Answers to Question Set 10

Date: 01/05/2020 Name: D.Saravanan

1. Write a python program to get input from the user.

   Program:

```
#!/usr/bin/env python3
import numpy as np
import pandas as pd
from gapminder import gapminder

df = gapminder.copy()

N = int(input("Enter the number of countries to display: "))
w = input("Enter Y to display the top {} countries based on GDP: ".format(N))
```

   Output:

```
Enter the number of countries to display: 3
Enter Y to display the top 3 countries based on GDP: Y
```

2. Display the growth percentage for the number of countries given by the user sorted based on the mean GDP per capita.

Program:

```
#!/usr/bin/env python3
import numpy as np
import pandas as pd
from gapminder import gapminder

df = gapminder.copy()

N = int(input("Enter the number of countries to display: "))
w = input("Enter Y to display the top {} countries based on GDP: ".format(N))

if w == 'Y':
    meandf = df.groupby('country')['gdpPercap'].mean()
    sortdf = meandf.sort_values(ascending=False).head(N)
    resetdf = sortdf.reset_index()

    print("\n'''Growth Percentage of top {} countries (1952-2007) Data'''".format(N))
    for name in resetdf['country']:
        country = df.loc[df['country'] == name]
        country = country.set_index('year', drop = True)
        country.index.name = None
        country = country.loc[:, 'lifeExp':'gdpPercap']
        country.columns = ['Life Exp', 'Population', 'GDPperCapita']
        country = country.pct_change()*100
        print("\n{}'s Growth Percentage Information \n {}".format(name, country))
```

Output:

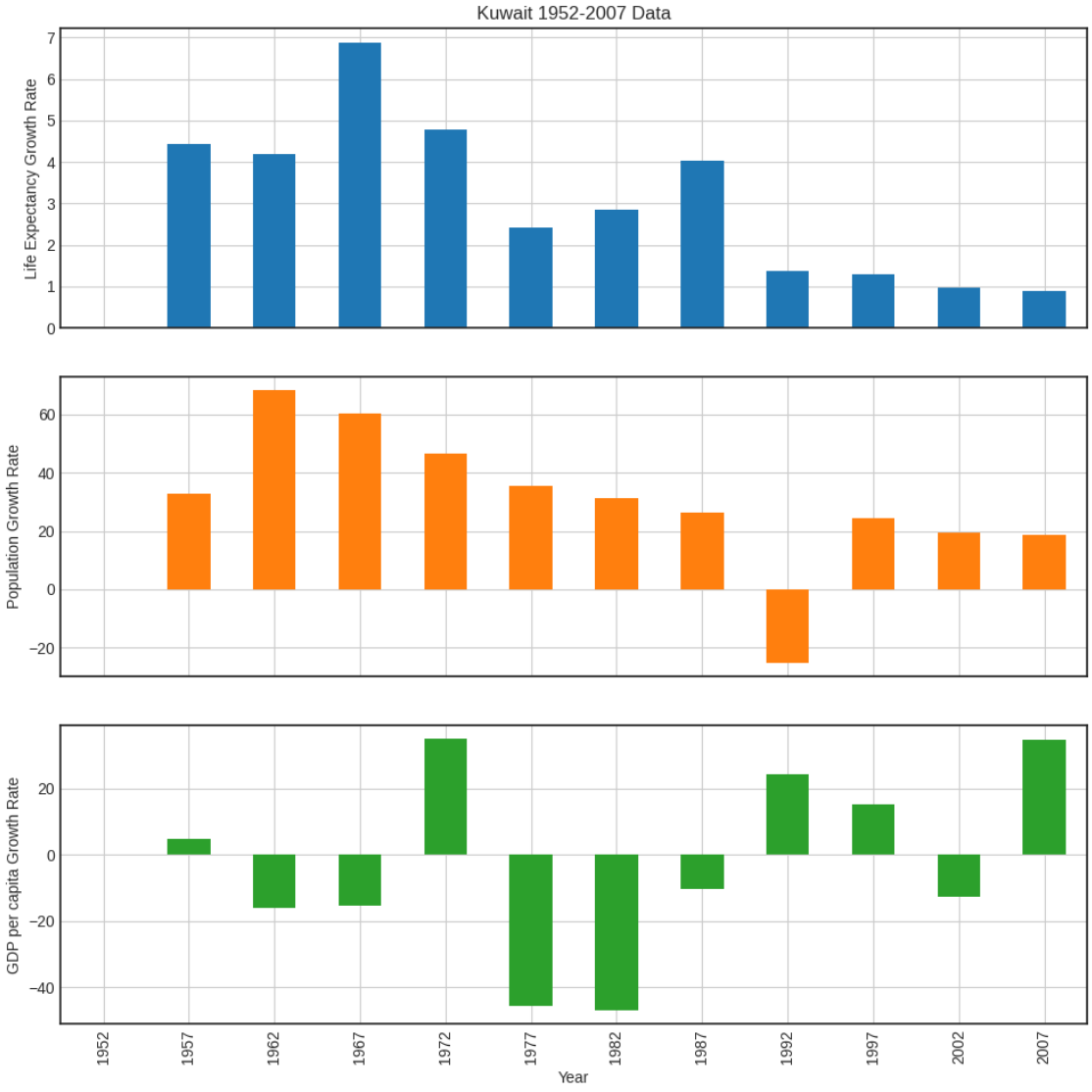
```
Enter the number of countries to display: 3
Enter Y to display the top 3 countries based on GDP: Y

'''Growth Percentage of top 3 countries (1952-2007) Data'''

Kuwait's Growth Percentage Information
       Life Exp  Population  GDPperCapita
1952        NaN         NaN           NaN
1957   4.441645   33.028750      4.743189
1962   4.199335   68.321697    -15.913075
1967   6.869522   60.496112    -15.256146
1972   4.778410   46.422540     35.172785
1977   2.408731   35.444940    -45.800976
1982   2.835182   31.318000    -47.095616
1987   4.017726   26.310155    -10.319583
1992   1.369752  -25.027505     24.234958
1997   1.284745   24.487076     15.365736
2002   0.982194   19.611804    -12.879490
2007   0.889421   18.659087     34.738956

Switzerland's Growth Percentage Information
       Life Exp  Population  GDPperCapita
1952        NaN         NaN           NaN
1957   1.350187    6.458982     21.550202
1962   1.077098   10.534530     14.079703
1967   2.033090    7.006707     12.407812
1972   1.387935    5.581395     18.413926
1977   2.182163   -1.327460     -0.782576
1982   1.087677    2.401707      5.245754
1987   1.574597    2.810953      6.634299
1992   0.800930    5.195609      5.250120
1997   1.717288    2.834901      0.827675
2002   1.574902    2.335301      7.299241
2007   1.340858    2.620353      8.774296

Norway's Growth Percentage Information
       Life Exp  Population  GDPperCapita
1952        NaN         NaN           NaN
1957   1.059584    4.934598     15.438199
1962   0.040850    4.209153     15.414730
1967   0.830271    4.042409     21.646008
1972   0.350972    3.882310     15.910027
1977   1.385526    2.801955     22.917380
1982   0.796073    1.770427     12.814728
1987  -0.105305    1.734233     19.933884
1992   1.884306    2.393848      7.687417
1997   1.293326    2.783599     21.543827
2002   0.932074    2.948903      8.237767
2007   1.449715    2.035788     10.458369
```

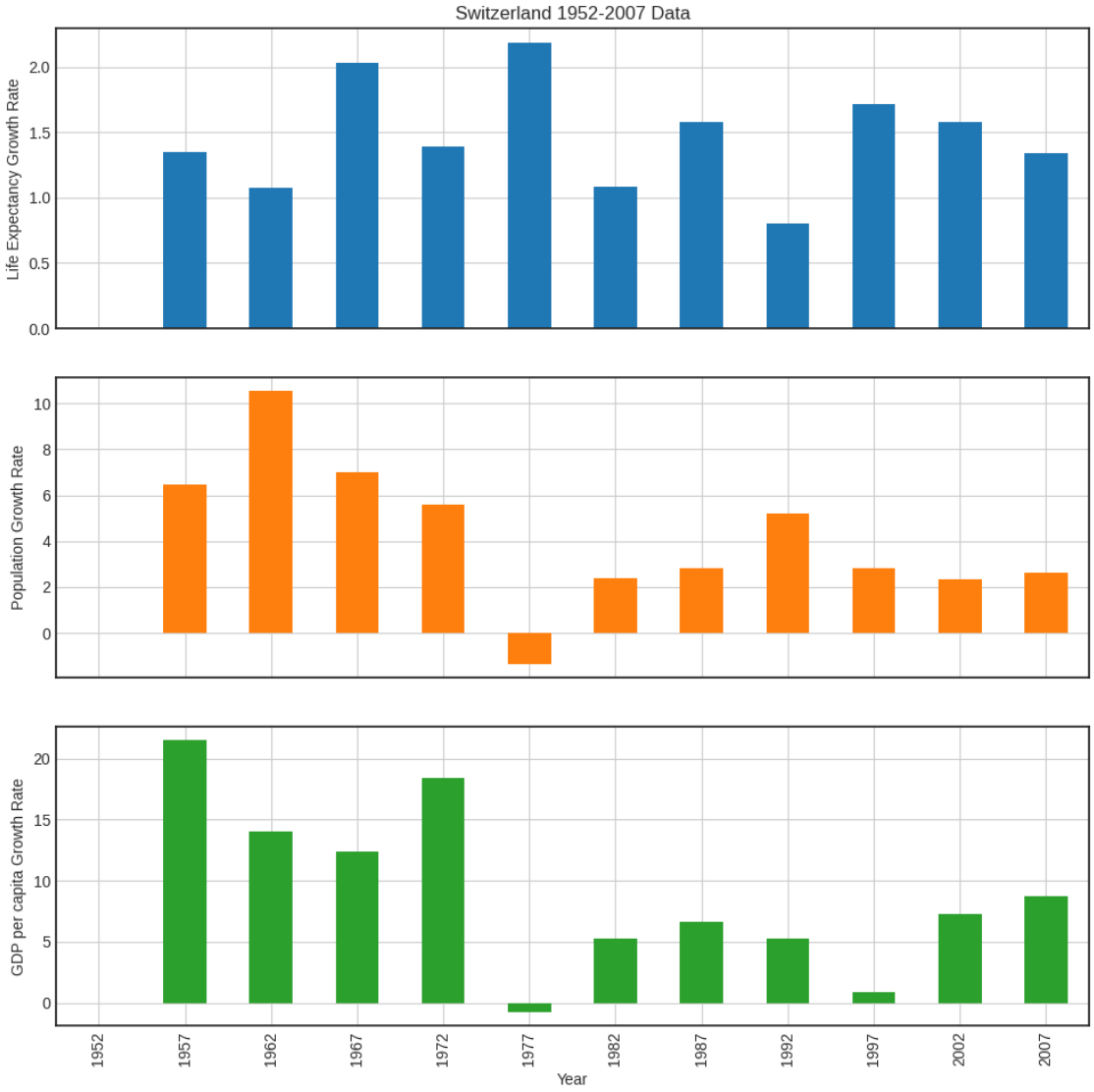
3. Plot a bar plot of the growth percentage.

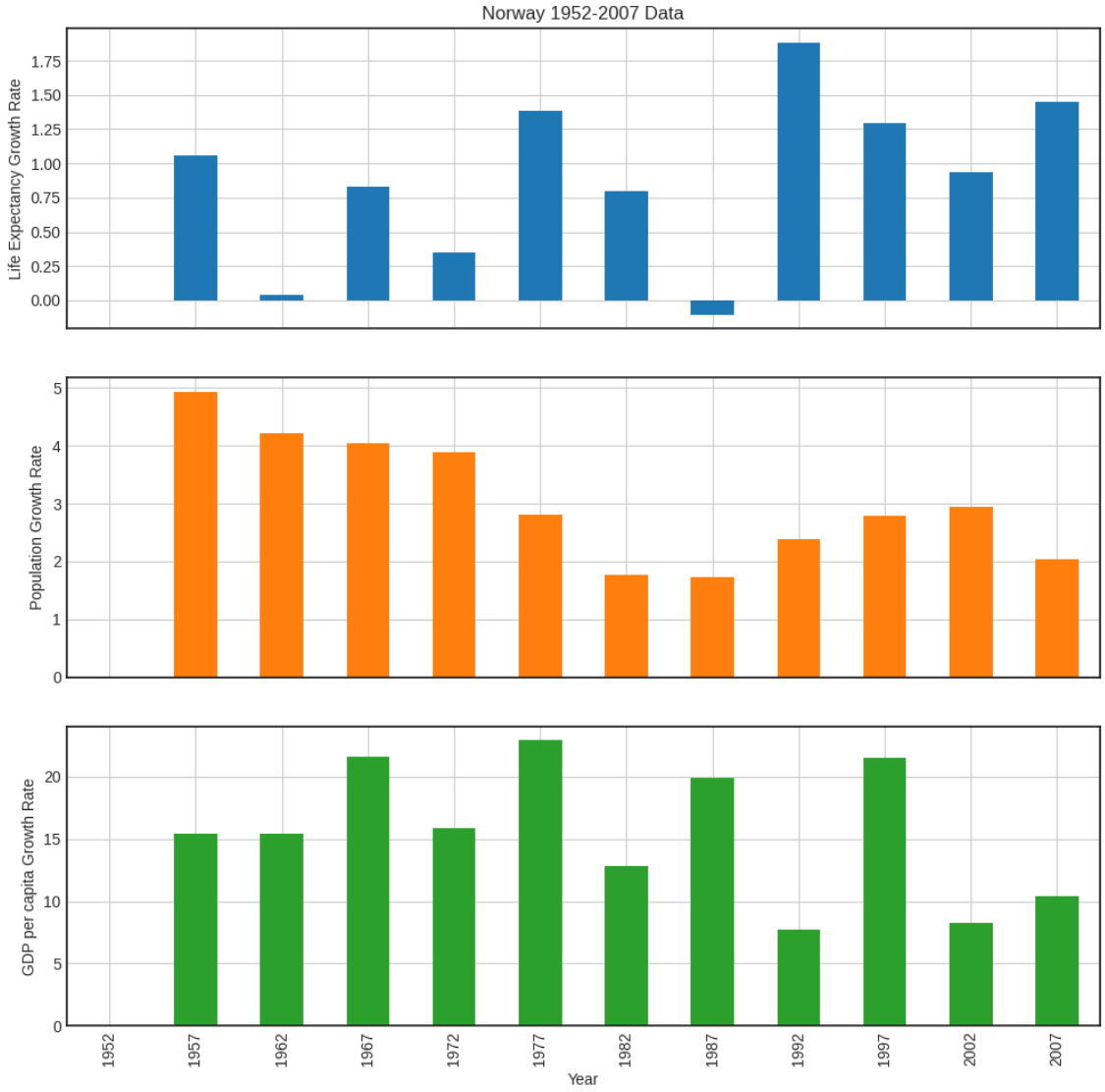
Program:

```
#!/usr/bin/env python3
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
plt.style.use('seaborn-white')
from gapminder import gapminder

df = gapminder.copy()

N = int(input("Enter the number of countries to display: "))
w = input("Enter Y to display the top {} countires based on GDP: ".format(N))

if w == 'Y':
    meandf = df.groupby('country')['gdpPercap'].mean()
    sortdf = meandf.sort_values(ascending=False).head(N)
    resetdf = sortdf.reset_index()

    print("\n'''Growth Percentage of top {} countries (1952-2007) Data'''".format(N))
    for name in resetdf['country']:
        country = df.loc[df['country'] == name]
        country = country.set_index('year', drop = True)
        country.index.name = None
        country = country.loc[:, 'lifeExp':'gdpPercap']
        country.columns = ['Life Exp', 'Population', 'GDPperCapita']
        country = country.pct_change()*100
        print("\n{}'s Growth Percentage Information \n {}".format(name, country))

        ax = country.plot(figsize=(10,10), subplots=True, kind="bar", grid=True, legend=False)
        ax[0].set(ylabel='Life Expectancy Growth Rate', title="{} 1952-2007 Data".format(name))
        ax[1].set(ylabel='Population Growth Rate', title=" ")
        ax[2].set(ylabel='GDP per capita Growth Rate', title=" ")
        ax[2].set_xlabel('Year')
        plt.tight_layout()
        plt.savefig('{}.png'.format(name))
        plt.show()
```

Output:


Kuwait 1952-2007 Data
Life Expectancy Growth Rate
Population Growth Rate
GDP per capita Growth Rate
Year
1952
1957
1962
1967
1972
1977
1982
1987
1992
1997
2002
2007


Switzerland 1952-2007 Data
Life Expectancy Growth Rate
0.0
0.5
1.0
1.5
2.0
Population Growth Rate
0
2
4
6
8
10
GDP per capita Growth Rate
0
5
10
15
20
1952
1957
1962
1967
1972
1977
1982
1987
1992
1997
2002
2007
Year


Norway 1952-2007 Data
Life Expectancy Growth Rate
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Population Growth Rate
5
4
3
2
1
0
GDP per capita Growth Rate
20
15
10
5
0
1952
1957
1962
1967
1972
1977
1982
1987
1992
1997
2002
2007
Year