

Mini Project (Relationship b/w Inflation and GDP Growth 2002-2020 in Afghanistan)

PDF Of Jupyter Notebook

Research Question: Evaluating the relationship between Inflation (Consumer prices) and GDP growth (annual%) in Afghanistan

The World Development Indicators Dataset has been used

Data Source: <https://databank.worldbank.org/source/world-development-indicators>
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Firstly, we will do initial exploration of the data by downloading all the relevant libraries

```
In [82]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

```
In [88]: data = pd.read_csv('./Indicators.csv')
```

```
In [89]: data.head()
```

Out[89]:

	Country Name	Country Code	IndicatorName	IndicatorCode	Year	Value
0	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2012	12.7
1	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2012	6.4
2	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2013	5.6
3	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2013	7.3
4	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2014	2.7

```
In [90]: Afghanistan = data['Country Name'] == 'Afghanistan'
```

In [91]: data[Afghanistan][:5]

Out[91]:

	Country Name	Country Code	IndicatorName	IndicatorCode	Year	Value
0	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2012	12.7
1	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2012	6.4
2	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2013	5.6
3	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2013	7.3
4	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2014	2.7

```
In [92]: hist_indicator = 'GDP growth'
hist_country = 'AFG'

mask1 = data['IndicatorName'].str.contains(hist_indicator)
mask2 = data['Country Code'].str.contains(hist_country)
Stage = data[mask1 & mask2]
```

We have stored our masked data or fetched data for GDP growth of Afghanistan Afghanistan in the temporary data set known as Stage

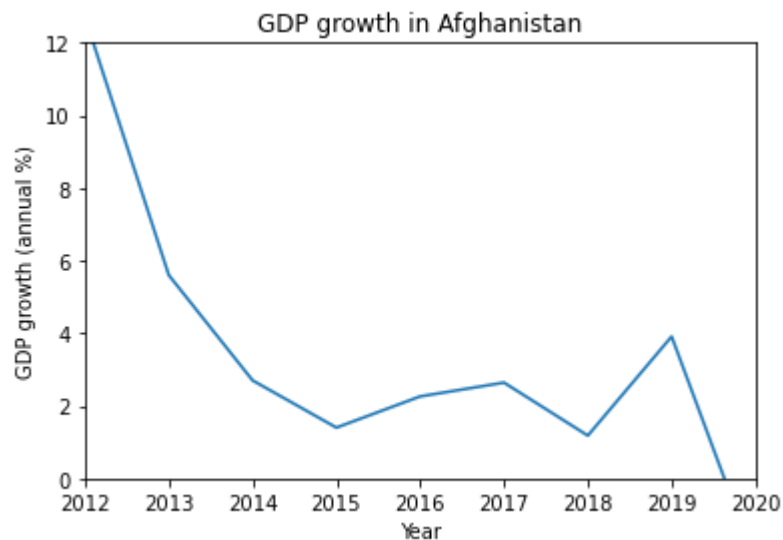
In [93]: Stage.head()

Out[93]:

	Country Name	Country Code	IndicatorName	IndicatorCode	Year	Value
0	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2012	12.70
2	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2013	5.60
4	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2014	2.70
6	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2015	1.40
8	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	2016	2.26

```
In [96]: import matplotlib.pyplot as plt
# make a line plot
plt.plot(Stage['Year'].values, Stage['Value'].values)
# Label the axis
plt.xlabel('Year')
plt.ylabel(Stage['IndicatorName'] .iloc[0])
#Label the figure
plt.title('GDP growth in Afghanistan')
plt.axis([2012,2020,0,12])

plt.show()
```



```
In [59]: print(max(Stage['Year'].values))
```

2020

```
In [60]: print(min(Stage['Year'].values))
```

2012

```
In [95]: mask3 = data['IndicatorName'].str.contains('Inflation')
mask4 = data['Country Code'].str.contains('AFG')
Inflation = data[mask3 & mask4]
```

In [97]: `Inflation.head()`

Out[97]:

	Country Name	Country Code	IndicatorName	IndicatorCode	Year	Value
1	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2012	6.40
3	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2013	7.30
5	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2014	4.67
7	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2015	-0.66
9	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	2016	4.38

In [63]: `print(max(Inflation['Year'].values))`

2020

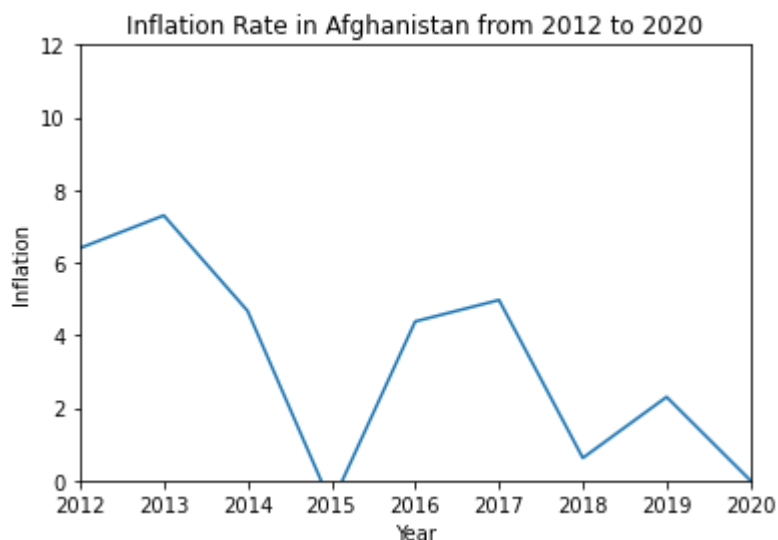
In [64]: `print(min(Inflation['Year'].values))`

2012

Chart 2. Inflation rate (Consumer prices) during the years 2012-2020

```
In [80]: import matplotlib.pyplot as plt
# make a line plot
plt.plot(Inflation['Year'].values, Inflation['Value'].values)
# Label the axis
plt.xlabel('Year')
plt.ylabel(Inflation['IndicatorName'] .iloc[0])
#Label the figure
plt.title('Inflation Rate in Afghanistan from 2012 to 2020')
plt.axis([2012,2020,0,12])

plt.show()
```



```
In [66]: print("Stage Min Year = ", Stage['Year'].min(), "max: ", Stage['Year'].max())
print("Internet users Min Year = ", Inflation['Year'].min(), "max: ", Inflation['
```

```
Stage Min Year = 2012 max: 2020
Internet users Min Year = 2012 max: 2020
```

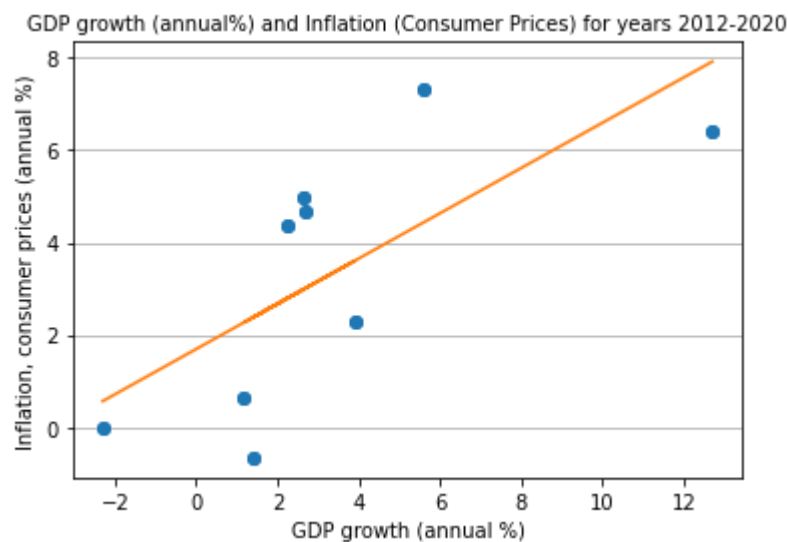
Chart 3. GDP Growth (annual%) Vs. Inflation(Consumer Prices) for the years Indicators of Afghansitan between 2012 to 2020

```
In [98]: fig, axis = plt.subplots()
# Grid lines, Xticks, Xlabel, Ylabel
axis.yaxis.grid(True)
axis.set_title('GDP growth (annual%) and Inflation (Consumer Prices) for years 2012-2020')
axis.set_xlabel(Stage['IndicatorName'].iloc[0],fontsize=10)
axis.set_ylabel(Inflation['IndicatorName'].iloc[0],fontsize=10)
X = Stage['Value']
Y = Inflation['Value']

#Changing the line color to orange
#calculating the slope and y intercept, m = slope, b=intercept.
#add line of best fit (linear regression line)

plt.plot(X, Y, 'o')
m, b = np.polyfit(X, Y, 1)
plt.plot(X, m*X + b)
#visualizing the scatter plot.
axis.scatter(X, Y)
```

Out[98]: <matplotlib.collections.PathCollection at 0x1d4ad9f3ac0>



The Correlation Coefficient of GDP per Capita and Internet Users Variables using np.corrcoef.

```
In [69]: cor = np.corrcoef(Stage['Value'], Inflation['Value'])
print(cor)

[[1.          0.70108179]
 [0.70108179 1.          ]]
```

In []:

