```
import pandas as pd
In [1]:
         df=pd.read_csv(r"C:\Users\Admin\Downloads\data.csv")
In [2]:
In [3]:
         df
Out[3]:
                   CountryName CountryCode
                                                BirthRate InternetUsers
                                                                               IncomeGroup
           0
                           Aruba
                                          ABW
                                                    10.244
                                                                    78.9
                                                                                 High income
                      Afghanistan
                                           AFG
                                                    35.253
                                                                      5.9
                                                                                  Low income
                                                                                Upper middle
           2
                          Angola
                                          AGO
                                                    45.985
                                                                    19.1
                                                                                      income
                                                                                Upper middle
           3
                          Albania
                                           ALB
                                                    12.877
                                                                    57.2
                                                                                      income
                      United Arab
                                           ARE
                                                    11.044
                                                                    88.0
                                                                                 High income
            4
                         Emirates
                                                                                Lower middle
         190
                      Yemen, Rep.
                                           YEM
                                                    32.947
                                                                    20.0
                                                                                      income
                                                                                Upper middle
         191
                      South Africa
                                           ZAF
                                                    20.850
                                                                    46.5
                                                                                      income
         192
                Congo, Dem. Rep.
                                           COD
                                                    42.394
                                                                      2.2
                                                                                  Low income
                                                                                Lower middle
         193
                          Zambia
                                          ZMB
                                                    40.471
                                                                    15.4
                                                                                      income
                       Zimbabwe
                                                                                  Low income
         194
                                           ZWE
                                                    35.715
                                                                    18.5
        195 rows × 5 columns
In [4]:
         len(df)
Out[4]:
In [5]:
         df.shape
Out[5]:
         (195, 5)
In [6]:
         df.columns
         Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
Out[6]:
                 'IncomeGroup'],
                dtype='object')
         type(df)
In [7]:
         pandas.core.frame.DataFrame
Out[7]:
In [8]:
```

| Out[8]: |     | 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<br>income |
|         | 3   | Albania                 | ALB         | 12.877    | 57.2          | Upper middle income    |
|         | 4   | United Arab<br>Emirates | ARE         | 11.044    | 88.0          | High income            |
|         | ••• |                         |             |           | <b></b>       |                        |
|         | 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 [9]: df.info

```
Out[9]: <bound method DataFrame.info of
                                                        CountryName CountryCode BirthRat
            InternetUsers \
         e
         0
                                            ABW
                                                    10.244
                                                                      78.9
                              Aruba
                                            AFG
         1
                       Afghanistan
                                                    35.253
                                                                       5.9
         2
                            Angola
                                            AG0
                                                    45.985
                                                                      19.1
         3
                           Albania
                                            ALB
                                                    12.877
                                                                      57.2
         4
              United Arab Emirates
                                            ARE
                                                    11.044
                                                                      88.0
                                            . . .
                                                       . . .
                                                                       . . .
         190
                       Yemen, Rep.
                                            YEM
                                                    32.947
                                                                      20.0
         191
                      South Africa
                                            ZAF
                                                    20.850
                                                                      46.5
         192
                  Congo, Dem. Rep.
                                            COD
                                                    42.394
                                                                      2.2
         193
                            Zambia
                                            ZMB
                                                    40.471
                                                                      15.4
         194
                          Zimbabwe
                                            ZWE
                                                    35.715
                                                                      18.5
                      IncomeGroup
                      High income
         0
         1
                       Low income
         2
              Upper middle income
         3
              Upper middle income
         4
                      High income
         190
              Lower middle income
         191
              Upper middle income
         192
                       Low income
         193
              Lower middle income
         194
                       Low income
         [195 rows x 5 columns]>
```

In [10]: df\_num=df[['BirthRate', 'InternetUsers']] df\_num

| 0 1 | F 4 0 7 |  |
|-----|---------|--|
| ( ) | 170     |  |
| Out | 1 TO    |  |

|     | 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 [11]:
         df.tail()
```

| Out[11]: |            | 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 [12]: | df.h       | ead()               |               |             |                |                     |
| 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 |
|          | <b>4</b> U | nited Arab Emirates | ARE           | 11.044      | 88.0           | High income         |
| In [13]: | df.t       | ail(2)              |               |             |                |                     |
| Out[13]: |            | CountryName C       | ountryCode B  | irthRate Ir | nternetUsers   | IncomeGroup         |
|          | 193        | Zambia              | ZMB           | 40.471      | 15.4 L         | ower middle income  |
|          | 194        | Zimbabwe            | ZWE           | 35.715      | 18.5           | Low income          |
| In [14]: | df.h       | ead(2)              |               |             |                |                     |
| Out[14]: | C          | ountryName Cou      | ntryCode Birt | hRate Inte  | rnetUsers Inco | omeGroup            |
|          | 0          | Aruba               | ABW 1         | 0.244       | 78.9 H         | igh income          |
|          | 1          | Afghanistan         | AFG 3         | 35.253      | 5.9 L          | ow income           |
|          |            |                     |               |             |                |                     |
| In [15]: | df[:       | :-1]                |               |             |                |                     |

| $\cap$ | 11 | Γ1 | 57  |   |
|--------|----|----|-----|---|
| U      | ИL | ᆫᅩ | ~ ] | ۰ |

|     | 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<br>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 [16]: df[6:]

Out[16]:

|     | CountryName            | CountryCode | BirthRate | InternetUsers | IncomeGroup         |
|-----|------------------------|-------------|-----------|---------------|---------------------|
| 6   | Armenia                | ARM         | 13.308    | 41.9000       | Lower middle income |
| 7   | Antigua and<br>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 |
| ••• | <b></b>                |             |           |               |                     |
| 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 [17]: df[0:200:10]

Out[17]:

|   |     | 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 |
| 1 | 100 | Libya       | LBY         | 21.425    | 16.500000     | Upper middle income |
| 1 | 110 | Moldova     | MDA         | 12.141    | 45.000000     | Lower middle income |
| 1 | 120 | Mozambique  | MOZ         | 39.705    | 5.400000      | Low income          |
| 1 | 130 | Netherlands | NLD         | 10.200    | 93.956400     | High income         |
| 1 | 140 | Poland      | POL         | 9.600     | 62.849200     | High income         |
| 1 | 150 | Sudan       | SDN         | 33.477    | 22.700000     | Lower middle income |
| 1 | 160 | Suriname    | SUR         | 18.455    | 37.400000     | Upper middle income |
| 1 | 170 | Tajikistan  | TJK         | 30.792    | 16.000000     | Lower middle income |
| 1 | 180 | Uruguay     | URY         | 14.374    | 57.690000     | High income         |
|   |     |             |             |           |               |                     |

In [18]: df.describe() #describes the statistical data of the data set #this function always print numerical data

14.520000

YEM

32.947

20.000000 Lower middle income

| Out[18]: |       | BirthRate  | InternetUsers |
|----------|-------|------------|---------------|
|          | count | 195.000000 | 195.000000    |
|          | mean  | 21.469928  | 42.076471     |
|          | std   | 10.605467  | 29.030788     |
|          | min   | 7.900000   | 0.900000      |

Yemen, Rep.

190

25%

| 50% | 19.680000 | 41.000000 |
|-----|-----------|-----------|
| 75% | 29.759500 | 66.225000 |
| may | 49.661000 | 96 546800 |

12.120500

```
In [19]:
          df.describe().transpose() #this function will convert rows to columns
Out[19]:
                                                                     50%
                                                                             75%
                         count
                                    mean
                                                 std
                                                      min
                                                              25%
                                                                                      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
          df.columns
In [20]:
          Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
                  'IncomeGroup'],
                 dtype='object')
          df.columns=['a','b','c','d','e'] #as list is mutable we can change the columns
In [21]:
                                              #renaming the atributes
In [22]:
          df.columns
          Index(['a', 'b', 'c', 'd', 'e'], dtype='object')
Out[22]:
In [23]:
          df.head()
Out[23]:
                                                  d
                               a
                                     b
                                             C
                                                                       е
          0
                          Aruba
                                  ABW
                                        10.244
                                               78.9
                                                             High income
          1
                     Afghanistan
                                  AFG
                                        35.253
                                                 5.9
                                                              Low income
                                                     Upper middle income
          2
                          Angola
                                  AGO
                                        45.985
                                               19.1
          3
                         Albania
                                        12.877
                                               57.2
                                                     Upper middle income
             United Arab Emirates
                                  ARE
                                       11.044
                                               88.0
                                                             High income
          df.columns=['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
In [24]:
                  'IncomeGroup']
In [25]:
          df.columns
          Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
                  'IncomeGroup'],
                 dtype='object')
In [26]:
          df.head()
Out[26]:
                   CountryName
                                 CountryCode
                                                BirthRate
                                                          InternetUsers
                                                                               IncomeGroup
          0
                                          ABW
                                                   10.244
                                                                   78.9
                          Aruba
                                                                                 High income
                                          AFG
                                                                    5.9
          1
                     Afghanistan
                                                   35.253
                                                                                  Low income
          2
                          Angola
                                          AGO
                                                   45.985
                                                                         Upper middle income
                                                                   19.1
                                                                         Upper middle income
          3
                         Albania
                                          ALB
                                                   12.877
                                                                    57.2
             United Arab Emirates
                                          ARE
                                                   11.044
                                                                   88.0
                                                                                 High income
```

```
In [27]:
          df.columns
Out[27]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
                  'IncomeGroup'],
                dtype='object')
         df[['CountryName', 'CountryCode', 'BirthRate']]
In [28]:
Out[28]:
                    CountryName CountryCode BirthRate
            0
                            Aruba
                                           ABW
                                                    10.244
                       Afghanistan
                                           AFG
                                                    35.253
            2
                           Angola
                                           AGO
                                                    45.985
            3
                           Albania
                                            ALB
                                                    12.877
               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 [29]: df.isnull

```
Out[29]: <bound method DataFrame.isnull of
                                                            CountryName CountryCode BirthR
          ate InternetUsers \
          0
                                             ABW
                                                      10.244
                                                                        78.9
                               Aruba
                                             AFG
          1
                        Afghanistan
                                                      35.253
                                                                         5.9
          2
                              Angola
                                             AGO
                                                      45.985
                                                                        19.1
          3
                             Albania
                                             ALB
                                                      12.877
                                                                        57.2
          4
               United Arab Emirates
                                             ARE
                                                      11.044
                                                                        88.0
                                             . . .
                                                         . . .
                                                                         . . .
          190
                        Yemen, Rep.
                                             YEM
                                                      32.947
                                                                        20.0
          191
                       South Africa
                                             ZAF
                                                      20.850
                                                                        46.5
          192
                   Congo, Dem. Rep.
                                             COD
                                                      42.394
                                                                        2.2
          193
                              Zambia
                                             ZMB
                                                      40.471
                                                                        15.4
          194
                            Zimbabwe
                                             ZWE
                                                      35.715
                                                                        18.5
                       IncomeGroup
                       High income
          0
          1
                        Low income
               Upper middle income
          2
          3
               Upper middle income
          4
                       High income
          190
               Lower middle income
               Upper middle income
          191
                        Low income
          192
               Lower middle income
          193
          194
                         Low income
          [195 rows x 5 columns]>
In [30]: df_cate=df[['CountryName', 'CountryCode']]
          df_cate.head()
Out[30]:
                  CountryName CountryCode
          0
                                        ABW
                         Aruba
                     Afghanistan
                                         AFG
          1
          2
                                        AGO
                         Angola
          3
                                         ALB
                        Albania
            United Arab Emirates
                                         ARE
```

In [31]: df.describe()

| 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     |
|          | <b>75</b> % | 29.759500  | 66.225000     |
|          | max         | 49.661000  | 96.546800     |
|          |             |            |               |

In [32]: df\_cate.describe()

| $\cap$ | ı+l | - 3 | 21  | 0 |
|--------|-----|-----|-----|---|
| Ot     | 1 - | LJ  | - ] | ۰ |

|        | CountryName | CountryCode |
|--------|-------------|-------------|
| count  | 195         | 195         |
| unique | 195         | 195         |
| top    | Aruba       | ABW         |
| freq   | 1           | 1           |

In [33]: df\_num=df[['BirthRate', 'InternetUsers']]

In [34]: df\_num

Out[34]:

|     | 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 [35]: df\_num.transpose

```
Out[35]: <bound method DataFrame.transpose of
                                                       BirthRate InternetUsers
          0
                   10.244
                                     78.9
                   35.253
                                     5.9
          1
          2
                                     19.1
                  45.985
          3
                                     57.2
                   12.877
          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
                   35.715
          194
                                     18.5
          [195 rows x 2 columns]>
In [36]:
          df.head
          <bound method NDFrame.head of</pre>
                                                         CountryName CountryCode BirthRate
Out[36]:
          InternetUsers \
          0
                               Aruba
                                              ABW
                                                       10.244
                                                                         78.9
                         Afghanistan
                                              AFG
          1
                                                       35.253
                                                                          5.9
          2
                              Angola
                                              AG0
                                                       45.985
                                                                         19.1
          3
                             Albania
                                              ALB
                                                       12.877
                                                                         57.2
          4
               United Arab Emirates
                                              ARE
                                                       11.044
                                                                         88.0
                                              . . .
                                                          . . .
                                                                          . . .
          190
                         Yemen, Rep.
                                              YEM
                                                       32.947
                                                                         20.0
                                                                         46.5
          191
                        South Africa
                                              ZAF
                                                       20.850
          192
                    Congo, Dem. Rep.
                                              COD
                                                       42.394
                                                                         2.2
          193
                                              ZMB
                                                       40.471
                                                                         15.4
                              Zambia
          194
                            Zimbabwe
                                              ZWE
                                                       35.715
                                                                         18.5
                        IncomeGroup
          0
                        High income
          1
                         Low income
          2
               Upper middle income
          3
               Upper middle income
          4
                        High income
               Lower middle income
          190
               Upper middle income
          191
          192
                         Low income
          193
               Lower middle income
          194
                         Low income
          [195 rows x 5 columns]>
         df.BirthRate*df.InternetUsers
```

```
Out[37]: 0
                  808.2516
          1
                  207.9927
          2
                  878.3135
          3
                  736.5644
          4
                  971.8720
          190
                  658.9400
          191
                  969.5250
                   93.2668
          192
          193
                  623.2534
                  660.7275
          194
          Length: 195, dtype: float64
          df['mycalc']=df.BirthRate*df.InternetUsers #adding a column
In [38]:
In [39]:
Out[39]:
                CountryName CountryCode
                                             BirthRate InternetUsers
                                                                      IncomeGroup
                                                                                       mycalc
             0
                       Aruba
                                       ABW
                                                10.244
                                                                 78.9
                                                                        High income
                                                                                     808.2516
             1
                  Afghanistan
                                        AFG
                                                                  5.9
                                                                         Low income
                                                                                     207.9927
                                                35.253
                                                                       Upper middle
            2
                                                                                     878.3135
                       Angola
                                       AGO
                                                45.985
                                                                 19.1
                                                                             income
                                                                       Upper middle
             3
                                                                 57.2
                                                                                      736.5644
                      Albania
                                        ALB
                                                12.877
                                                                             income
                  United Arab
                                        ARE
                                                11.044
                                                                 88.0
                                                                        High income
                                                                                     971.8720
                     Emirates
                                                                       Lower middle
                                                                 20.0
                                                                                      658.9400
          190
                  Yemen, Rep.
                                       YEM
                                                32.947
                                                                             income
                                                                       Upper middle
                                                                                      969.5250
          191
                  South Africa
                                        ZAF
                                                20.850
                                                                 46.5
                                                                             income
                  Congo, Dem.
          192
                                       COD
                                                42.394
                                                                  2.2
                                                                         Low income
                                                                                      93.2668
                         Rep.
                                                                        Lower middle
          193
                                                                 15.4
                                                                                      623.2534
                      Zambia
                                       ZMB
                                                40.471
                                                                             income
                    Zimbabwe
          194
                                       ZWE
                                                35.715
                                                                 18.5
                                                                         Low income
                                                                                     660.7275
         195 rows × 6 columns
In [40]:
          df.columns
          Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
Out[40]:
                  'IncomeGroup', 'mycalc'],
                 dtype='object')
          len(df.columns)
In [41]:
Out[41]: 6
```

In [42]: df.drop('mycalc',axis=1) #dropping the particular column

| Out[42]: |     | 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<br>income |
|          | 3   | Albania                 | ALB         | 12.877    | 57.2          | Upper middle income    |
|          | 4   | United Arab<br>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 [43]: df['InternetUsers']
Out[43]: 0
                 78.9
          1
                 5.9
          2
                 19.1
                 57.2
          3
                 88.0
          190
                 20.0
          191
                 46.5
          192
                 2.2
          193
                 15.4
          194
                 18.5
          Name: InternetUsers, Length: 195, dtype: float64
In [44]: df['InternetUsers']<2</pre>
```

localhost:8888/doc/tree/country gdp analysis using pandas and seaborn.ipynb

```
Out[44]: 0
                  False
                  False
          1
          2
                  False
          3
                  False
          4
                  False
          190
                  False
          191
                  False
          192
                  False
          193
                  False
          194
                  False
          Name: InternetUsers, Length: 195, dtype: bool
In [45]: filter=df['InternetUsers']<2</pre>
          filter
Out[45]:
          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
          df[filter] #filtering the data
In [46]:
Out[46]:
                CountryName CountryCode BirthRate InternetUsers
                                                                        IncomeGroup
                                                                                       mycalc
            11
                      Burundi
                                        BDI
                                                44.151
                                                                  1.3
                                                                          Low income
                                                                                      57.3963
            52
                       Eritrea
                                                34.800
                                                                  0.9
                                                                          Low income 31.3200
                                        ERI
            55
                      Ethiopia
                                        ETH
                                                32.925
                                                                  1.9
                                                                          Low income 62.5575
                                                                          Low income
            64
                       Guinea
                                        GIN
                                                37.337
                                                                  1.6
                                                                                      59.7392
                                                                        Lower middle
                                                                                      28.9904
          117
                     Myanmar
                                      MMR
                                                18.119
                                                                  1.6
                                                                              income
          127
                        Niger
                                       NER
                                                49.661
                                                                  1.7
                                                                          Low income 84.4237
          154
                  Sierra Leone
                                        SLE
                                                                  1.7
                                                36.729
                                                                          Low income
                                                                                      62.4393
          156
                                                                  1.5
                                                                          Low income 65.8365
                      Somalia
                                       SOM
                                                43.891
                                                                        Lower middle
          172
                  Timor-Leste
                                        TLS
                                                                  1.1
                                                                                      39.3305
                                                35.755
                                                                              income
In [47]:
         len(df[filter])
Out[47]: 9
In [48]:
          df
```

Out[48]:

|     | 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<br>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.<br>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 |

In [49]: df[filter]

195 rows × 6 columns

| Out | [49 | ]: |
|-----|-----|----|
|     |     |    |

|     | 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 [50]: df

| Out[50]: |  | 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<br>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.<br>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 rd   | ows × 6 columns         | i           |           |               |                     |          |
| In [51]: | filt   | er1=df['BirthR          | ate']>40    |           |               |                     |          |
| In [52]: | df.IncomeGroup.unique()  |                         |             |           |               |                     |          |
| Out[52]: | array(['High income', 'Low income', 'Upper middle income',                       |                         |             |           |               |                     |          |
| In [53]: | <pre>df.IncomeGroup.nunique()</pre>  |                         |             |           |               |                     |          |
| Out[53]: | 4  |                         |             |           |               |                     |          |
| In [54]: | df.CountryName.nunique() #we have taken data of 195 countries to analze the data |                         |             |           |               |                     |          |
| Out[54]: | 195  |                         |             |           |               |                     |          |
| In [55]: | df.columns   |                         |             |           |               |                     |          |
| Out[55]: | <pre>Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',</pre>    |                         |             |           |               |                     |          |

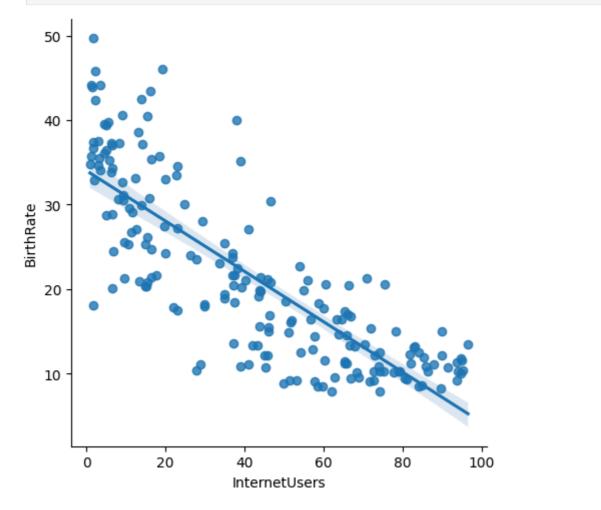
```
In [56]:
          import matplotlib.pyplot as plt
          import seaborn as sns
          %matplotlib inline
          plt.rcParams['figure.figsize']=10,2
          import warnings
          warnings.filterwarnings('ignore') #ignoring os errors
In [57]:
         df.columns
Out[57]: Index(['CountryName', 'CountryCode', 'BirthRate', 'InternetUsers',
                  'IncomeGroup', 'mycalc'],
                 dtype='object')
          vis1=sns.distplot(df['InternetUsers'])
In [58]:
          plt.show()
           0.020
           0.015
        Density
          0.010
           0.005
           0.000
                                 Ó
                                         20
                                                            60
                                                                     80
                                                                              100
                                                                                        120
                      -20
                                                   40
                                                   InternetUsers
In [59]:
          vis2=sns.displot(df['InternetUsers'])
          plt.show()
            40
            35
            30
            25
         Count
            20
            15
            10
             5
             0
                             20
                  0
                                         40
                                                     60
                                                                 80
                                                                            100
                                         InternetUsers
```

```
vis3=sns.boxplot(data=df,x='IncomeGroup',y='BirthRate')
plt.show()

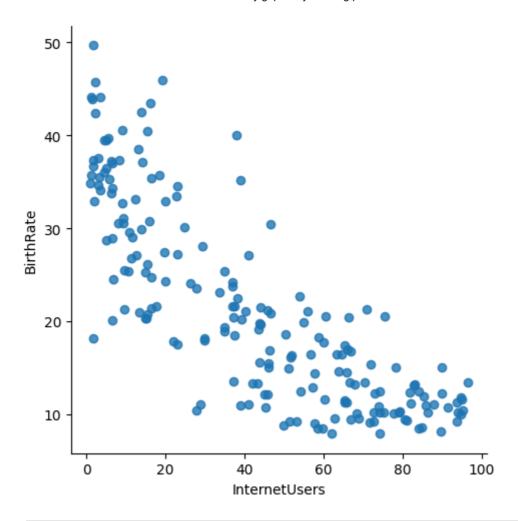
This income Low income Upper middle income Lower middle income IncomeGroup

This incomeGroup
```

In [61]: vis4=sns.lmplot(data=df,x='InternetUsers',y='BirthRate')
plt.show()



In [62]: vis5=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',fit\_reg=False)
 plt.show()



In [63]: vis6=sns.lmplot(data=df,x='InternetUsers',y='BirthRate',hue='IncomeGroup',fit\_re
plt.show()

