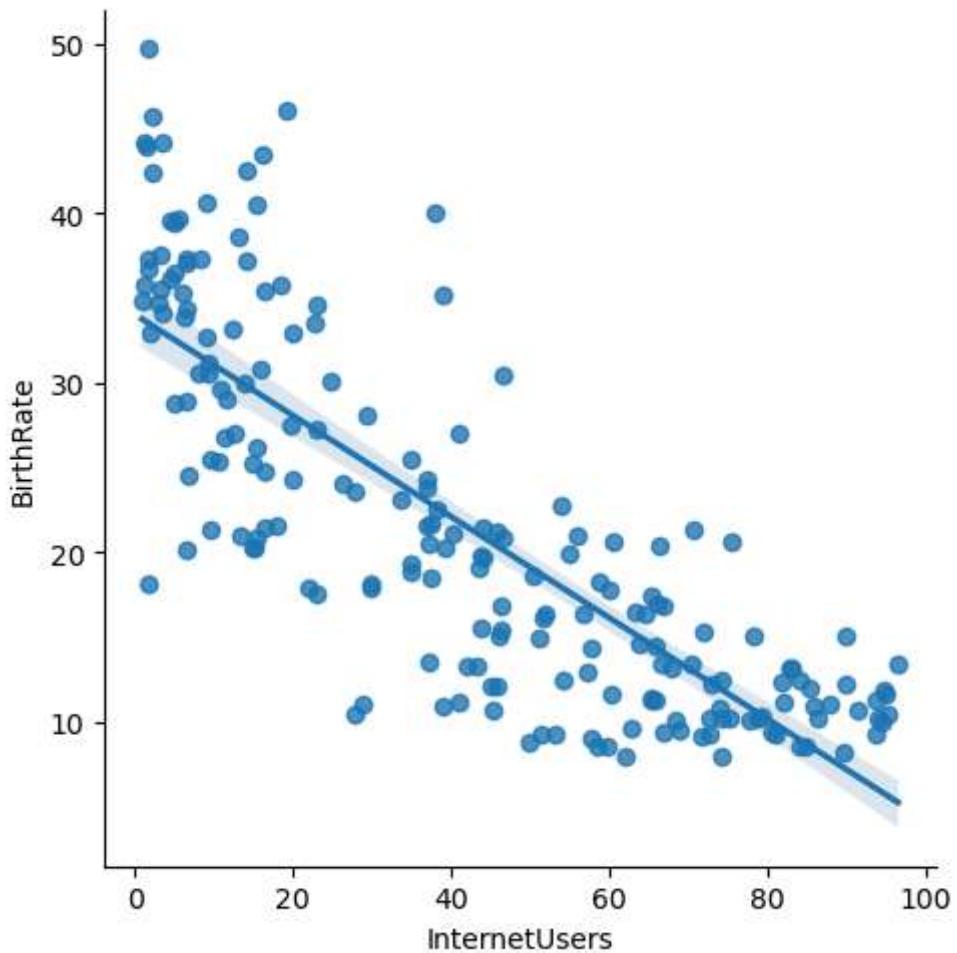
```
In [130]:  
vsi4=sns.boxplot(data=df,x='InternetUsers',y='BirthRate')  
plt.show()
```



```
In [133]:  
    vsi5=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',fit_reg=False)  
    plt.show()
```



```
In [135]: vis6=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',fit_reg=True)
```



In [142]: vis7

Out[142]: <seaborn.axisgrid.FacetGrid at 0x2043c83b4d0>

```
In [6]: import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

import warnings
warnings.filterwarnings('ignore')

%matplotlib inline
plt.rcParams['figure.figsize']=6,5
```

In [ ]: