the_india_story

March 17, 2024

0.1 The rise of India's Gross Domestic Product metric- An analysis.

[ ]:
```
#print("hello")

import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')

df = pd.read_csv("India_GDP_1960-2022.csv")
df.head()
```

[ ]:

	Unnamed: 0	India GDP - Historical Data	India GDP - Historical Data.1	\
0	NaN	Year	GDP	
1	0.0	2021	$3,173.40B	
2	1.0	2020	$2,667.69B	
3	2.0	2019	$2,831.55B	
4	3.0	2018	$2,702.93B	

	India GDP - Historical Data.2	India GDP - Historical Data.3
0	Per Capita	Growth
1	$2,277	8.95%
2	$1,933	-6.60%
3	$2,072	3.74%
4	$1,998	6.45%

[ ]:
```
#Dropping the first column

df.drop(columns= "Unnamed: 0", axis=1,inplace=True)

df.head()
```

[ ]:

	India GDP - Historical Data	India GDP - Historical Data.1	\
0	Year	GDP	
1	2021	$3,173.40B	
2	2020	$2,667.69B	
3	2019	$2,831.55B	

```
4                        2018                    $2,702.93B

  India GDP - Historical Data.2 India GDP - Historical Data.3
0                    Per Capita                        Growth
1                        $2,277                         8.95%
2                        $1,933                        -6.60%
3                        $2,072                         3.74%
4                        $1,998                         6.45%
```

[ ]:
```
#Renaming the columns

columns = {
    'India GDP - Historical Data' : 'Year',
    'India GDP - Historical Data.1'        : 'GDP (in billion dollars)',
    'India GDP - Historical Data.2'        : 'Per Capita (in dollars)',
    'India GDP - Historical Data.3' : 'Growth'

}

df.rename(columns=columns,inplace=True)

df.head()
```

[ ]:
```
   Year GDP (in billion dollars) Per Capita (in dollars)  Growth
0  Year                     GDP              Per Capita  Growth
1  2021              $3,173.40B                  $2,277   8.95%
2  2020              $2,667.69B                  $1,933  -6.60%
3  2019              $2,831.55B                  $2,072   3.74%
4  2018              $2,702.93B                  $1,998   6.45%
```

[ ]:
```
#Remove the first row.

df.drop(index=0,inplace=True)

df
```

[ ]:
```
    Year GDP (in billion dollars) Per Capita (in dollars)  Growth
1   2021              $3,173.40B                  $2,277   8.95%
2   2020              $2,667.69B                  $1,933  -6.60%
3   2019              $2,831.55B                  $2,072   3.74%
4   2018              $2,702.93B                  $1,998   6.45%
5   2017              $2,651.47B                  $1,981   6.80%
..   …                       …                       …      …
58  1964                 $56.48B                    $116   7.45%
59  1963                 $48.42B                    $101   5.99%
60  1962                 $42.16B                     $90   2.93%
61  1961                 $39.23B                     $85   3.72%
```

```
62  1960                  $37.03B                      $82       %

[62 rows x 4 columns]
```

[ ]:
```
#Check for null values in the dataset
df.isnull().sum()
```

[ ]:
```
Year                          0
GDP (in billion dollars)      0
Per Capita (in dollars)       0
Growth                        0
dtype: int64
```

[ ]:
```
#Convert GDP ,Per Capita and Growth columns in integer

df['GDP (in billion dollars)'] = df['GDP (in billion dollars)'].replace('[\$\,\.
 ↪\"B"]', '', regex=True).astype(int)
df

df['Per Capita (in dollars)'] = df['Per Capita (in dollars)'].replace('[\$\,\.
 ↪]','',regex=True).astype(int)
df['Growth'] = df['Growth'].replace(["%"], ["0%"])

df['Growth'] = df['Growth'].replace('[\"%"\.\""]', '', regex=True).astype(int)
df['Growth'] = df['Growth']/100
```

[ ]:
```
#check data-type of each column
df.dtypes
```

[ ]:
```
Year                          object
GDP (in billion dollars)       int32
Per Capita (in dollars)        int32
Growth                       float64
dtype: object
```

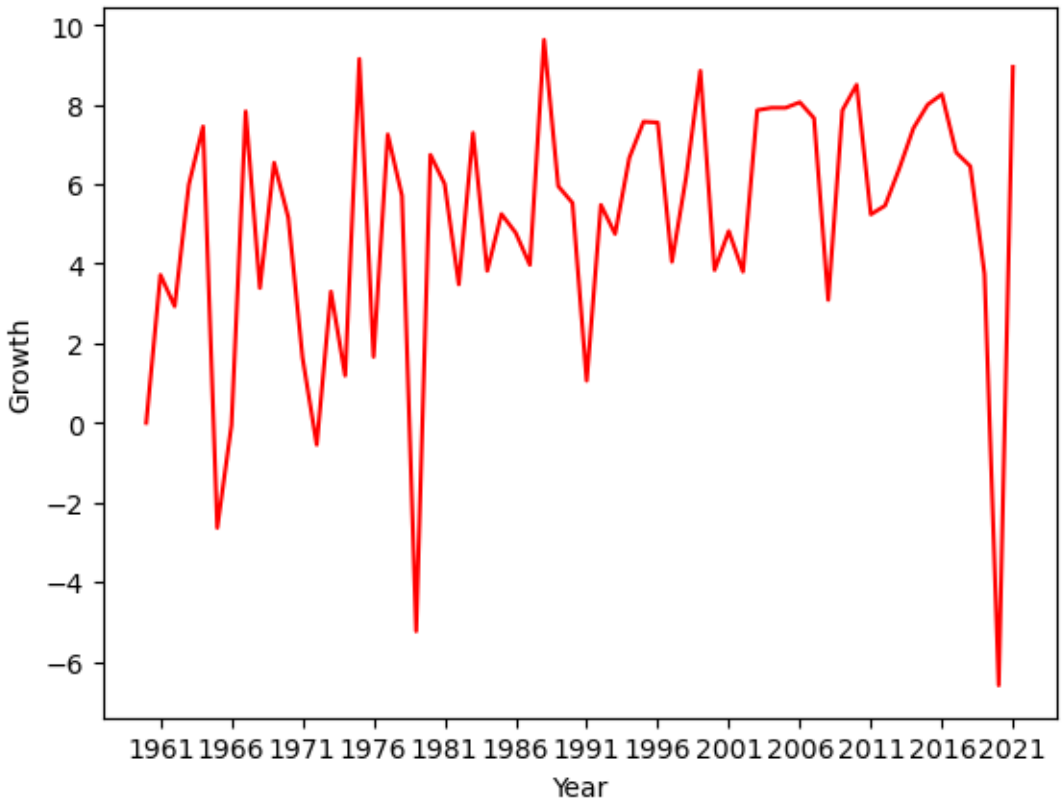
Let us visualize the data ...

[ ]:
```
sns.lineplot(data=df,x='Year',y='Growth',color='red')
plt.gca().invert_xaxis()

plt.xticks(df['Year'][::5])
```

[ ]:
```
([<matplotlib.axis.XTick at 0x205f48d8550>,
  <matplotlib.axis.XTick at 0x205f26689d0>,
  <matplotlib.axis.XTick at 0x205f48a4cd0>,
  <matplotlib.axis.XTick at 0x205f49158d0>,
  <matplotlib.axis.XTick at 0x205f4917b50>,
```

```
 <matplotlib.axis.XTick at 0x205f4921ed0>,
 <matplotlib.axis.XTick at 0x205f492c3d0>,
 <matplotlib.axis.XTick at 0x205f492e5d0>,
 <matplotlib.axis.XTick at 0x205f492d910>,
 <matplotlib.axis.XTick at 0x205f4931290>,
 <matplotlib.axis.XTick at 0x205f4933410>,
 <matplotlib.axis.XTick at 0x205f4935750>,
 <matplotlib.axis.XTick at 0x205f4937950>],
[Text(0.0, 0, '2021'),
 Text(5.0, 0, '2016'),
 Text(10.0, 0, '2011'),
 Text(15.0, 0, '2006'),
 Text(20.0, 0, '2001'),
 Text(25.0, 0, '1996'),
 Text(30.0, 0, '1991'),
 Text(35.0, 0, '1986'),
 Text(40.0, 0, '1981'),
 Text(45.0, 0, '1976'),
 Text(50.0, 0, '1971'),
 Text(55.0, 0, '1966'),
 Text(60.0, 0, '1961')])
```



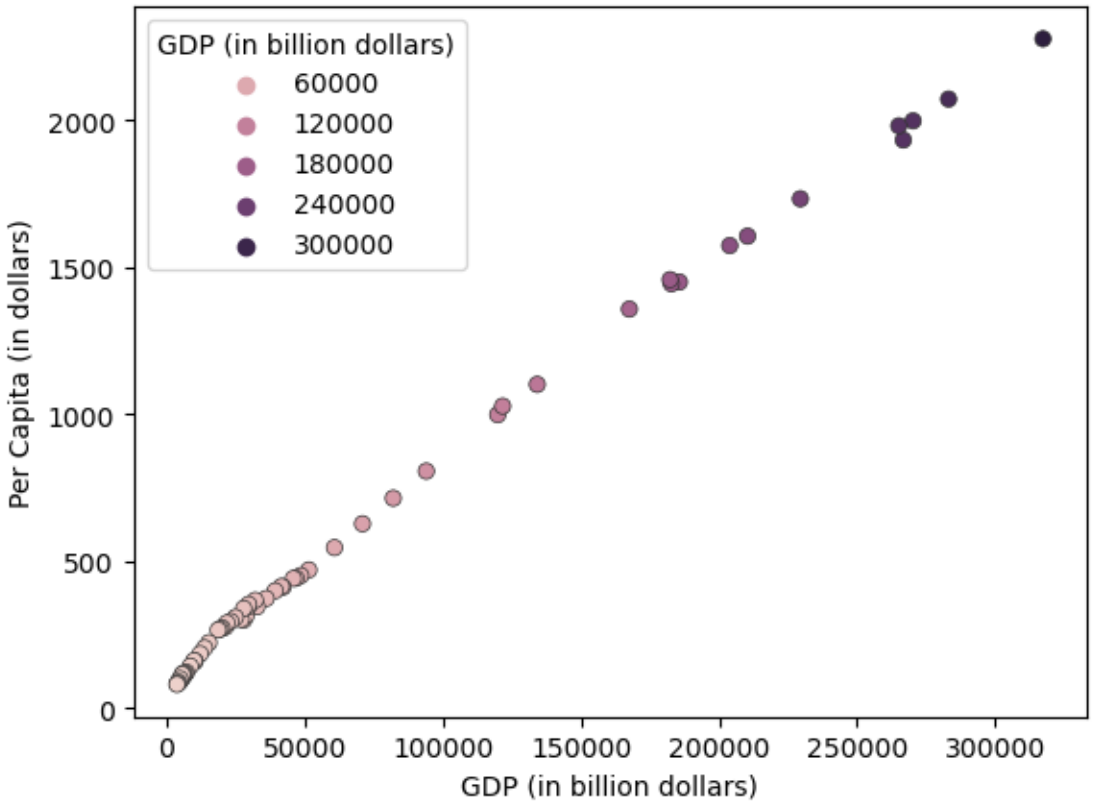
Is there a correlation between features in the dataset? ...

[ ]:
```
corr = df.corr()
corr.style.background_gradient(cmap='PiYG')
```

[ ]:
```
<pandas.io.formats.style.Styler at 0x205f4933090>
```

[ ]:
```
sns.scatterplot(data=df,x='GDP (in billion dollars)',y='Per Capita (in␣
↪dollars)',hue='GDP (in billion dollars)',edgecolor='0.2')
```

[ ]:
```
<Axes: xlabel='GDP (in billion dollars)', ylabel='Per Capita (in dollars)'>
```



We can conclude that Per Capita Income is positively correlated to Gross Domestic Product. It is 99% positively correlated. The higher the GDP increases so does the per capita income as evident in the scatterplot above.

[ ]:
```
#The growth rate in ascending order by years.

df[["Growth","Year"]].sort_values(by="Growth",ascending=True)
```

[ ]:
```
    Growth  Year
2    -6.60  2020
```

```
43   -5.24  1979
57   -2.64  1965
50   -0.55  1972
56   -0.06  1966
..     …    …
12    8.50  2010
23    8.85  1999
1     8.95  2021
47    9.15  1975
34    9.63  1988

[62 rows x 2 columns]
```

We can see that the growth was negative on 2020,1979 and 1965. The negative growth on 2020 is due to the corona virus outbreak which hit the economy hard. Whereas,severe drought affected large parts of the country which led to a decline of 10% in agricultural production.The poor performance of coal,power and rails transport affected the overall economic health of the country.With farm sector accounting for the dominant share of GDP, and given weak external balances, most recessions like the ones in 1965-1966 were driven by severe droughts or high international energy prices.

Conclusion

The Gross Domestic Product of India reached 3.4 trillion dollars ,making India the fifth larget economy in the world and it will play a crucial role in the "India Story" for the times to come.