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GDP Analysis – Assignmment

Part-I : GDP Analysis of Indian States

Part I – A

```
import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

import seaborn as sns
```

 # Data I-A

Get the data from .csv file

```
df = pd.read_csv("/Users/ArjunSinghBaghel/Documents/Data_Science/Assignment/Part_I-A/ab40c054-5031-4376-b52e-9813e776f65e.csv")

Df
```

	Items Description	Duration	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chhattisgarh	Goa	Gujarat	Haryana	...	Telangana	Tripura	Uttar Pradesh	Uttar
0	GSDP - CURRENT PRICES (` in Crore)	2011-12	379402.00	11063.00	143175.00	247144.00	158074.00	42367.00	615606.00	297539.00	...	359433.00	19208.00	724049.00	11
1	GSDP - CURRENT PRICES (` in Crore)	2012-13	411404.00	12547.00	156864.00	282368.00	177511.00	38120.00	724495.00	347032.00	...	401493.00	21663.00	822903.00	13
2	GSDP - CURRENT PRICES (` in Crore)	2013-14	464272.00	14602.00	177745.00	317101.00	206690.00	35921.00	807623.00	400662.00	...	452186.00	25593.00	944146.00	14
3	GSDP - CURRENT PRICES (` in Crore)	2014-15	526468.00	16761.00	198098.00	373920.00	234982.00	40633.00	895027.00	437462.00	...	511178.00	29667.00	1043371.00	16
4	GSDP - CURRENT PRICES (` in Crore)	2015-16	609934.00	18784.00	224234.00	413503.00	260776.00	45002.00	994316.00	485184.00	...	575631.00	NaN	1153795.00	18
5	GSDP - CURRENT PRICES (` in Crore)	2016-17	699307.00	NaN	NaN	NaN	290140.00	NaN	NaN	547396.00	...	654294.00	NaN	NaN	
6	(% Growth over previous year)	2012-13	8.43	13.41	9.56	14.25	12.30	-10.02	17.69	16.63	...	11.70	12.78	13.65	

Data Frame of Part I-A

#Remove the rows: '(% Growth over the previous year)' and 'GSDP - CURRENT PRICES (` in Crore)' for the year 2016-17.

```
indexsForDrop = df.index[((df['Items  Description'] == '(% Growth over previous year)') | (df['Items  Description'] == 'GSDP - CURRENT PRICES (` in Crore)'))& (df.Duration == '2016-17')]

newDF = df.drop(indexsForDrop)

newDF
```

	Items Description	Duration	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chhattisgarh	Goa	Gujarat	Haryana	...	Telangana	Tripura	Uttar Pradesh	Uttara
0	GSDP - CURRENT PRICES (` in Crore)	2011-12	379402.00	11063.00	143175.00	247144.00	158074.00	42367.00	615606.00	297539.00	...	359433.00	19208.00	724049.00	115
1	GSDP - CURRENT PRICES (` in Crore)	2012-13	411404.00	12547.00	156864.00	282368.00	177511.00	38120.00	724495.00	347032.00	...	401493.00	21663.00	822903.00	131
2	GSDP - CURRENT PRICES (` in Crore)	2013-14	464272.00	14602.00	177745.00	317101.00	206690.00	35921.00	807623.00	400662.00	...	452186.00	25593.00	944146.00	149
3	GSDP - CURRENT PRICES (` in Crore)	2014-15	526468.00	16761.00	198098.00	373920.00	234982.00	40633.00	895027.00	437462.00	...	511178.00	29667.00	1043371.00	161
4	GSDP - CURRENT PRICES (` in Crore)	2015-16	609934.00	18784.00	224234.00	413503.00	260776.00	45002.00	994316.00	485184.00	...	575631.00	NaN	1153795.00	184
6	(% Growth over previous year)	2012-13	8.43	13.41	9.56	14.25	12.30	-10.02	17.69	16.63	...	11.70	12.78	13.65	
7	(% Growth over previous year)	2013-14	12.85	16.38	13.31	12.30	16.44	-5.77	11.47	15.45	...	12.63	18.14	14.73	
8	(% Growth over previous year)	2014-15	13.40	14.79	11.45	17.92	13.69	13.12	10.82	9.18	...	13.05	15.92	10.51	
9	(% Growth over previous year)	2015-16	15.85	12.07	13.19	10.59	10.98	10.75	11.09	10.91	...	12.61	NaN	10.58	

Removed '% Growth over the previous year' & ''GSDP - CURRENT PRICES (` in Crore)' for 2016-17 Data Frame

 # Calculate the average growth of states over the duration 2013-14, 2014-15 and 2015-16 by taking the mean of the row '(% Growth over previous year)'. Compare the calculated value and plot it for the states.

selectedYearsDF = df[(df['Items Description'] == '(% Growth over previous year)')& ((df.Duration == '2013-14') | (df.Duration == '2014-15') | (df.Duration == '2015-16'))]

selectedYearsDF = selectedYearsDF.drop(['Chandigarh','Delhi', 'Puducherry','Andaman & Nicobar Islands'], axis=1)

SelectedYearsDF

Out[8]:

	Items Description	Duration	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chhattisgarh	Goa	Gujarat	Haryana	...	Punjab	Rajasthan	Sikkim	Tamil Nadu	Telangana	Tripura	F
7	(% Growth over previous year)	2013-14	12.85	16.38	13.31	12.30	16.44	-5.77	11.47	15.45	...	12.42	11.27	12.35	13.51	12.63	18.14	
8	(% Growth over previous year)	2014-15	13.40	14.79	11.45	17.92	13.69	13.12	10.82	9.18	...	9.95	11.37	9.72	12.51	13.05	15.92	
9	(% Growth over previous year)	2015-16	15.85	12.07	13.19	10.59	10.98	10.75	11.09	10.91	...	NaN	NaN	9.39	10.99	12.61	NaN	

3 rows × 32 columns

Selecte '% Growth over previous year' for years '2013-14', '2014-15', '2015-16' DataFrame

 # Calculate mean

averageGrowthDf = pd.DataFrame(selectedYearsDF.mean())

averageGrowthDf.rename(columns={0: 'Growth_Mean'}, inplace=True)

averageGrowthDf = averageGrowthDf.dropna()

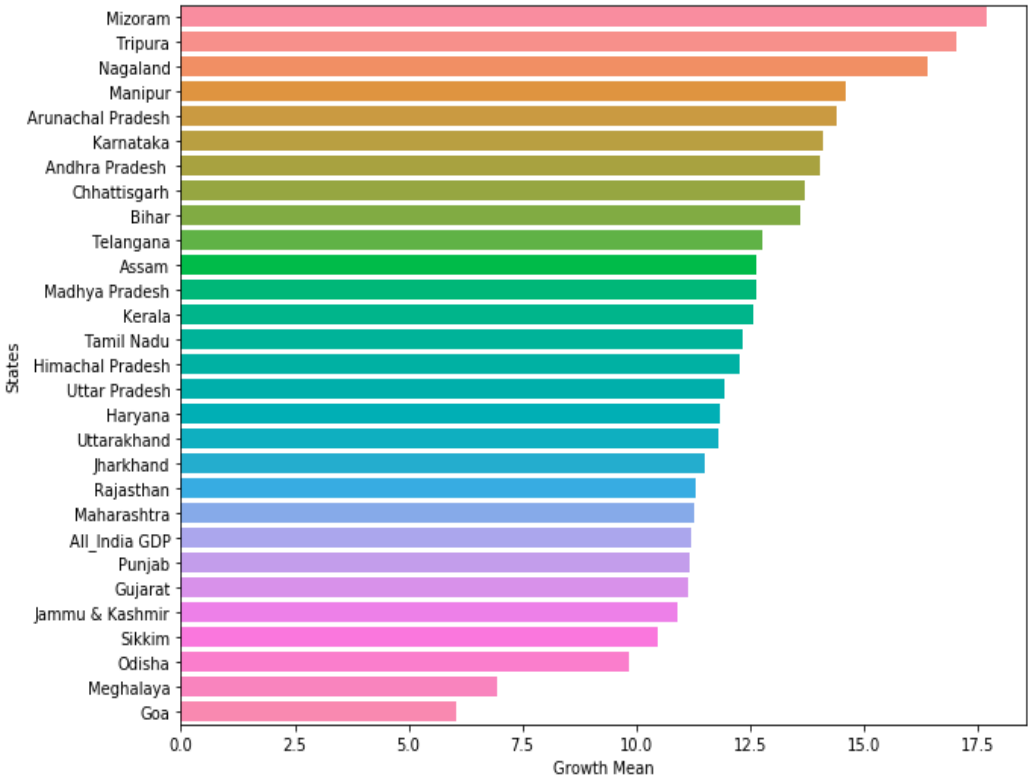
averageGrowthDf = averageGrowthDf.sort_values(by='Growth_Mean', ascending=False) #Sorting

	Growth_Mean
Mizoram	17.700000
Tripura	17.030000
Nagaland	16.415000
Manipur	14.610000
Arunachal Pradesh	14.413333
Karnataka	14.120000
Andhra Pradesh	14.033333
Chhattisgarh	13.703333
Bihar	13.603333
Telangana	12.763333
Assam	12.650000
Madhya Pradesh	12.626667
Kerala	12.583333
Tamil Nadu	12.336667
Himachal Pradesh	12.280000
Uttar Pradesh	11.940000
Haryana	11.846667
Uttarakhand	11.803333
Jharkhand	11.500000
Rajasthan	11.320000
Maharashtra	11.260000
All_India GDP	11.203333

Calculated Mean Data Frame

 # Plot for growth mean using barplot

```
plt.figure(figsize=(10,8))
sns.barplot(x=averageGrowthDf['Growth_Mean'], y=averageGrowthDf.index)
plt.xlabel('Growth Mean')
plt.ylabel('States')
plt.show()
```



Growth Mean Plot of States

 # Question: Which states have been growing consistently fast, and which ones have been struggling?

 # Answer: Manipur growing consistently fast. Goa have been struggling

 # Question: Curiosity exercise - what has been the average growth rate of your home state, and how does it compare to the national average over this duration?

 # Answer:

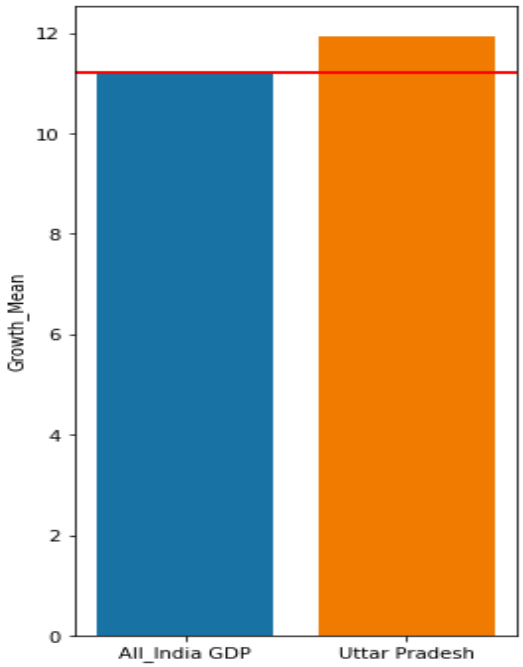
1- My home state is Uttar Pradesh and average growth is 11.940000.

2- Natioal average growth rate is 11.203333, so national average growth rate is 0.736667 less than uttar pardesh average growth rate.

```
plt.figure(figsize=(4,8))

sns.barplot(x=averageGrowthDf.loc[['All_India GDP','Uttar Pradesh']].index, y = 'Growth_Mean',
data = averageGrowthDf.loc[['All_India GDP','Uttar Pradesh']])

plt.axhline(y=averageGrowthDf.loc['All_India GDP','Growth_Mean'], linewidth=2, color='r')
```



Plot of average growth rate of Uttar Pradesh & All India

 # Plot the total GDP of the states for the year 2015-16:

```
GDPOfStates = df[(df['Items  Description'] == 'GSDP - CURRENT PRICES (` in Crore)') &
(df.Duration == '2015-16')]

GDPOfStates = GDPOfStates.drop(['Chandigarh','Delhi', 'Puducherry'], axis=1)

 GDPOfStates = GDPOfStates.drop(['Items  Description','Duration'],axis=1)

 GDPOfStates_df1_transposed = GDPOfStates.T

GDPOfStates_df1_transposed.rename(columns={4: 'GDP'}, inplace=True)

GDPOfStates_df1_transposed = GDPOfStates_df1_transposed.sort_values(by='GDP',
ascending=False) #Sorting
```

```
GDPOfStates_df1_transposed = GDPOfStates_df1_transposed.dropna() # drop NaN
GDPOfStates_df1_transposed = GDPOfStates_df1_transposed.drop(['All_India GDP'])
 GDPOfStates_df1_transposed
```

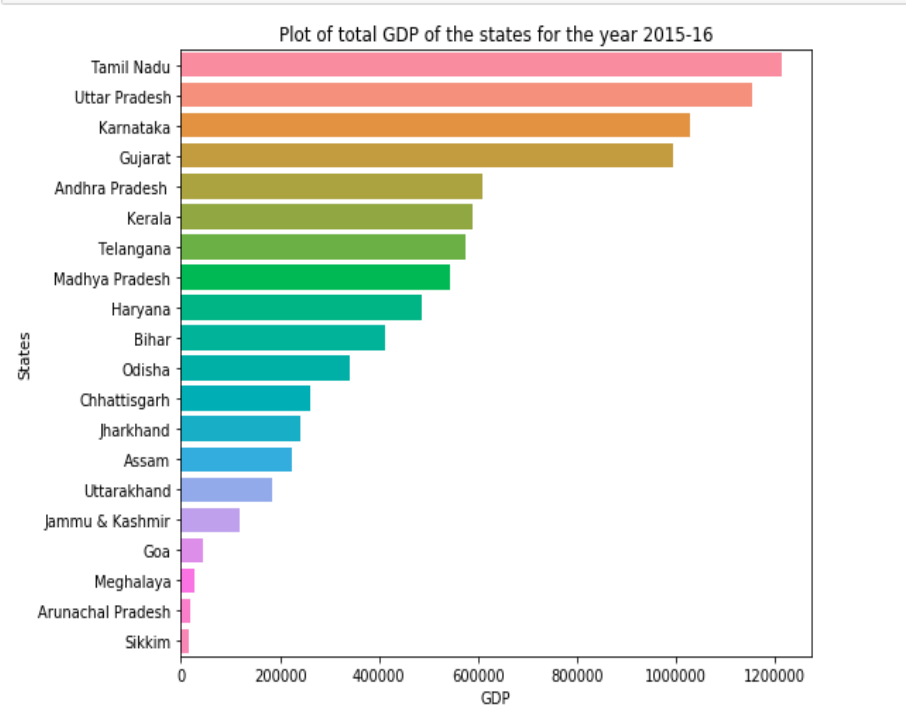
24]:

	GDP
Tamil Nadu	1212668.0
Uttar Pradesh	1153795.0
Karnataka	1027068.0
Gujarat	994316.0
Andhra Pradesh	609934.0
Kerala	588337.0
Telangana	575631.0
Madhya Pradesh	543975.0
Haryana	485184.0
Bihar	413503.0
Odisha	341887.0
Chhattisgarh	260776.0
Jharkhand	241955.0
Assam	224234.0
Uttarakhand	184091.0
Jammu & Kashmir	118387.0
Goa	45002.0

Total GDP of states for year 2015-16 Data Frame

 # Plot of total GDP of the states for the year 2015-16

```
plt.figure(figsize=(8,7))
sns.barplot(x= GDPOfStates_df1_transposed['GDP'] , y= GDPOfStates_df1_transposed.index )
plt.title('Plot of total GDP of the states for the year 2015-16')
plt.ylabel('States')
plt.show()
```

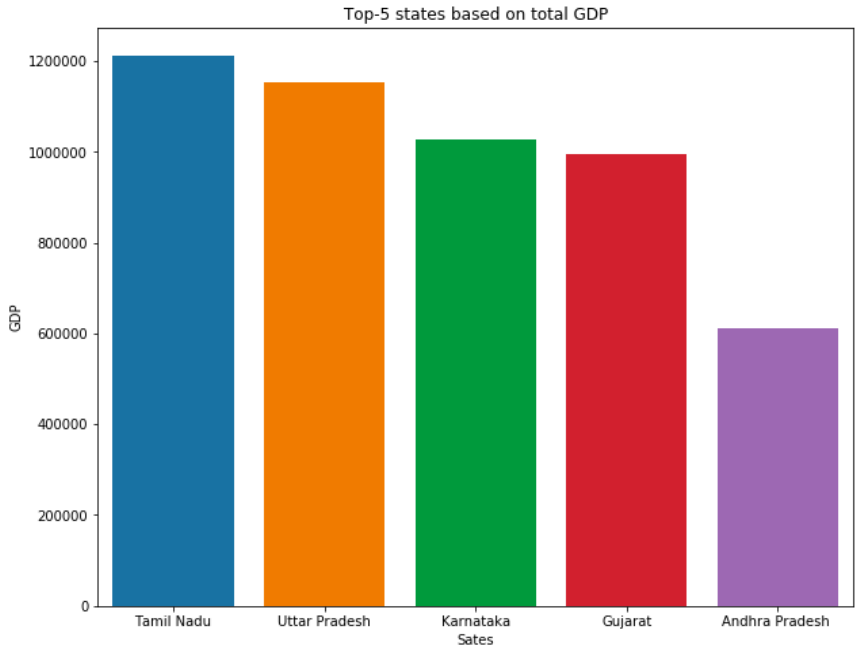


Plot of total GDP of the states for the year 2015-16

 # Top-5 states based on total GDP

```
top5 = GDPOfStates_df1_transposed.head(5) #  Top 5 GDP
print(top5)
 plt.figure(figsize=(10,8))
sns.barplot(x=top5.index, y=top5.GDP)
plt.title('Top-5 states based on total GDP')
plt.xlabel('Sates')
plt.show()
```

```
                      GDP
Tamil Nadu       1212668.0
Uttar Pradesh    1153795.0
Karnataka        1027068.0
Gujarat           994316.0
Andhra Pradesh    609934.0
```

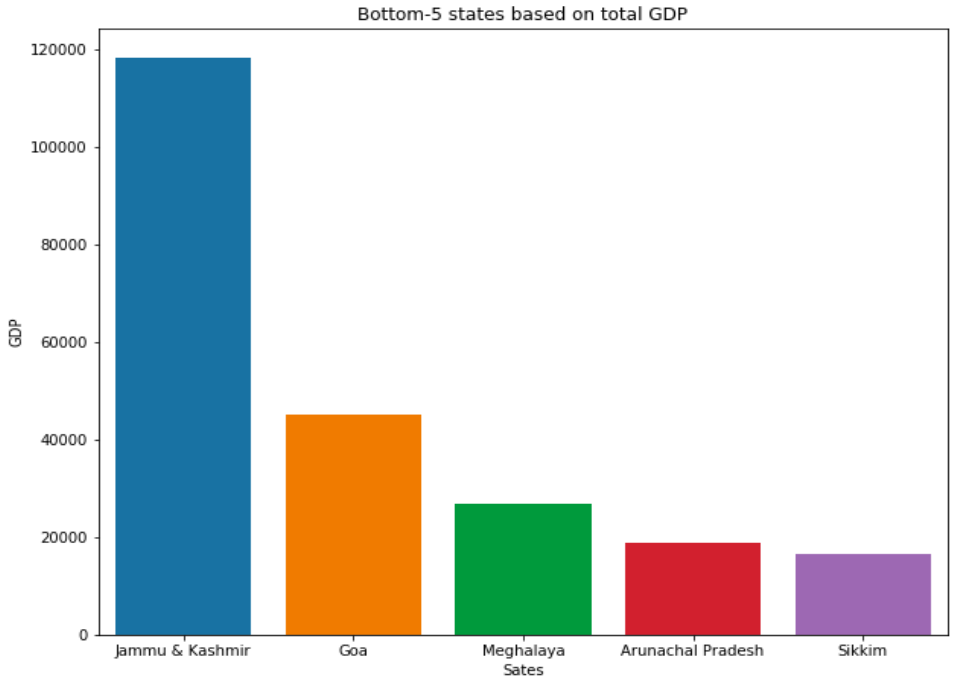


Plot of Top-5 Sates based on total GDP

 # Bottom-5 states based on total GDP

```
bottom5 = GDPOfStates_df1_transposed.tail(5) #  bottom 5 GDP
print(bottom5)
 plt.figure(figsize=(10,8))
sns.barplot(x=bottom5.index, y=bottom5.GDP)
plt.title('Bottom-5 states based on total GDP')
plt.xlabel('Sates')
plt.show()
```

	GDP
Jammu & Kashmir	118387.0
Goa	45002.0
Meghalaya	26745.0
Arunachal Pradesh	18784.0
Sikkim	16637.0



Plot of bottom-5 based on total GDP