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]:
```
type(df)
```

Out[6]:
```
pandas.core.frame.DataFrame
```

In [8]:
```
df.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 [10]:
```
df.columns
```

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

In [13]:
```
len(df.columns)
```

Out[13]:
```
5
```

In [16]:
```
df.head()
```

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

In [17]:
```
df.tail()
```

Out[17]:

	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 [18]:
```
df.tail(1)
```

Out[18]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
194	Zimbabwe	ZWE	35.715	18.5	Low income

In [21]:
```
df.head(2)
```

Out[21]:

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

In [22]:
```
df[::-1]
```

Out[22]:

	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 [23]:
```
df[:5]
```

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[5:]
```

Out[24]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
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
...	...	...	...	...	...
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

190 rows × 5 columns

In [25]:
```
df[:-5]
```

Out[25]:

	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
...	...	...	...	...	...
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 rows × 5 columns

In [26]:
```
df[::-5]
```

Out[26]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
194	Zimbabwe	ZWE	35.715	18.5000	Low income
189	Samoa	WSM	26.172	15.3000	Lower middle income
184	Venezuela, RB	VEN	19.842	54.9000	High income
179	Ukraine	UKR	11.100	41.0000	Lower middle income
174	Trinidad and Tobago	TTO	14.590	63.8000	High income
169	Thailand	THA	11.041	28.9400	Upper middle income
164	Swaziland	SWZ	30.093	24.7000	Lower middle income
159	Sao Tome and Principe	STP	34.537	23.0000	Lower middle income
154	Sierra Leone	SLE	36.729	1.7000	Low income
149	Saudi Arabia	SAU	20.576	60.5000	High income
144	French Polynesia	PYF	16.393	56.8000	High income
139	Papua New Guinea	PNG	28.899	6.5000	Lower middle income
134	Oman	OMN	20.419	66.4500	High income
129	Nicaragua	NIC	20.788	15.5000	Lower middle income
124	Malaysia	MYS	16.805	66.9700	Upper middle income
119	Mongolia	MNG	24.275	20.0000	Upper middle income
114	Macedonia, FYR	MKD	11.222	65.2400	Upper middle income
109	Morocco	MAR	21.023	56.0000	Lower middle income
104	Lesotho	LSO	28.738	5.0000	Lower middle income
99	Liberia	LBR	35.521	3.2000	Low income
94	Kiribati	KIR	29.044	11.5000	Lower middle income
89	Japan	JPN	8.200	89.7100	High income
84	Iceland	ISL	13.400	96.5468	High income

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
79	Indonesia	IDN	20.297	14.9400	Lower middle income
74	Hong Kong SAR, China	HKG	7.900	74.2000	High income
69	Grenada	GRD	19.334	35.0000	Upper middle income
64	Guinea	GIN	37.337	1.6000	Low income
59	Micronesia, Fed. Sts.	FSM	23.511	27.8000	Lower middle income
54	Estonia	EST	10.300	79.4000	High income
49	Algeria	DZA	24.738	16.5000	Upper middle income
44	Czech Republic	CZE	10.200	74.1104	High income
39	Cabo Verde	CPV	21.625	37.5000	Lower middle income
34	Cote d'Ivoire	CIV	37.320	8.4000	Lower middle income
29	Central African Republic	CAF	34.076	3.5000	Low income
24	Brazil	BRA	14.931	51.0400	Upper middle income
19	Bosnia and Herzegovina	BIH	9.062	57.7900	Upper middle income
14	Burkina Faso	BFA	40.551	9.1000	Low income
9	Austria	AUT	9.400	80.6188	High income
4	United Arab Emirates	ARE	11.044	88.0000	High income

In [27]:
```
df.describe()
```

Out[27]:

	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 [28]:
```
df.describe().transpose() # converts ros to columns
```

Out[28]:

	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 [29]:
```
df.columns
```

Out[29]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [30]:
```
df.columns = ['a', 'b', 'c', 'd', 'e']
```

In [31]:
```
df.columns
```

Out[31]:
```
Index(['a', 'b', 'c', 'd', 'e'], dtype='object')
```

In [32]:
```
df.columns = ['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup',]
```

In [33]:
```
df.columns
```

Out[33]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [34]:
```
df[:]
```

Out[34]:

	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 [35]:
```
df[0:5]
```

Out[35]:

	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 [36]:
```
df[0:9]
```

Out[36]:

	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
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
8	Australia	AUS	13.200	83.0	High income

In [37]:
```
df[-1:-9]
```

Out[37]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup

In [38]:
```
df[['CountryName','CountryCode','BirthRate']]
```

Out[38]:

	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 [39]:
```
df.isnull()
```

Out[39]:

	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 [41]:
```
df.sum()
```

Out[41]:
```
CountryName      ArubaAfghanistanAngolaAlbaniaUnited Arab Emira...
CountryCode      ABWAFGAGOALBAREARGARMATGAUSAUTAZEBDIBELBENBFAB...
BirthRate                                                4186.636
InternetUsers                                           8204.911824
IncomeGroup      High incomeLow incomeUpper middle incomeUpper ...
dtype: object
```

In [43]:
```
df.isnull.sum()
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[43], line 1
----> 1 df.isnull.sum()

AttributeError: 'function' object has no attribute 'sum'
```

In [48]:
```
df.dtypes
```

Out[48]:
```
CountryName       object
CountryCode       object
BirthRate        float64
InternetUsers    float64
IncomeGroup       object
dtype: object
```

In [50]:
```
df.columns
```

Out[50]:
```
Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
       'IncomeGroup'],
      dtype='object')
```

In [80]:
```
df_categorical = df[['CountryName','CountryCode','IncomeGroup']]
df_categorical
```

Out[80]:

	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 [56]:
```
df[['CountryName','BirthRate']].head()
```

Out[56]:

	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 [58]:
```
df.tail()
```

Out[58]:

	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 [60]:
```
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 [62]:
```
df['myCalc'] = df.BirthRate * df.InternetUsers
```

In [64]:
```
df.head()
```

Out[64]:

	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 [66]:
```
df.drop("myCalc",axis = 1)
```

Out[66]:

	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 [82]:
```
df.describe()
```

Out[82]:

	BirthRate	InternetUsers	myCalc
count	195.000000	195.000000	195.000000
mean	21.469928	42.076471	653.559009
std	10.605467	29.030788	351.553521
min	7.900000	0.900000	28.990400
25%	12.120500	14.520000	361.263300
50%	19.680000	41.000000	682.074300
75%	29.759500	66.225000	892.690170
max	49.661000	96.546800	1552.589500

In [84]:
```
df_categorical
```

Out[84]:

	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 [88]:
```
df_categorical.head()
```

Out[88]:

	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

Seaborn

In [70]:
```
# Introduction to seaborn # seaborn is very powerfull visualizatio(STATISTIC VISULA

import matplotlib.pyplot as plt # visulaiztion
import seaborn as sns # distribution visualtion
# seaborn are used for advance visualization e.x --> distribution plot, line plot

%matplotlib inline
plt.rcParams['figure.figsize'] = 6,2

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

In [90]:
```
df.head()
```

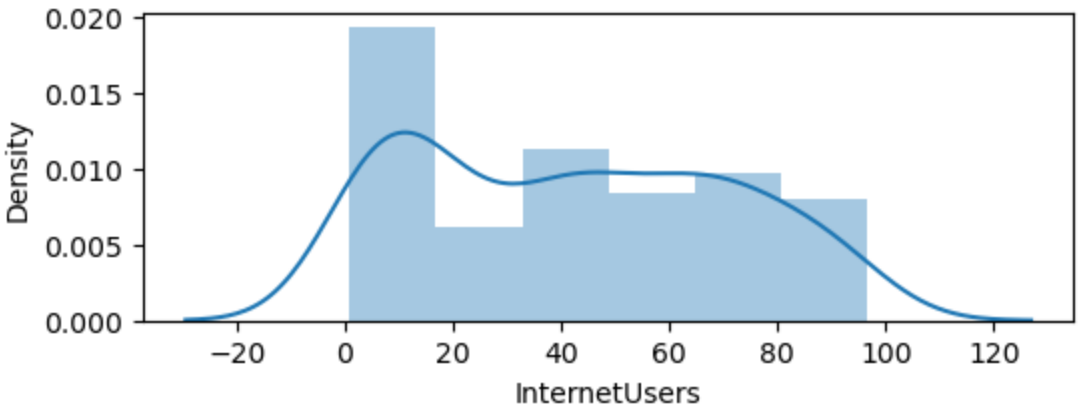
Out[90]:

	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

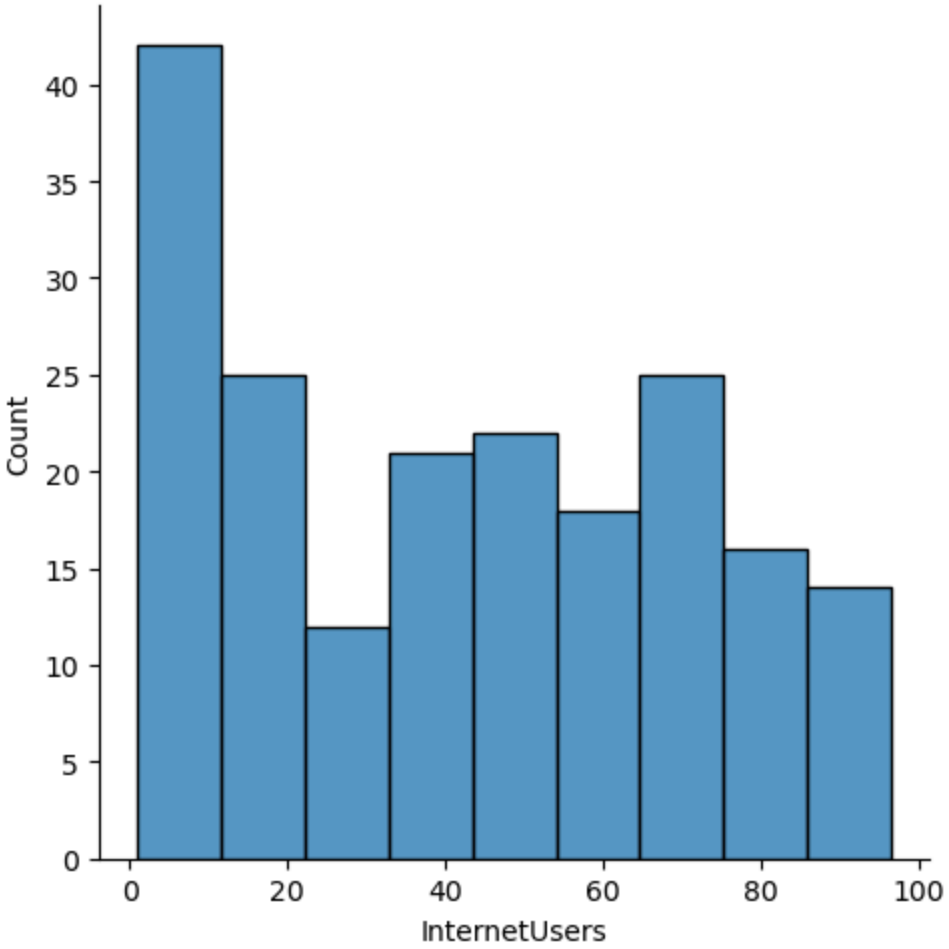
In [72]:
```
df['InternetUsers']
```

Out[72]:
```
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
```

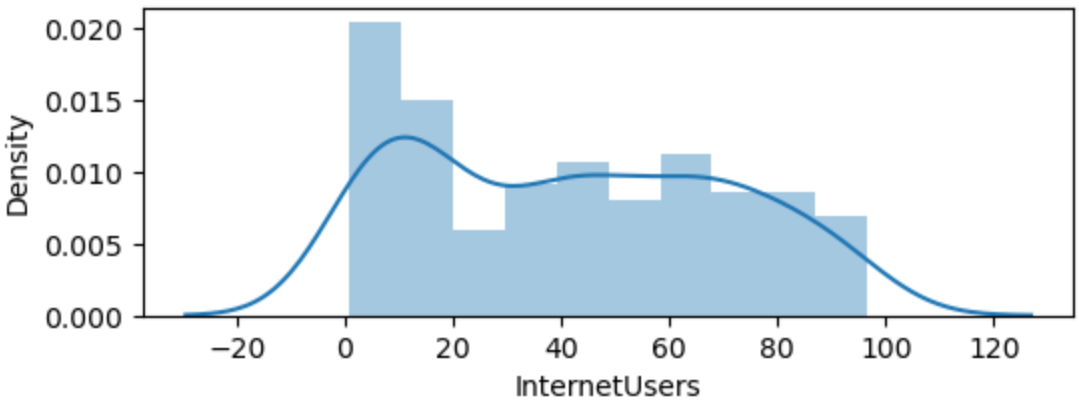
In [73]:
```
vis1 = sns.distplot(df['InternetUsers'])
```



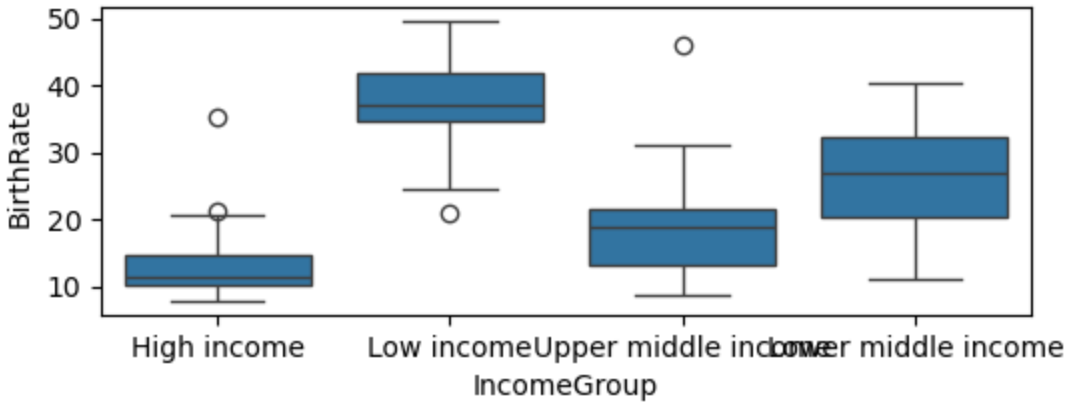
In [74]:
```
vis2 = sns.displot(df['InternetUsers'])
```



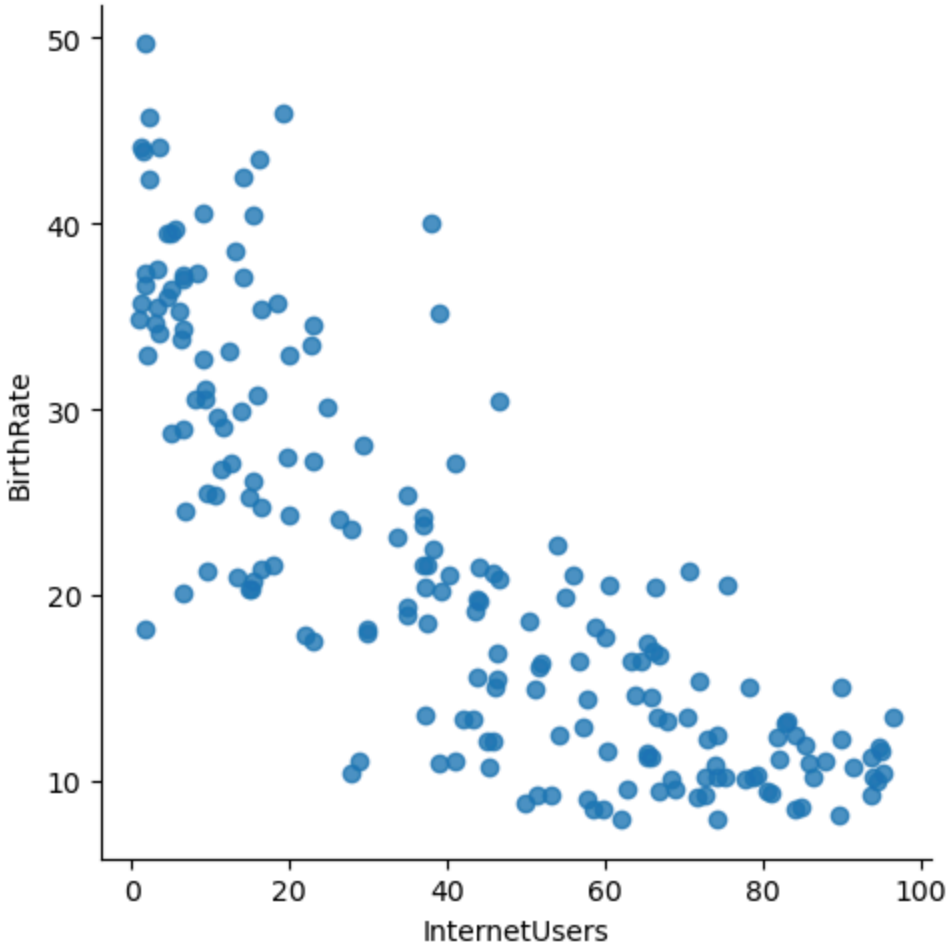
In [80]:
```
vis3 = sns.distplot(df["InternetUsers"], bins = 10)
```



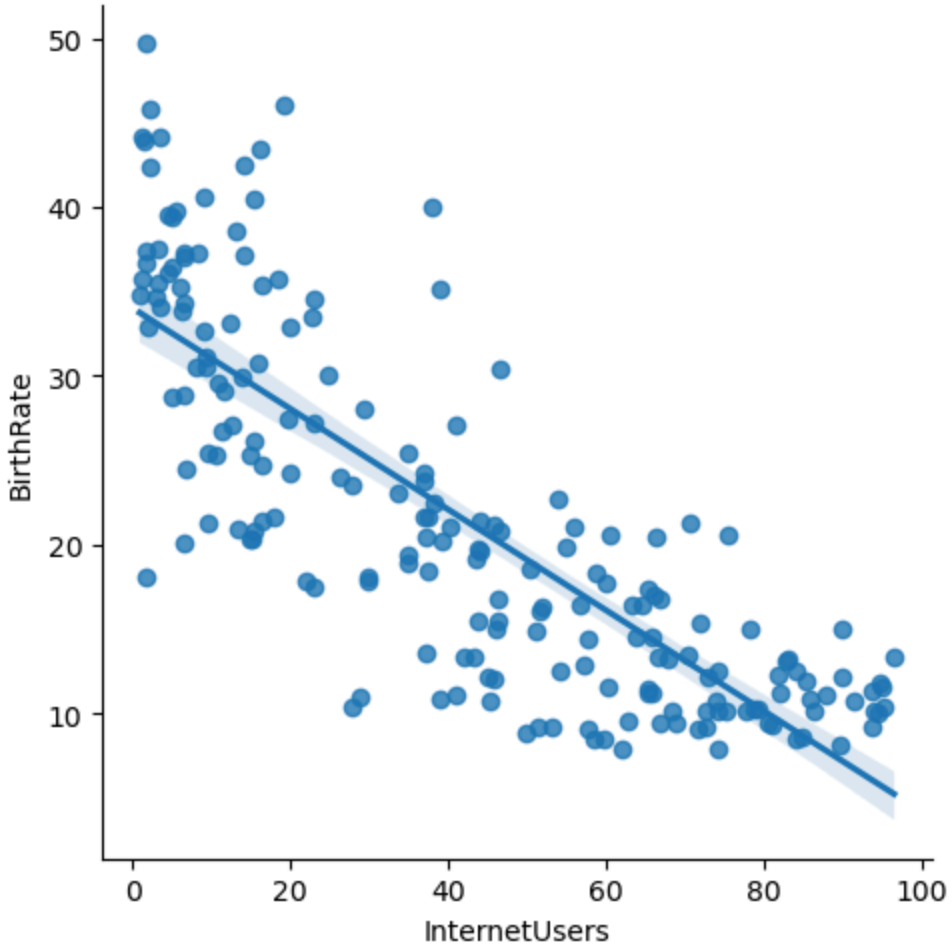
In [153…
```
vis4 = sns.boxplot(data = df, x = "IncomeGroup", y = 'BirthRate')
```



In [155…
```
vis5 = sns.lmplot(data = df, x = 'InternetUsers', y = 'BirthRate', fit_reg = False)
```

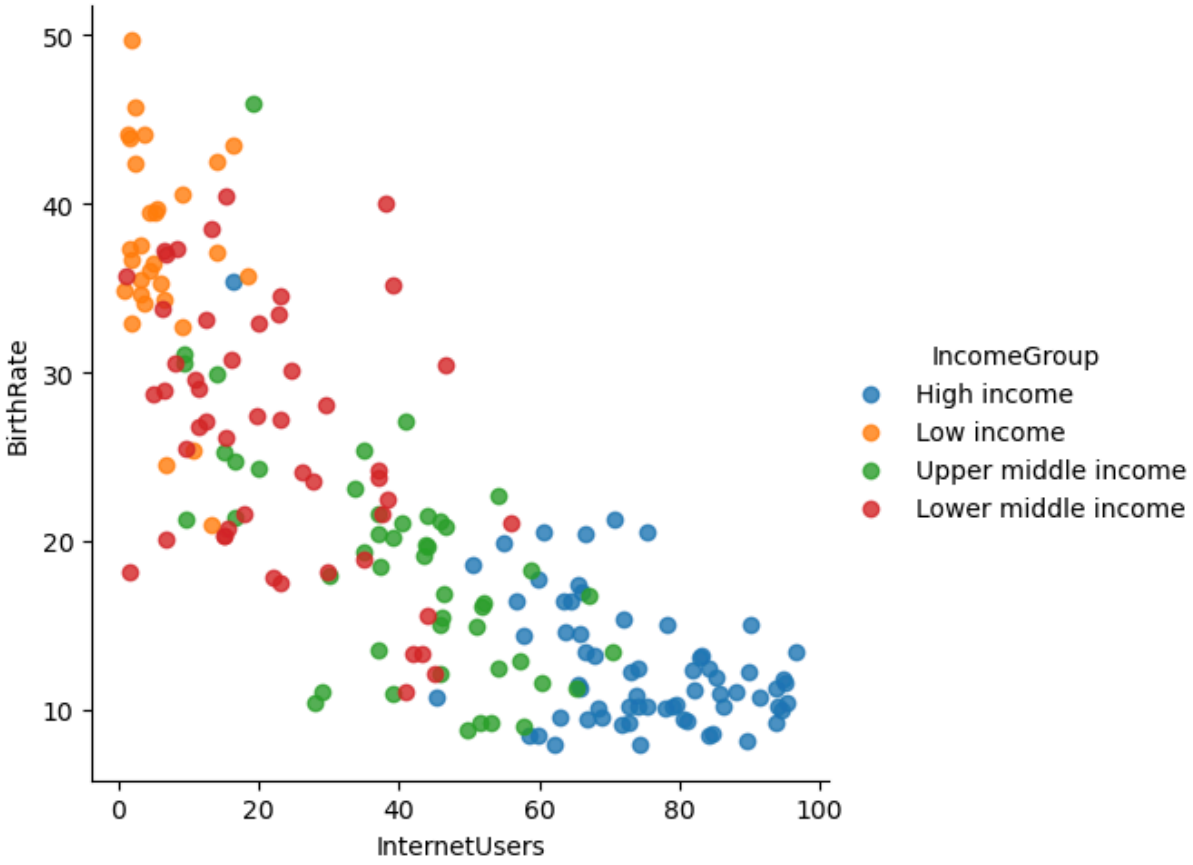


In [157…
```
vis6 = sns.lmplot(data = df,x = 'InternetUsers', y = 'BirthRate')
```



In [159…

```
vis7 = sns.lmplot(data = df, x = 'InternetUsers', y = 'BirthRate', fit_reg = False,
```



In [92]:
```
df["myCalc"]
```

Out[92]:
```
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
Name: myCalc, Length: 195, dtype: float64
```

In [94]:
```
df.head()
```

Out[94]:

	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 [107…

```
df.drop("myCalc",axis = 1)
```

Out[107…

	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 [103…

```
df
```

Out[103…

	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 [109…
```
df.columns[2]
```

Out[109…
```
'BirthRate'
```

In [111…
```
df.isna()
```

Out[111…

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

195 rows × 6 columns

In [115…
```
df.InternetUsers < 2
```

Out[115…
```
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 [119…
```
Filter = df.InternetUsers < 2
Filter
```

Out[119…
```
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 [121…
```
df[3:7]
```

Out[121…

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup	myCalc
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

In [123…
```
df[Filter]
```

Out[123…

	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 [125…
```
len(df[Filter])
```

Out[125… 9

In [127…
```
df.BirthRate>40
```

Out[127…
```
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 [129…
```
F2 = df.BirthRate>40
F2
```

Out[129…
```
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 [131…
```
Fdf[F2]
```

Out[131…

	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 [133…
```
len(df[F2])
```

Out[133… 12

In [135…
```
Filter & F2
```

Out[135…
```
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 [137…
```
df[Filter & F2]
```

Out[137…

	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 [143…

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

Out[143…

	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 [145…

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

Out[145...

	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 [147…
```
len(df[df.IncomeGroup == 'Low income'])
```

Out[147…
```
30
```

In [149…
```
df.IncomeGroup.unique()
```

Out[149…
```
array(['High income', 'Low income', 'Upper middle income',
       'Lower middle income'], dtype=object)
```

In [ ]:
```
```