In [2]:
```python
import seaborn as sns
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
import warnings
warnings.filterwarnings("ignore")
```

In [4]:
```python
gdp = pd.read_csv(r"C:\Users\chait\Desktop\AI_ML_Monty_Classes\1st, 2nd\1st, 2
```

In [5]:
```python
gdp
```

Out[5]:

	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 [6]:
```python
gdp.head(10)
```

Out[6]:

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

In [8]: `gdp.tail(10)`

Out[8]:

	CountryName	CountryCode	BirthRate	InternetUsers	IncomeGroup
185	Virgin Islands (U.S.)	VIR	10.700	45.3	High income
186	Vietnam	VNM	15.537	43.9	Lower middle income
187	Vanuatu	VUT	26.739	11.3	Lower middle income
188	West Bank and Gaza	PSE	30.394	46.6	Lower middle income
189	Samoa	WSM	26.172	15.3	Lower middle income
190	Yemen, Rep.	YEM	32.947	20.0	Lower middle income
191	South Africa	ZAF	20.850	46.5	Upper middle income
192	Congo, Dem. Rep.	COD	42.394	2.2	Low income
193	Zambia	ZMB	40.471	15.4	Lower middle income
194	Zimbabwe	ZWE	35.715	18.5	Low income

In [9]: `gdp[::-1]`

Out[9]:

	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 [10]: `gdp.describe()`

Out[10]:

	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 [12]: `gdp.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 [13]: `gdp_num= gdp.describe()`

In [14]: `gdp_num`

Out[14]:

	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 [15]: ```python
sns.distplot(gdp_num)
```

Out[15]: <AxesSubplot:ylabel='Density'>



In [18]: ```python
numgdp = pd.DataFrame(gdp,columns=["BirthRate","InternetUsers"])
```
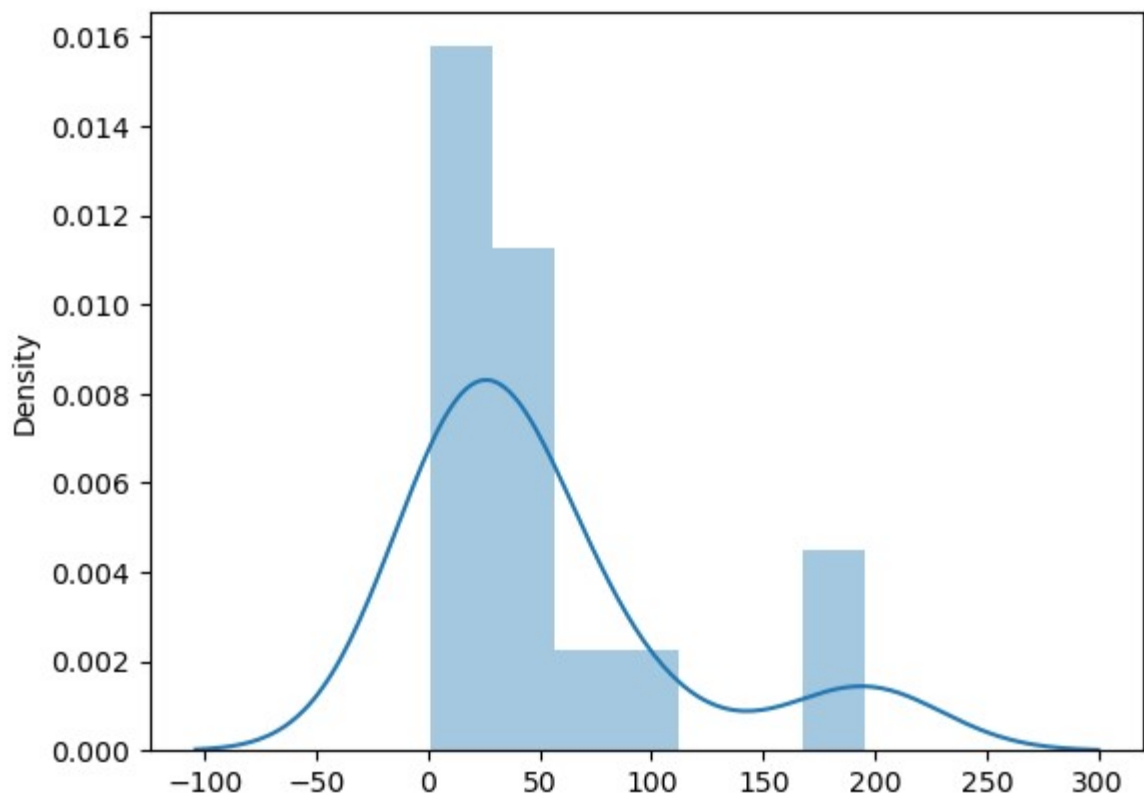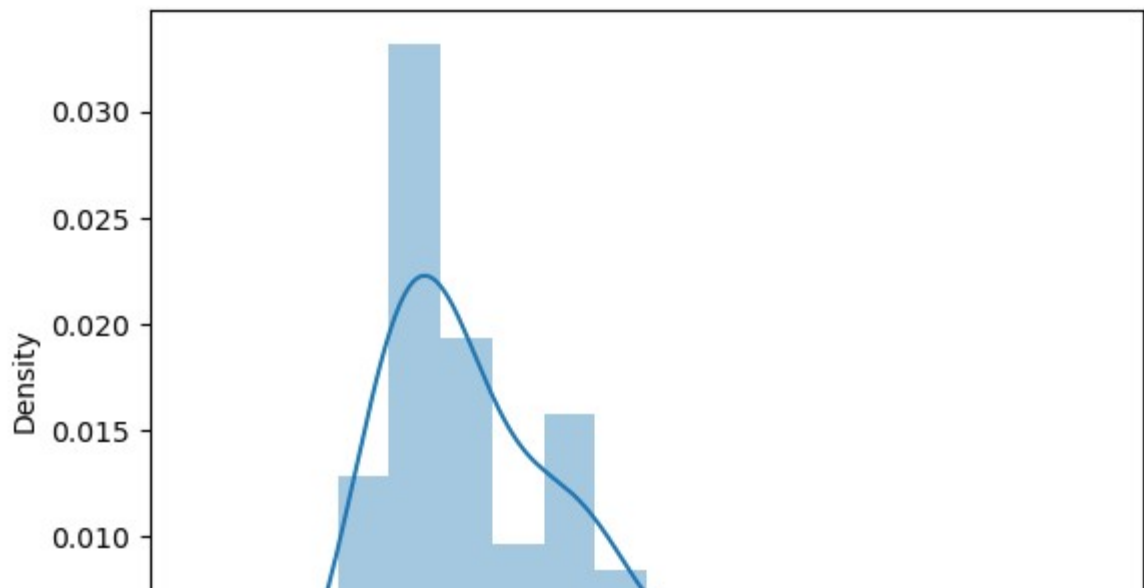
In [19]: ```python
numgdp
```

Out[19]:

|     | 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 [20]: `sns.distplot(numgdp)`

Out[20]: `<AxesSubplot:ylabel='Density'>`



In [33]: `plt.plot(numgdp.head(10))`

Out[33]: `[<matplotlib.lines.Line2D at 0x245b45d3850>,`
`<matplotlib.lines.Line2D at 0x245b45d38b0>]`

```
In [27]: plt.plot(numgdp["InternetUsers"].head(10))
         plt.xlabel("Entry Number")
         plt.ylabel("Rating")
         plt.title("InternetUsers")
```

Out[27]: Text(0.5, 1.0, 'InternetUsers')

In [99]:
```python
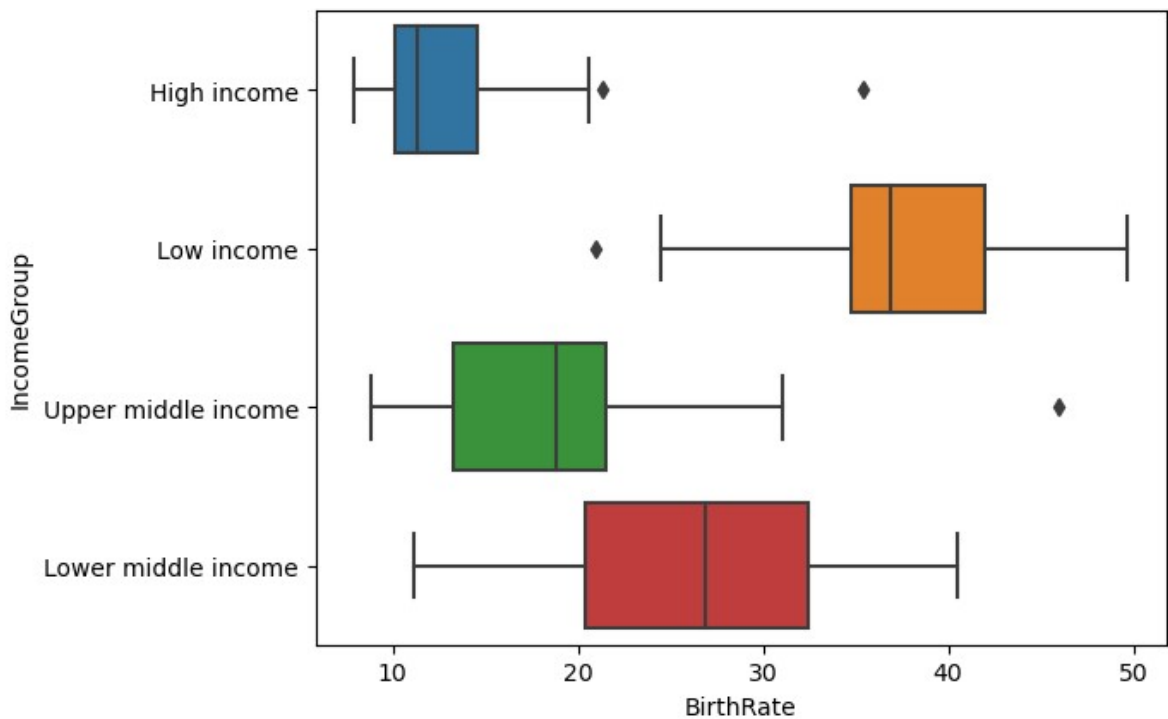plt.plot(numgdp["BirthRate"].head(10))
plt.xlabel("Entry Number")
plt.ylabel("Rating")
plt.title("BirthRate")
```
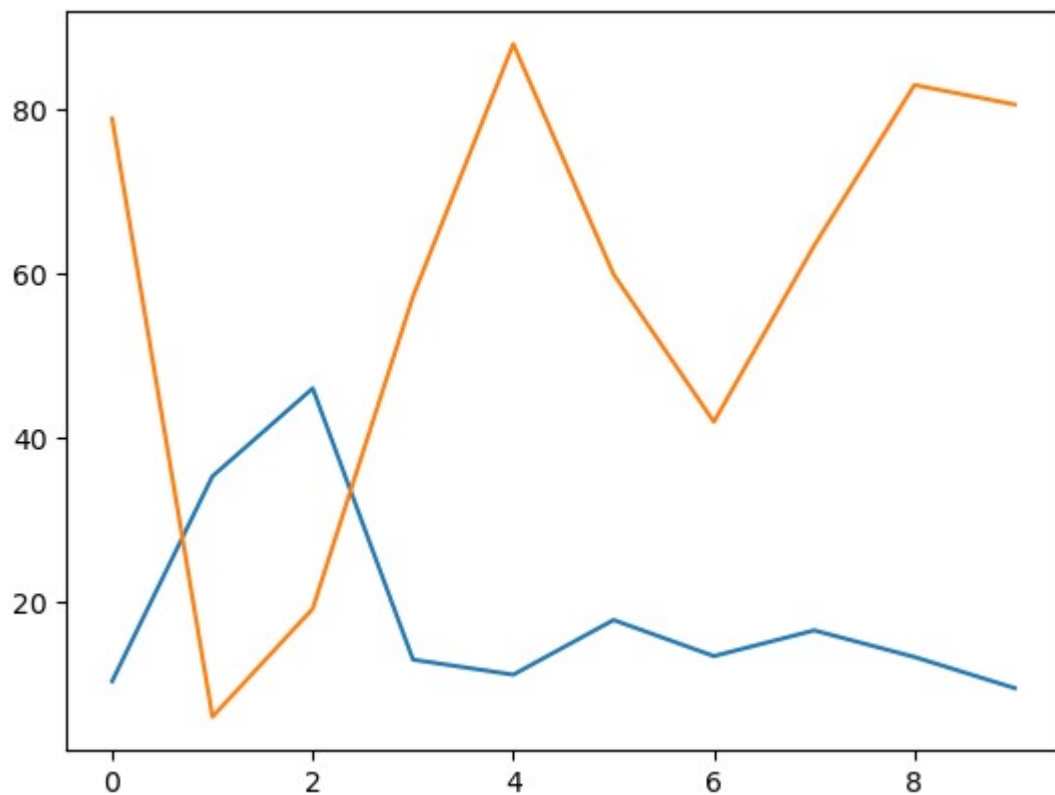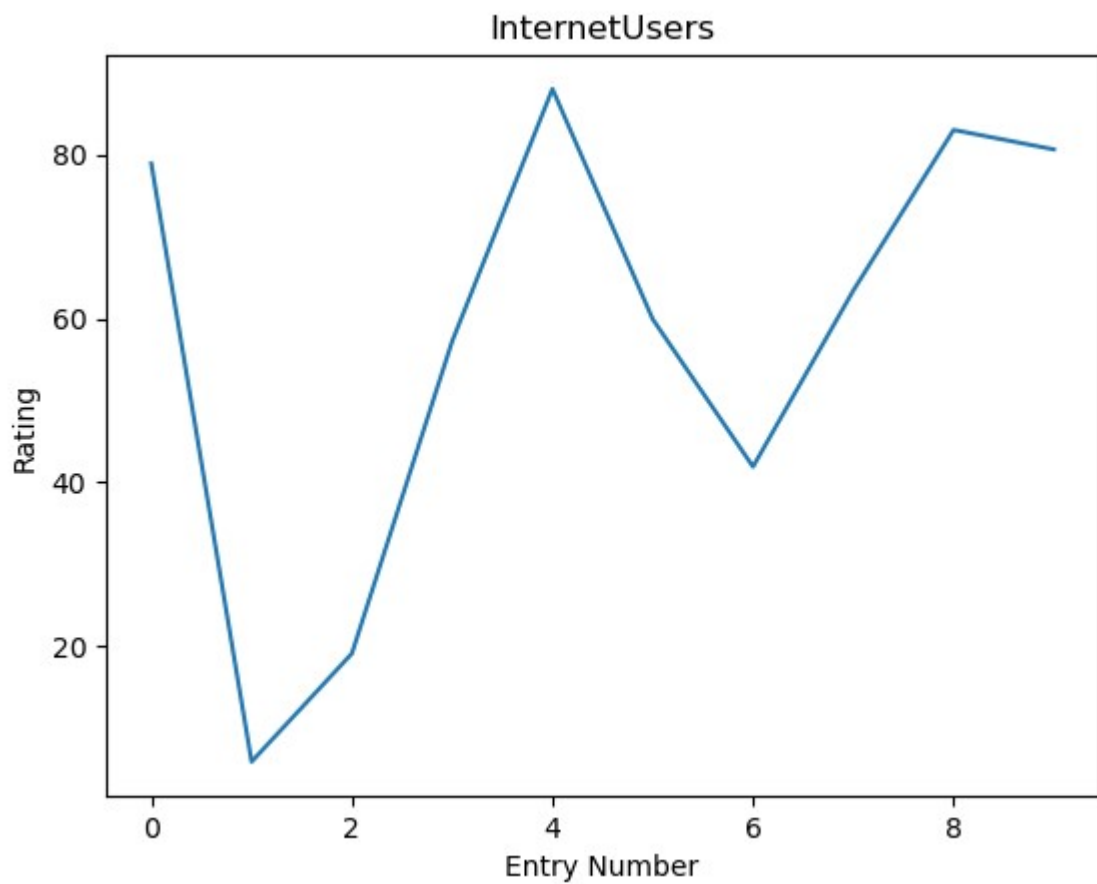
Out[99]: Text(0.5, 1.0, 'BirthRate')
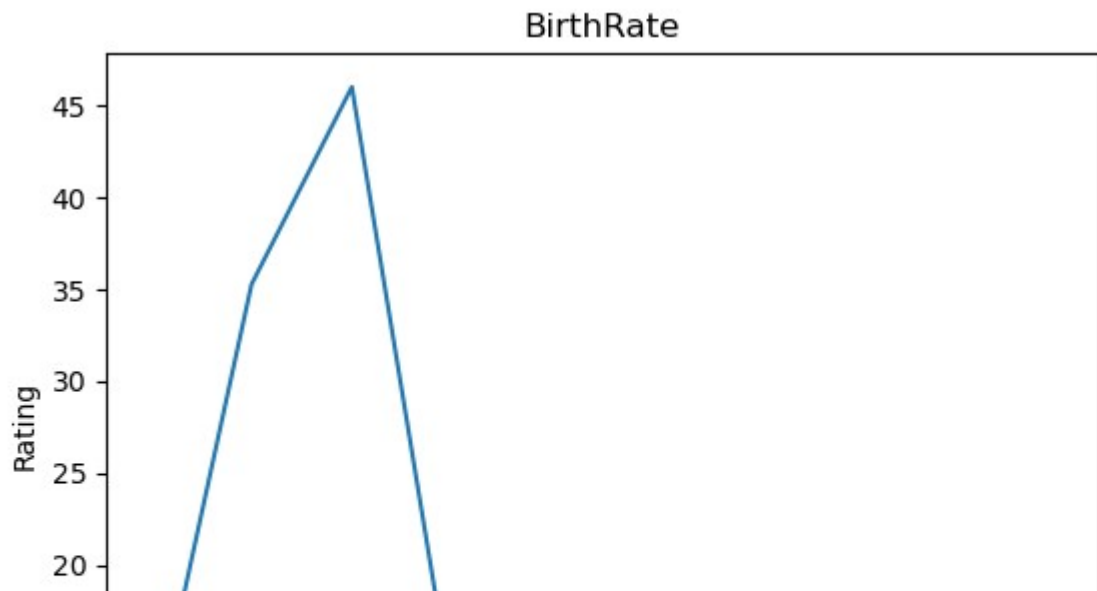
In [38]:
```python
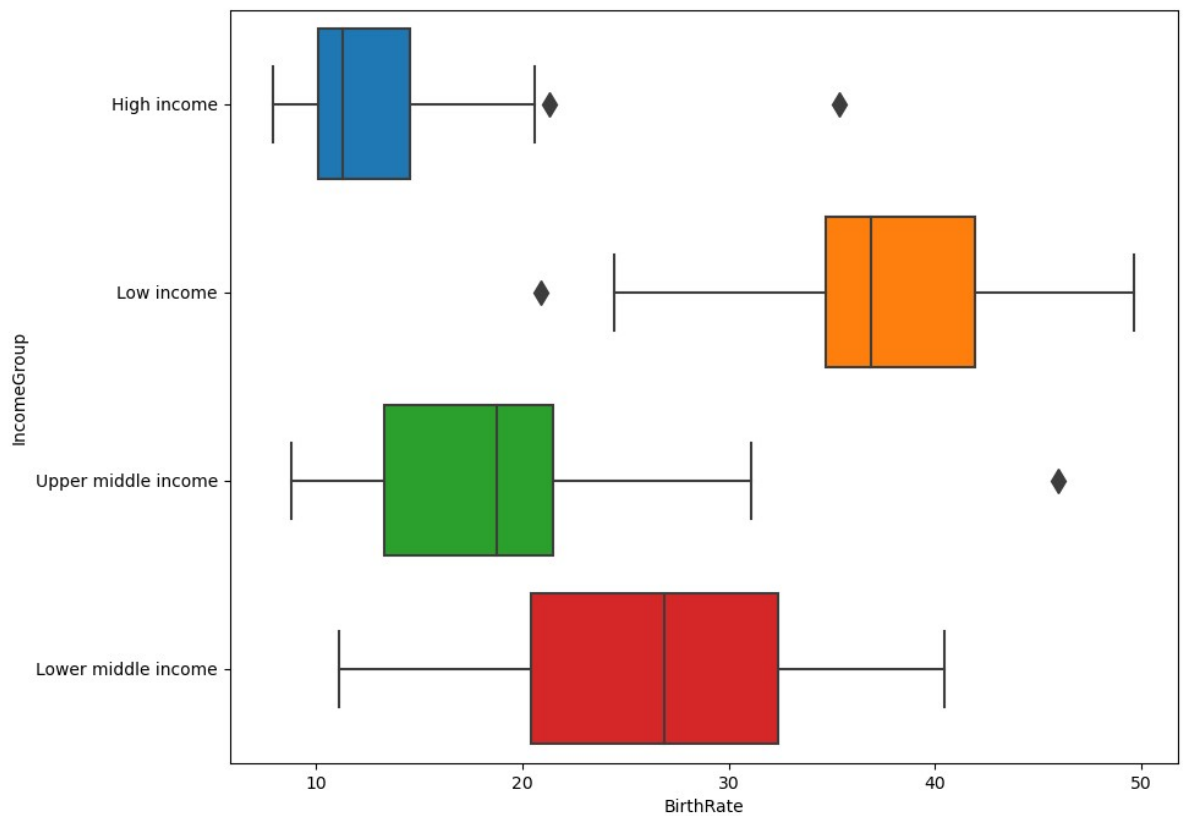sns.boxplot(data = gdp, x="BirthRate", y="IncomeGroup" )
```

Out[38]: <AxesSubplot:xlabel='BirthRate', ylabel='IncomeGroup'>

In [82]:
```python
plt.figure(figsize=(10,8))
sns.boxplot(data = gdp, x="IncomeGroup", y="InternetUsers",orient = "v")
```

Out[82]: <AxesSubplot:xlabel='IncomeGroup', ylabel='InternetUsers'>
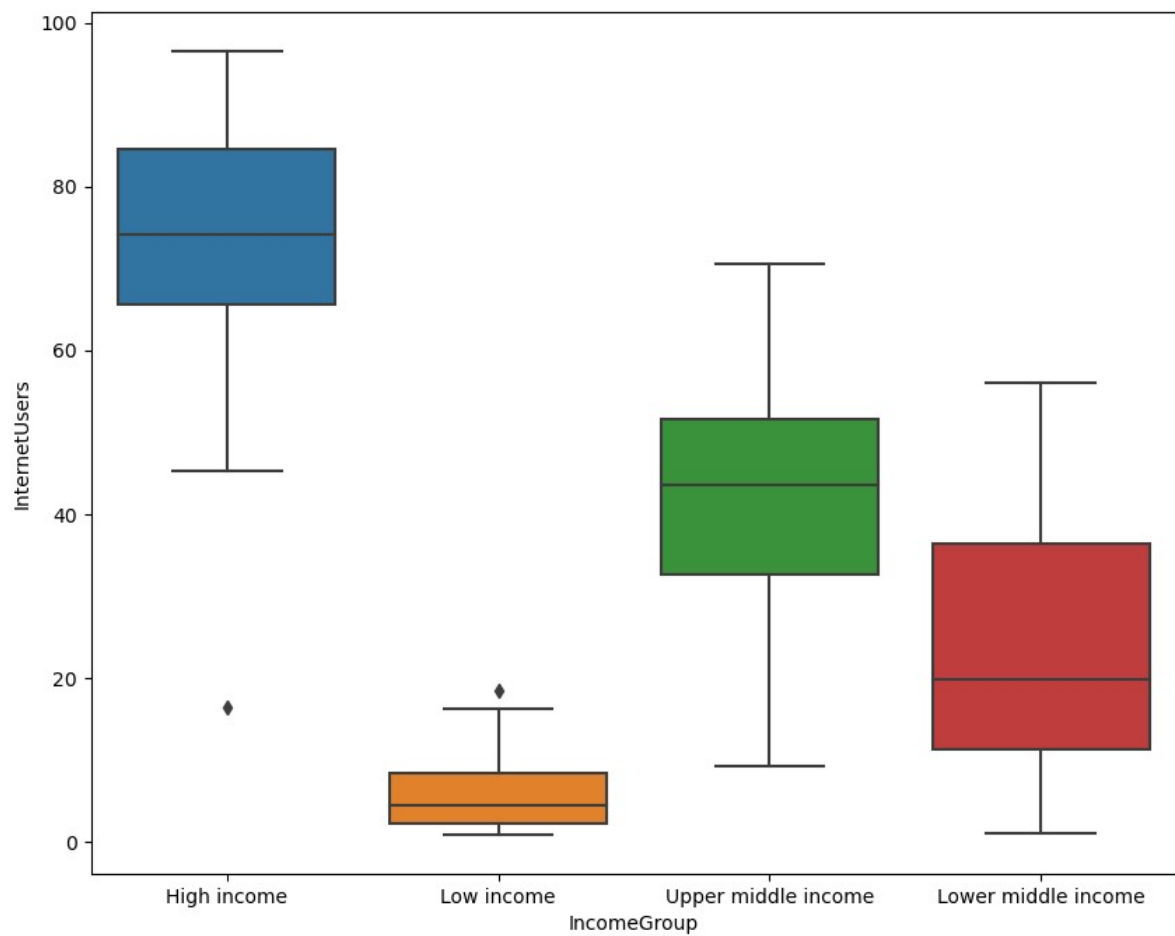
In [106]:
```python
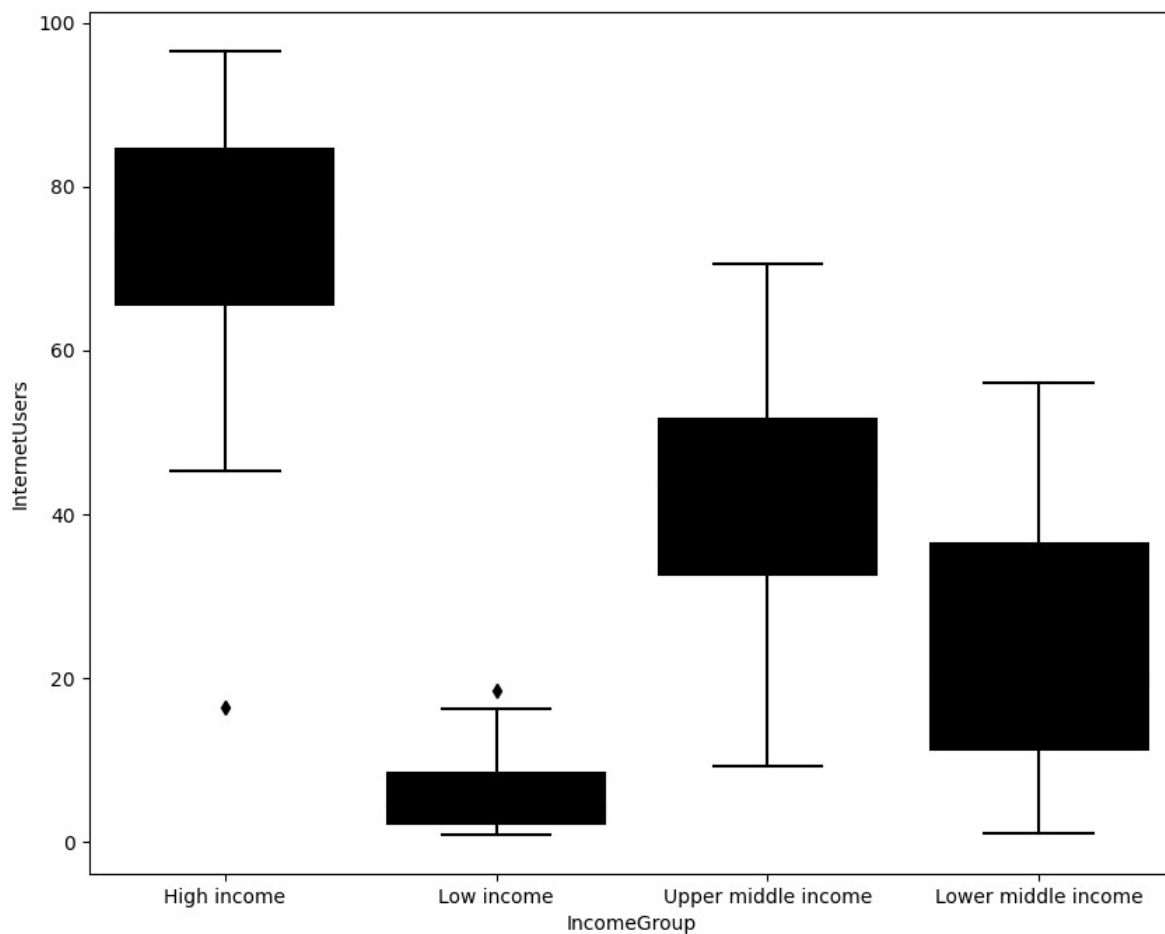plt.figure(figsize=(10,8))
sns.boxplot(data = gdp,x ="BirthRate", y="IncomeGroup",orient = "h",saturation
```

Out[106]: <AxesSubplot:xlabel='BirthRate', ylabel='IncomeGroup'>

In [104]:
```python
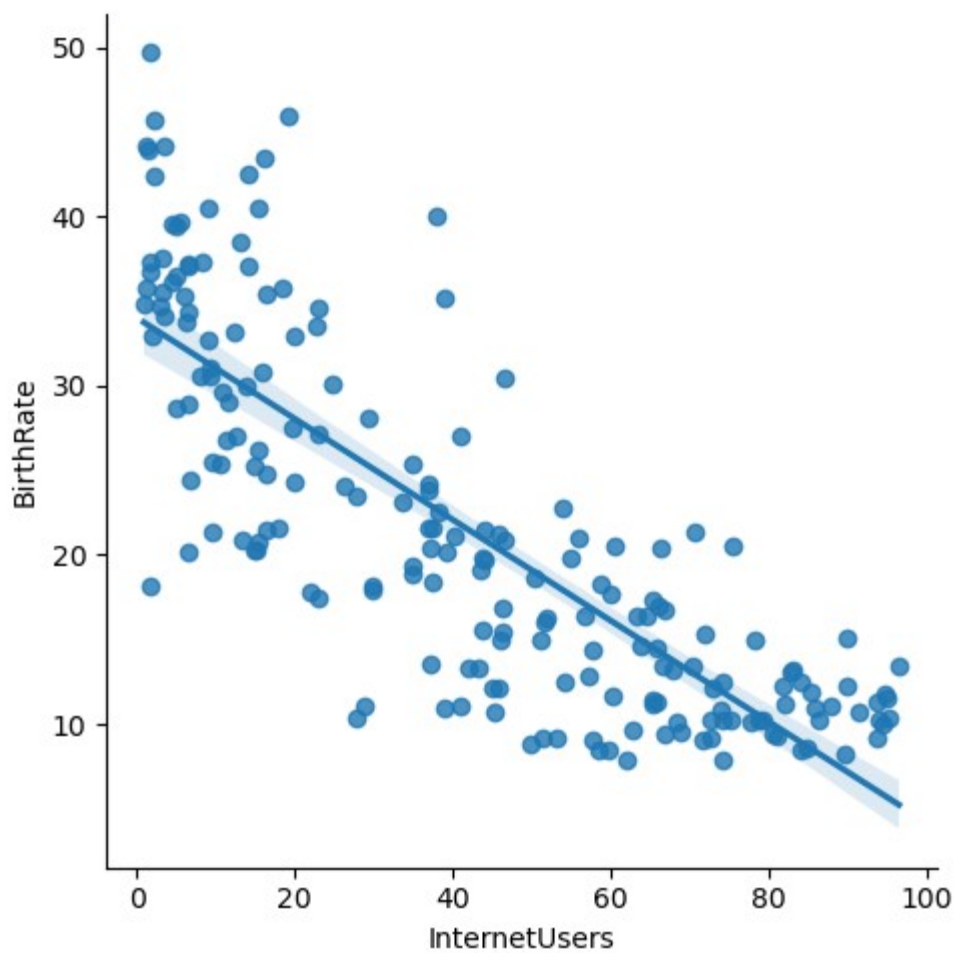plt.figure(figsize=(10,8))
sns.boxplot(data = gdp, x="IncomeGroup", y="InternetUsers",orient = "v",color=
```

Out[104]: <AxesSubplot:xlabel='IncomeGroup', ylabel='InternetUsers'>

In [56]: `sns.lmplot(data = gdp, x="InternetUsers",y="BirthRate")`

Out[56]: `<seaborn.axisgrid.FacetGrid at 0x245b96b49a0>`

In [117]: `sns.lmplot(data=gdp, x="BirthRate",y="InternetUsers", fit_reg =False)`

Out[117]: `<seaborn.axisgrid.FacetGrid at 0x245c5b9bdf0>`
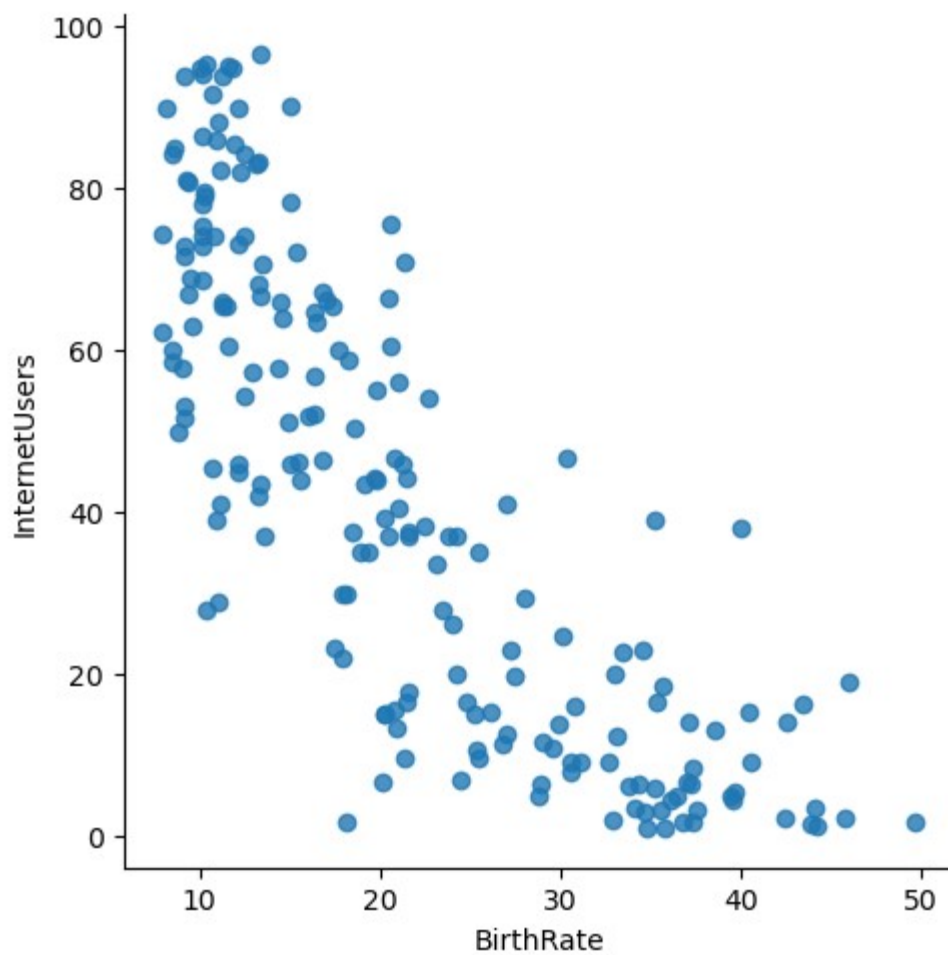
In [109]: `sns.lmplot(data=gdp, x="BirthRate",y="InternetUsers", hue="IncomeGroup",fit_re`

Out[109]: `<seaborn.axisgrid.FacetGrid at 0x245c40bff70>`
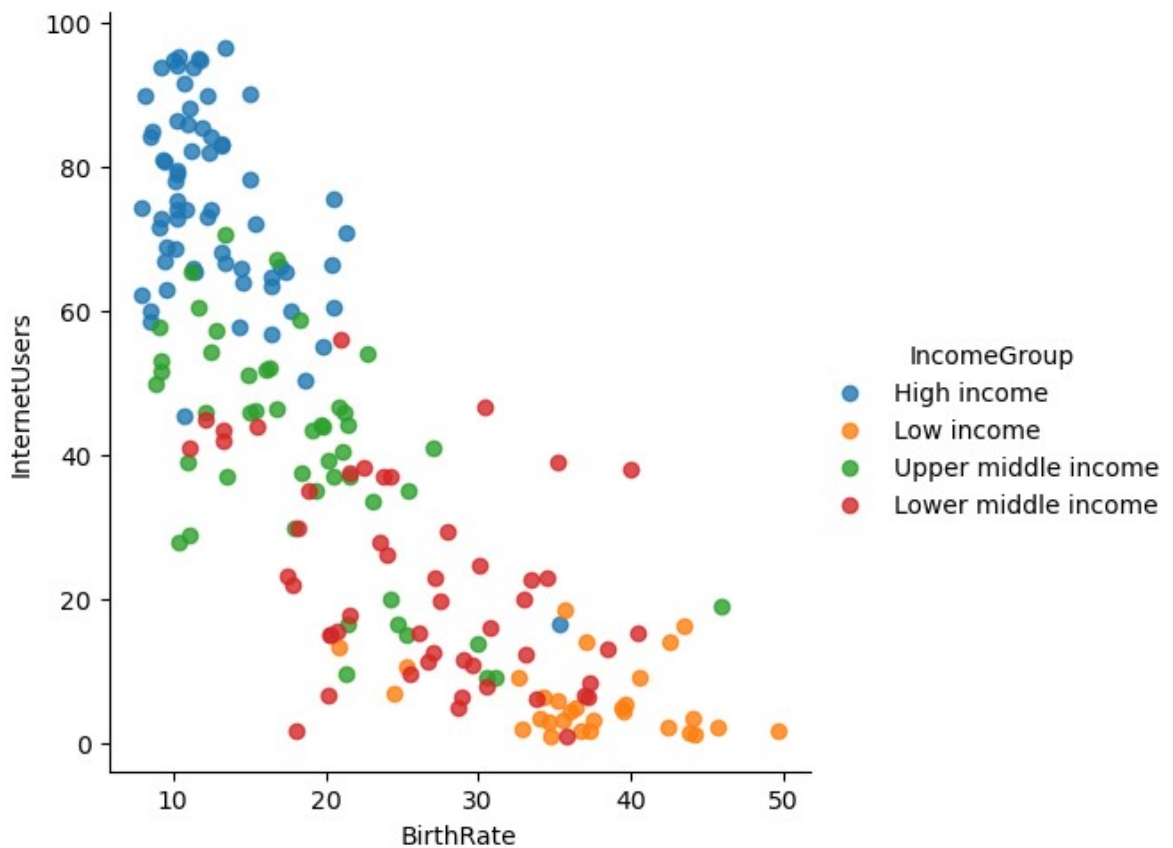
In [120]: `gdp`

Out[120]:

	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 [123]: `gdp_num`

Out[123]:

	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 [125]: `sns.heatmap(data = gdp_num, annot=True)`

Out[125]: `<AxesSubplot:>`
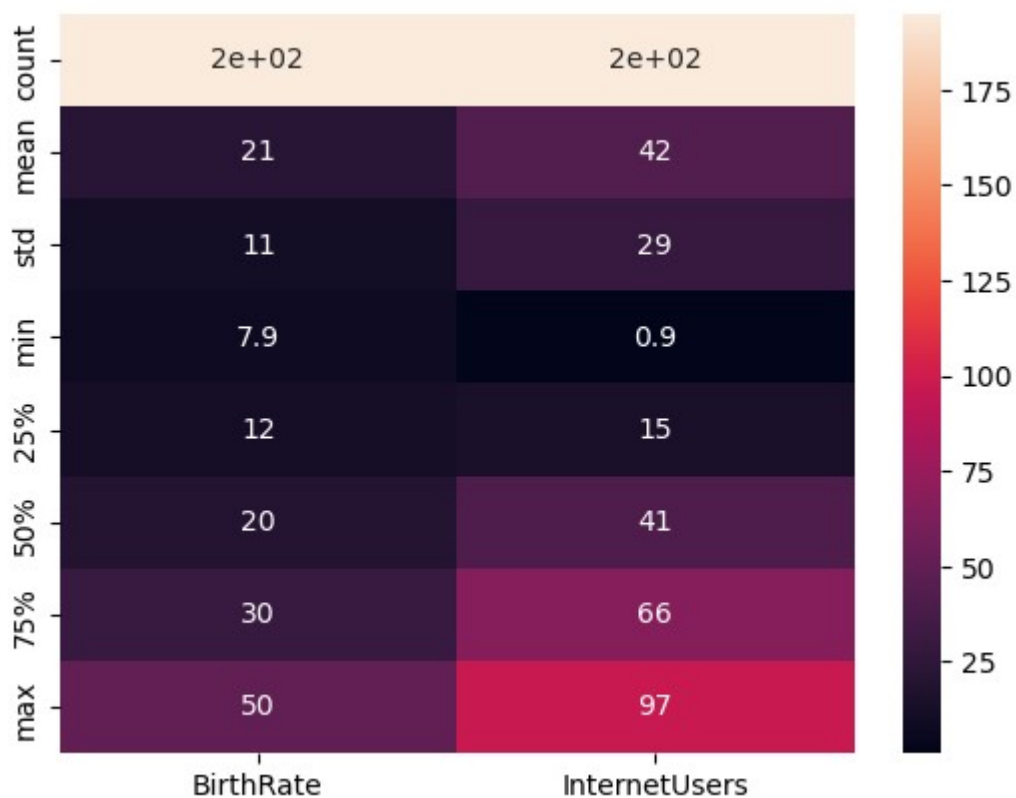
In [127]: `gdp_2 = pd.DataFrame(gdp,columns=["InternetUsers","BirthRate"])`

In [128]: `gdp_2`

Out[128]:

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

195 rows × 2 columns

In [140]: `sns.heatmap(data = gdp_2.head(10), center=1,annot=True)`

Out[140]: `<AxesSubplot:>`