GDP Analysis

Project Brief

You are working as the chief data scientist at NITI Aayog, reporting to the CEO. The CEO has initiated a project wherein the NITI Aayog will provide top-level recommendations to the Chief Ministers (CMs) of various states, which will help them priorities areas of development for their respective states. Since different states are in different phases of development, the recommendations should be specific to the states.

The overall goal of this project is to help the CMs focus on areas that will foster economic development for their respective states. Since the most common measure of economic development is the GDP, you will analyses the GDP of the various states of India and suggest ways to improve it.

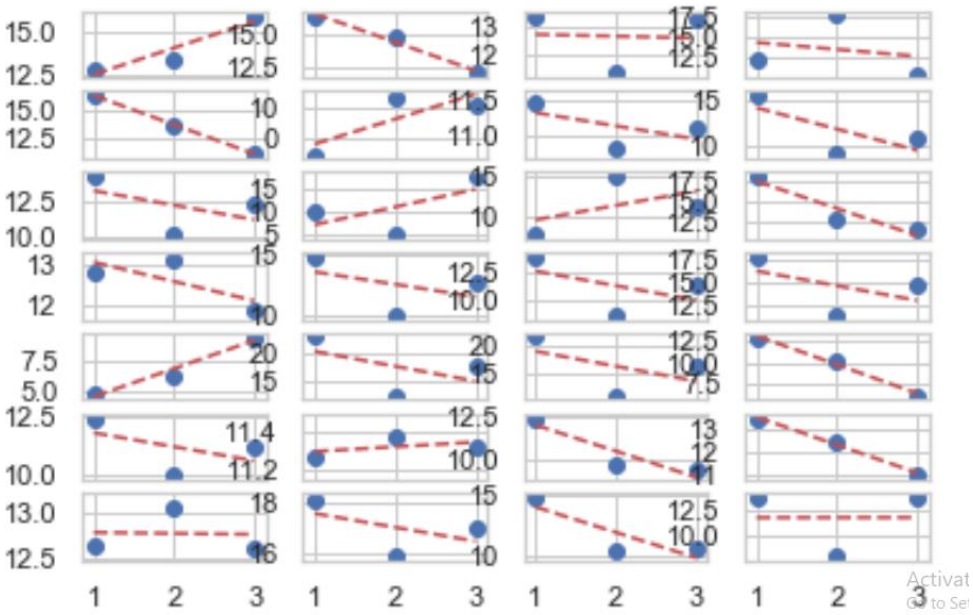
India ranks 11th in the world in terms of total GDP; however, it lies at the 139th position in terms of per capita GDP.

Part-I: GDP Analysis of the Indian States

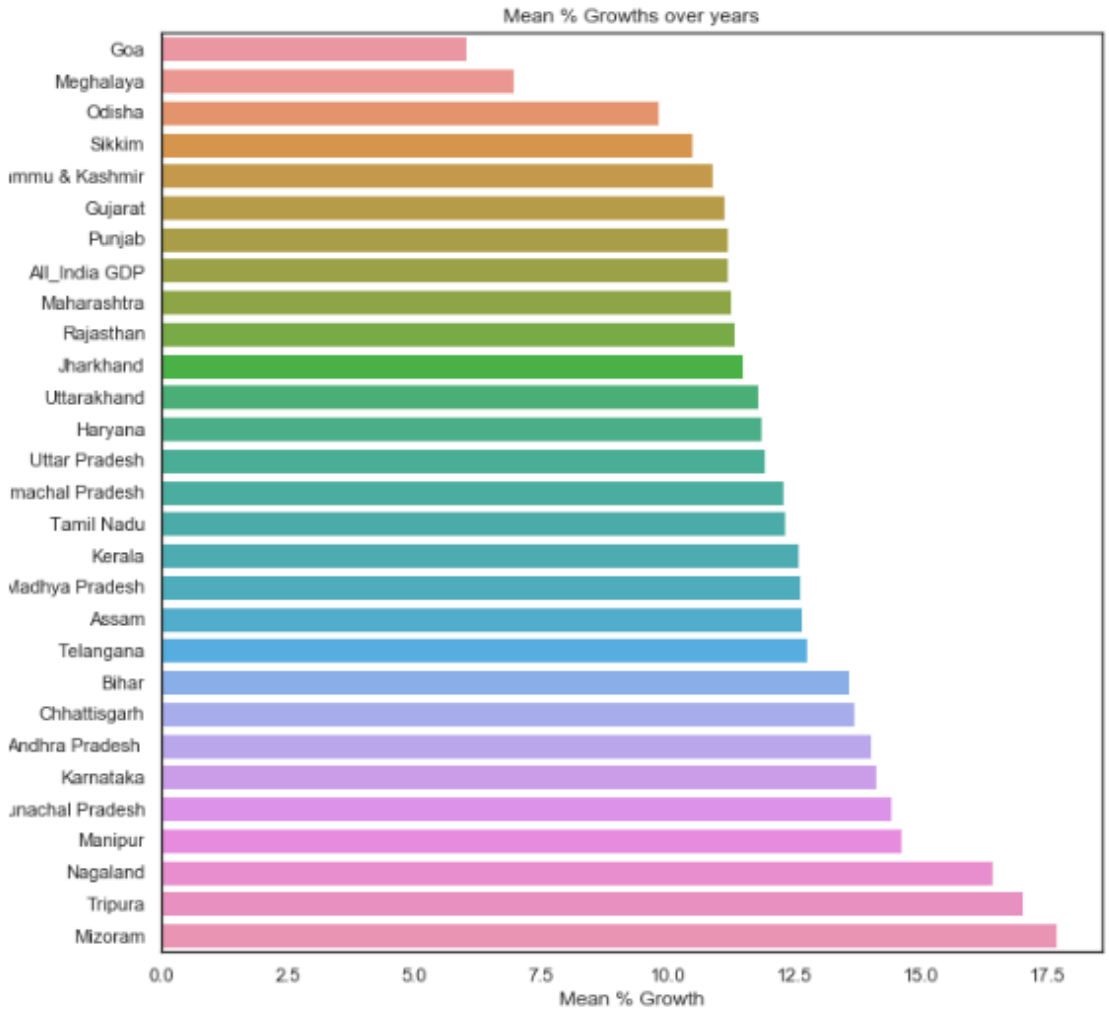
Part I-A:

% Growth over previous year" for all the states

- **Below is best fit line plot for the % Growth over previous year" for all the states**



- **Below is bar graph for Mean % Growth over years:**



- **How will you compare the growth rates of any two states?**

  As per above graph we can compare the growth rate of any two states

- **Which states have been growing consistently fast, and which ones have been struggling? Rank top 3 fastest and 3 slowest-growing states.**

  <u>Top 3 fastest growing states</u>: Mizoram, Nagaland and Tripura

  <u>Slowest 3 -growing states</u>: Goa, Meghalaya and Odisha

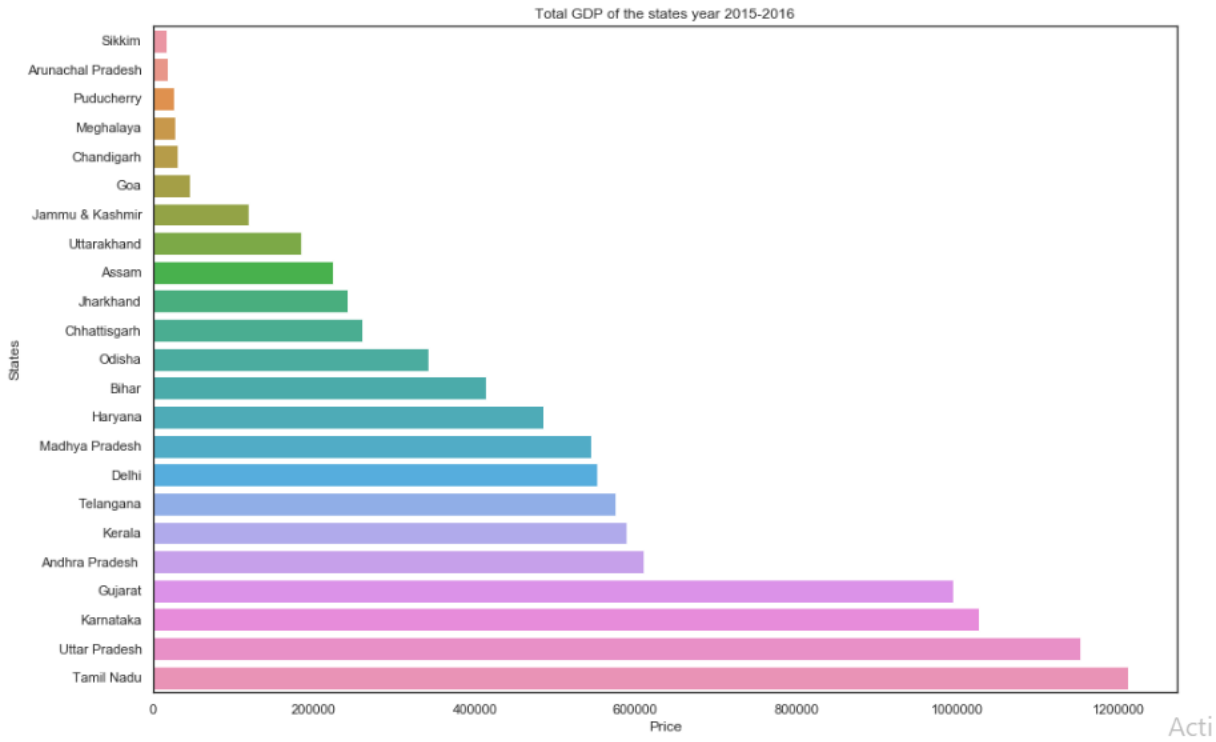
- **What is the Nation's growth rate?**

  All_India GDP- 11.20

- **What has been the growth rate of your home state, and how does it compare to the national growth rate?**

  11.94 for Uttar Pradesh. 0.74 is more as compare to All_India GDP- 11.20

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



- **Which Plot will you use for this? Why? (Remeber to plot the graph in a way such as it is easier to read and compare)**

  I used the bar graph to plot total GDP of the states for the year 2015-16

- **Identify the top 5 and the bottom 5 states based on total GDP.**

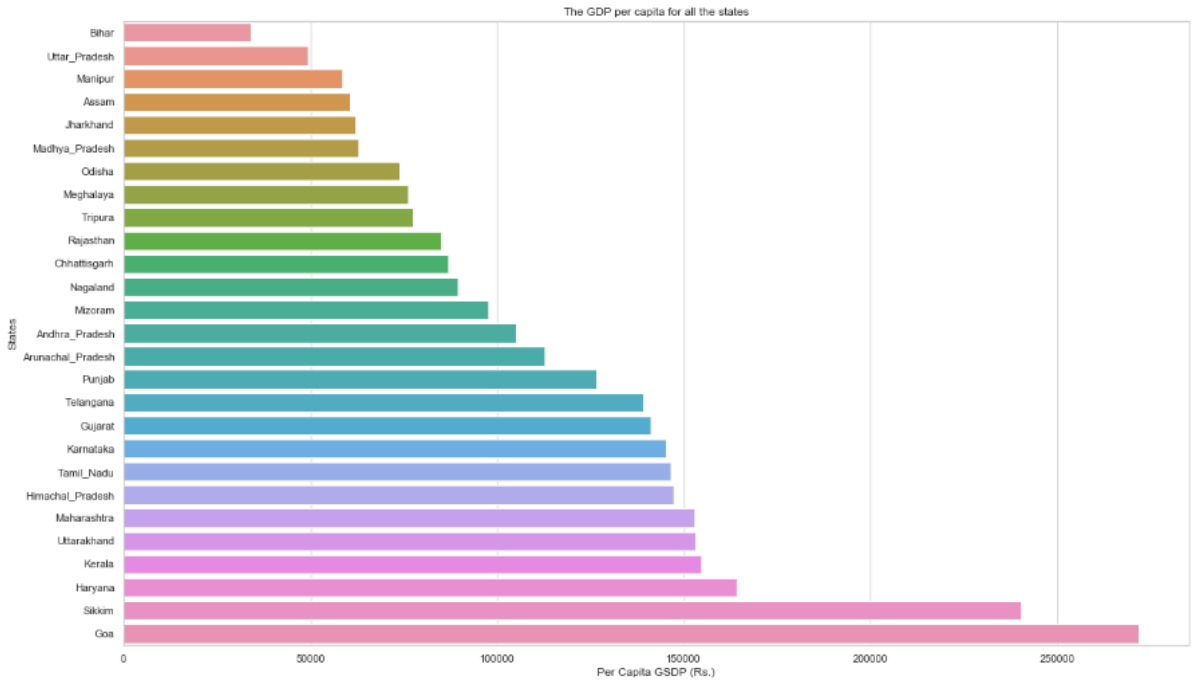
  <u>Top 5 States</u>: Tamil Nadu, Uttar Pradesh, Karnataka, Gujarat and Andhra Pradesh
  <u>Bottom 5 States</u>: Sikkim, Arunachal Pradesh, Puduchery, Meghalaya and Chandigarh

- **What insights can you draw from this graph? What states are performing poorly? (Remember: this will not be solely based on total GDP)**

  Goa and Meghalaya states are performing poorly.

Part I-B:

- **Plot the GDP per capita for all the states.**



- **Identify the top 5 and the bottom 5 states based on the GDP per capita.**

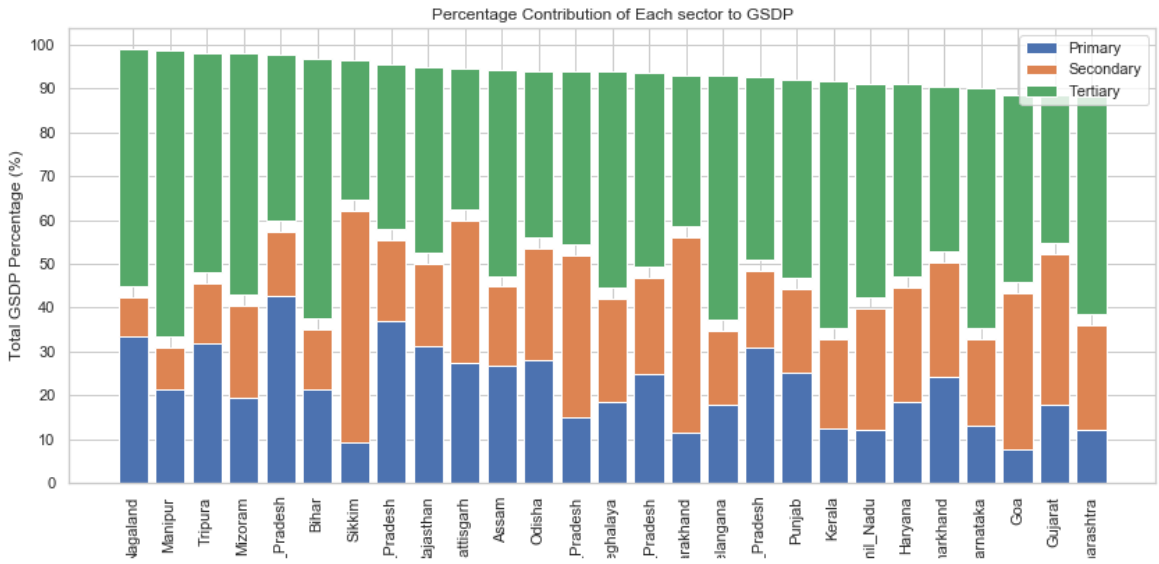
  Top-5 states : Uttarkand, Kerala, Haryana, Sikkim and Goa

  Bottom-5 states: Bihar, Uttar Pradesh, Manipur, Assam and Jharkhand

- **Find the ratio of the highest per capita GDP to the lowest per capita GDP**

  8.0047

- **Plot the percentage contribution of the primary, secondary and tertiary sectors as a percentage of the total GDP for all the states.**



- **Which plot will you use here? Why?**

  Here I plotted the graph using Stacked Bar plot and required the total contribution of all the sector as total.

- **Why is (Primary + Secondary + Tertiary) not equal to total GDP?**

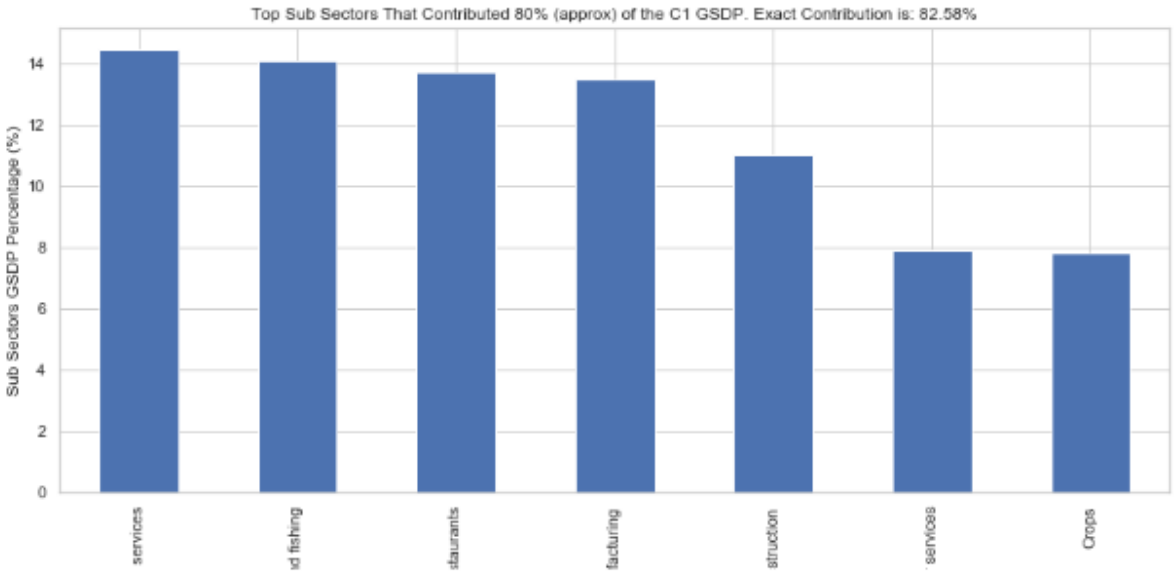
  As per GDP can see that some states not contributing part of the total GDP.

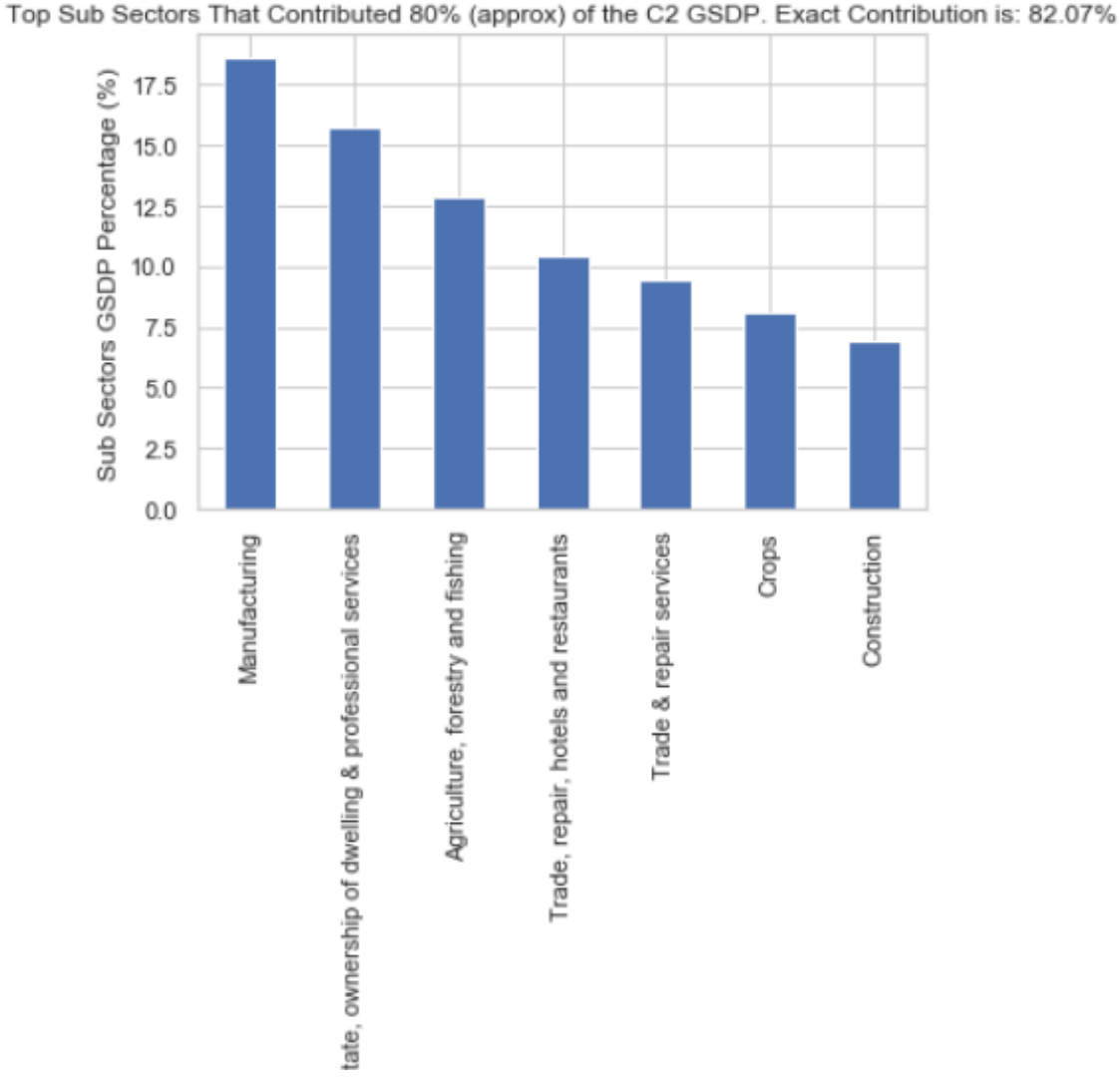
- **Can you draw any insight from this? Find correlation of percentile of the state (% of states with lower per capita GDP) and %contribution of Primary sector to total GDP.**

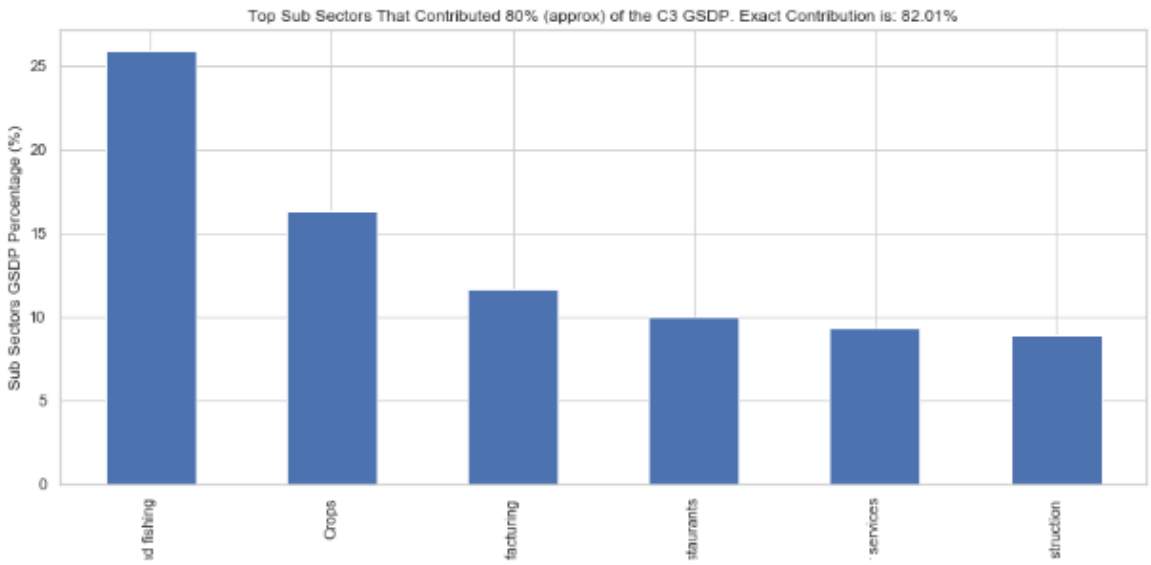
  Minus 61 percent of the correlation of percentile of the state (% of states with lower per capita GDP) and %contribution of Primary sector to total GDP

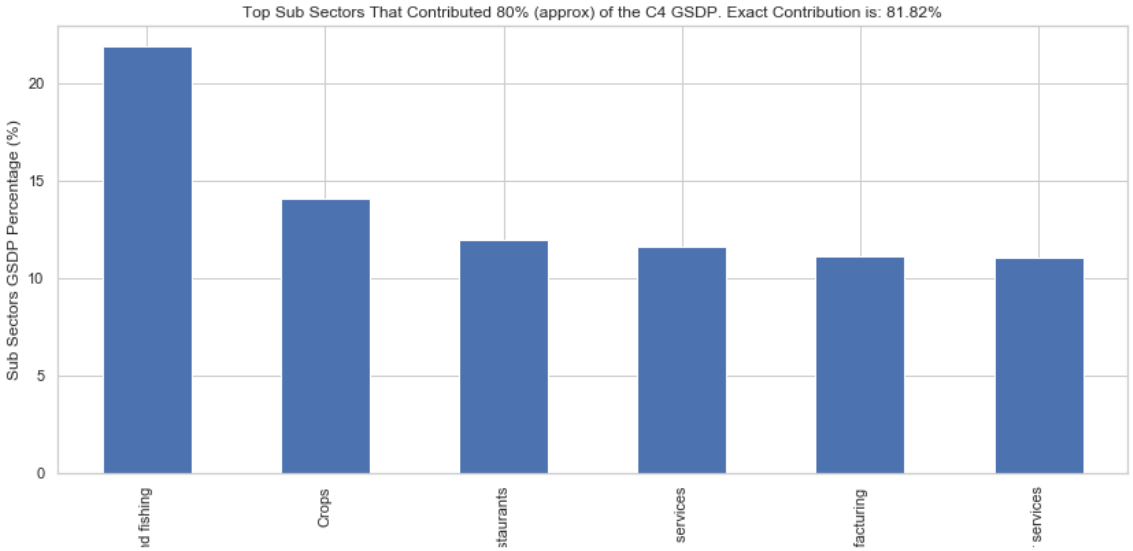
- **Categorise the states into four groups based on the GDP per capita (C1, C2, C3, C4, where C1 would have the highest per capita GDP and C4, the lowest). The quantile values are (0.20,0.5, 0.85, 1), i.e., the states lying between the 85th and the 100th percentile are in C1; those between the 50th and the 85th percentiles are in C2, and so on.**
- **Find the top 3/4/5 sub-sectors (such as agriculture, forestry and fishing, crops, manufacturing etc., not primary, secondary and tertiary) that contribute to approximately 80% of the GSDP of each category.**

- **Plot the contribution of the sub-sectors as a percentage of the GSDP of each category.**


Top Sub Sectors That Contributed 80% (approx) of the C1 GSDP. Exact Contribution is: 82.58%
Sub Sectors GSDP Percentage (%)
0
2
4
6
8
10
12
14
services
id fishing
staurants
facturing
struction
services
Crops


Top Sub Sectors That Contributed 80% (approx) of the C2 GSDP. Exact Contribution is: 82.07%
Sub Sectors GSDP Percentage (%)
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
Manufacturing
tate, ownership of dwelling & professional services
Agriculture, forestry and fishing
Trade, repair, hotels and restaurants
Trade & repair services
Crops
Construction





- **How does the GDP distribution of the top states (C1) differ from the others?**
  - **i) Average of C1 GSDP: 25482669 , Per-capita AVG of C1 : 207730**
  - **ii) Average of C2 GSDP: 65153384 , Per-capita AVG of C2 : 140503**
  - **iii) Average of C3 GSDP: 25129395 , Per-capita AVG of C3 : 83836**
  - **iv) Average of C4 GSDP: 37010779 , Per-capita AVG of C4 : 52912**

- **Which sub-sectors seem to be correlated with high GDP?**

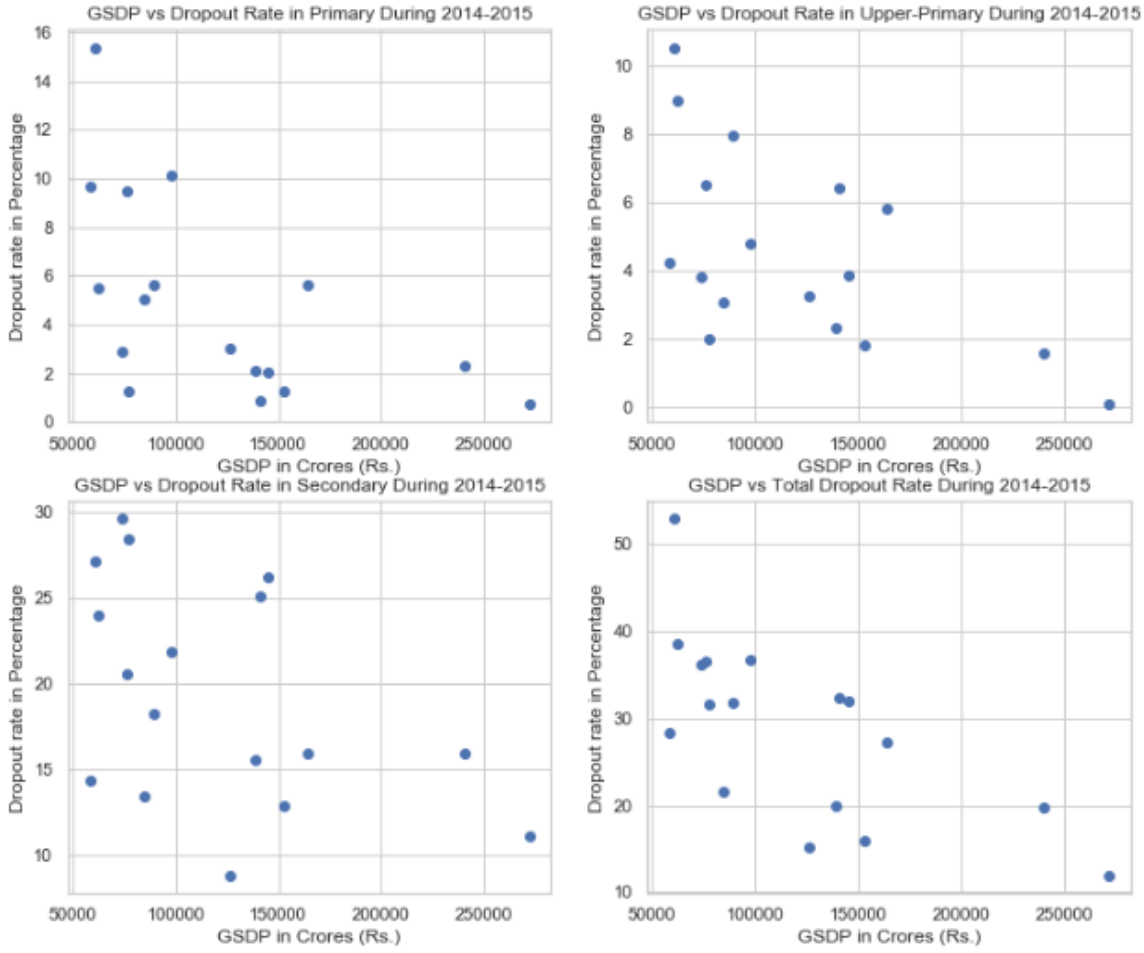
Item	2014-15
Gross State Domestic Product	1.099530e+09
TOTAL GSVA at basic prices	1.008023e+09
Tertiary	5.064437e+08
Secondary	2.851220e+08
Primary	2.164573e+08
Agriculture, forestry and fishing	1.885628e+08
Manufacturing	1.699807e+08
Real estate, ownership of dwelling & professional services	1.472633e+08
Taxes on Products	1.217224e+08
Trade, repair, hotels and restaurants	1.199639e+08
Crops	1.185200e+08

- **Which sub-sectors do the various categories need to focus on?**
  - **C1: ['Railways' 'Services incidental to transport' 'Air transport' 'Water transport' 'Storage']**
  - **C2: ['Services incidental to transport' 'Air transport' 'Storage' 'Water transport' 'Road transport*']**
  - **C3: ['Services incidental to transport' 'Water transport' 'Storage' 'Services incidental to transport*' 'Air transport']**
  - **C4: ['Hotels & restaurants' 'Services incidental to transport' 'Storage''Air transport' 'Water transport']**

Part-II: GDP and Education Dropout Rates

In Part-I, you would have noticed that (one) way to increase per capita GDP is by shifting the distribution of GDP towards the secondary and tertiary sectors, i.e., the manufacturing and services industries. But these industries can thrive only when there is an availability of educated and skilled labour.

Part-II: GDP and Education:



I can observer that all states Per capita less than 150000 are majorly those having drop out more than 15.

I can say that - increase the per capita if decrease the dropout rate below 15

Steps to achieve above analysis are:

- ✓ **For all above analysis I used Python.**
- ✓ **Imported the data and category wise as explain in Project.**
- ✓ **Data cleaning is important as Like West Bengal and year 2015-16 does not have max. value in data set.**
- ✓ **Once data cleaning done then Started to explore the data via plotting the graph.**
- ✓ **As we have given some condition which I have taken care why I was plotting the graph.**
- ✓ **Then did analysis for this GDP Assignment.**