

## **Assignment: GDP Analysis**

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# Assignment: GDP Analysis

## DATA UNDERSTANDING

# Assignment: GDP Analysis

The data for GDP analysis of the Indian states is divided into two parts:

- **Data I-A:** This dataset consists of the GSDP (Gross State Domestic Product) data for the states and union territories.
- **Data I-B:** This dataset contains the distribution of GSDP among three sectors: the primary sector (agriculture), the secondary sector (industry) and the tertiary sector (services) along with taxes and subsidies. There is separate dataset for each of the states.

I am expected to read the dataset for the available states and join these (in Python) if needed.

- There are two parts to this project. In the first part, you will analyse and compare the GDPs of various Indian states (both total and per capita).
- The GDP of a state is referred to as **the GSDP (Gross State Domestic Product)**. Then, I will divide the states into four categories based on the GDP per capita, and for each of these four categories, you will analyse the sectors that contribute the most to the GDP (such as agriculture, real estate, manufacturing, etc.).

In the second part, you will analyse whether GDP per capita is related to dropout rates in schools and colleges

# Assignment: GDP Analysis

**PART-IA**

# Assignment: GDP Analysis

## Part I-A:

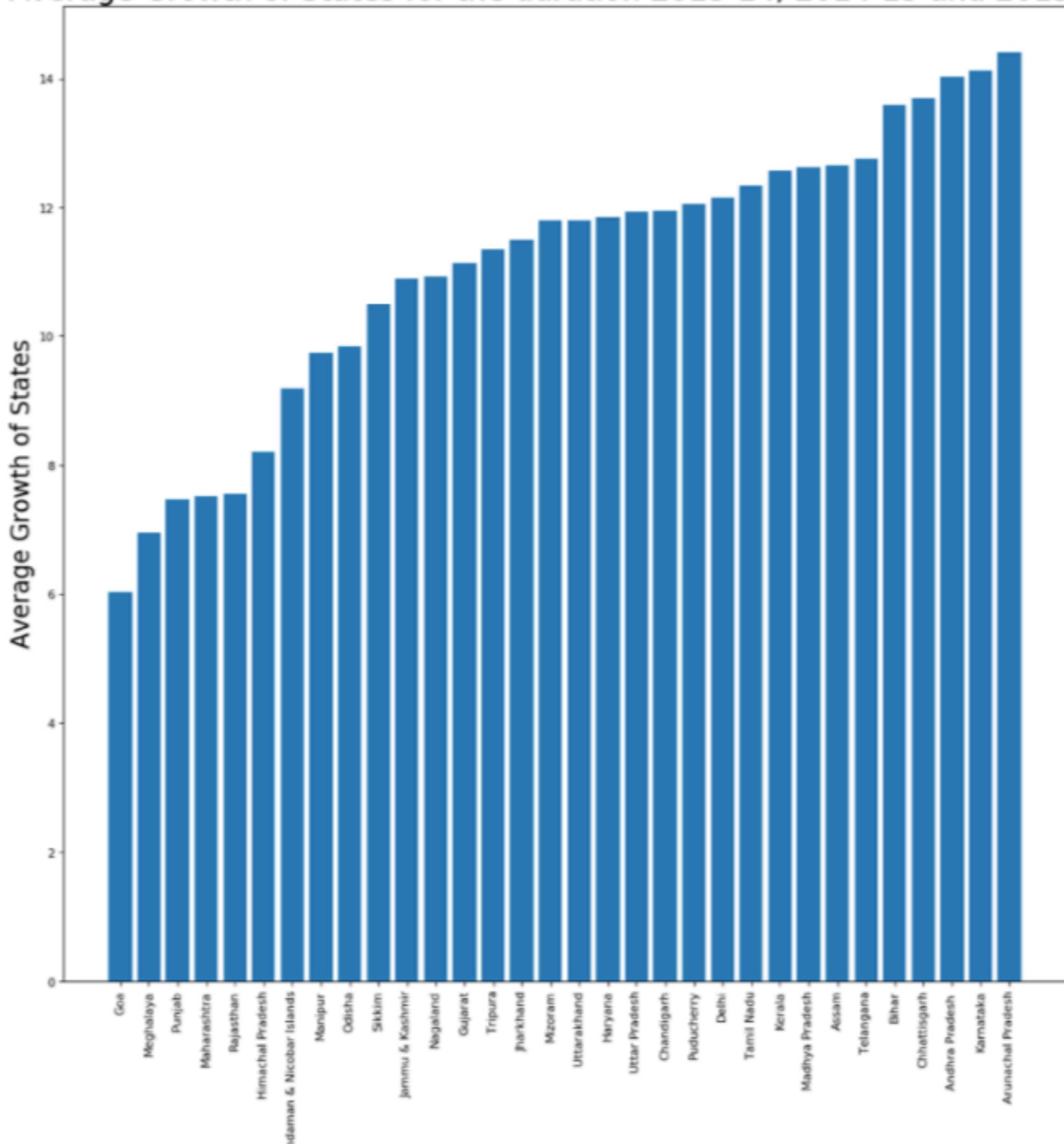
- For the analysis **Data I-A** is used.
- Calculate the average growth of states for the duration 2013-14, 2014-15 and 2015-16 by taking the mean of the row '(% Growth over previous year)'. Compare the calculated values and plot them for the states. Make appropriate transformations, if necessary, to plot the data. Report the average growth rates of the various states:
  - Which states have been growing consistently fast, and which ones have been struggling?
  - 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?
- Plot the total GDP of the states for the year 2015-16:
  - Identify the top 5 and the bottom 5 states based on total GDP.

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**Visualisations**

# Assignment: GDP Analysis

Average Growth of States for the duration 2013-14, 2014-15 and 2015-16



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## Analysis

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

The states that have been growing consistently fast are:

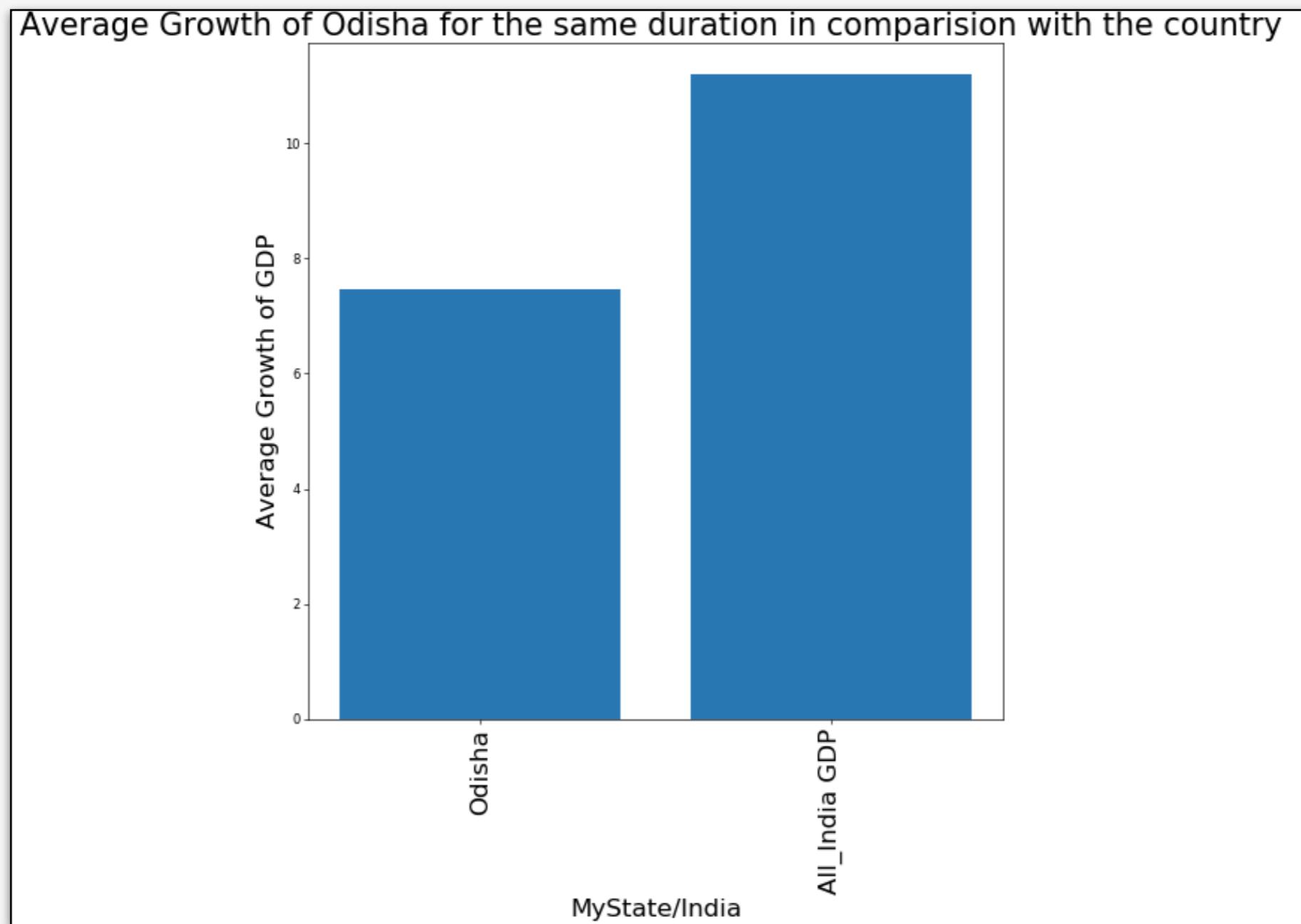
1. Arunachal Pradesh
2. Karnataka
3. Andhra Pradesh
4. Chattisgarh

And which ones have been struggling are as follows:

1. Goa
2. Meghalay
3. Punjab
4. Maharashtra

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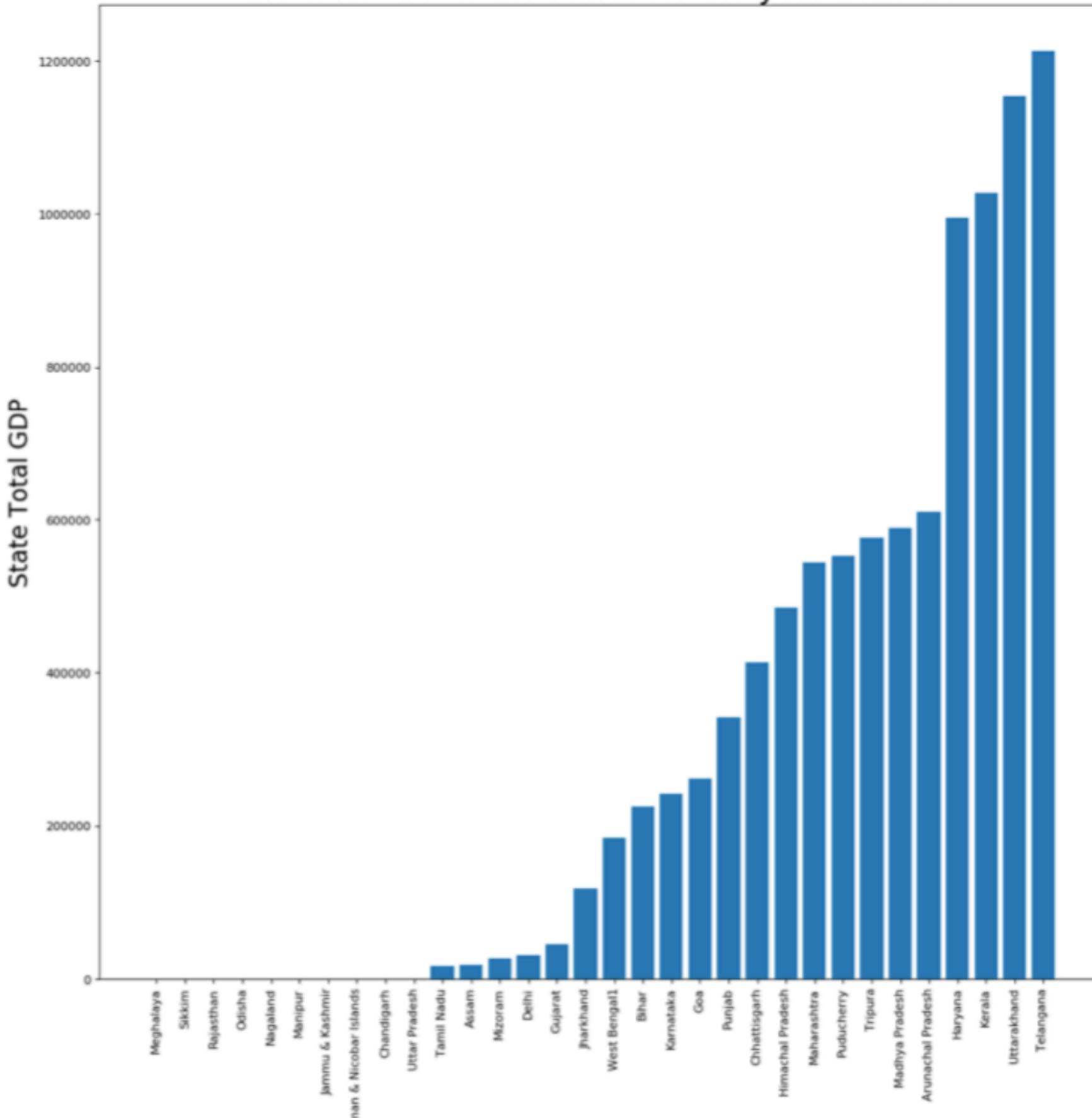
- Curiosity exercise: What has been the average growth rate of your home state, and how does it compare to the national average over 2013-2016?



The average growth rate of odisha is 7.46 and is 33.4 % lower than the average growth of the country.

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



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

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

The Top 5 States are:

- Telengana
- Uttarakhand
- Kerala
- Haryana
- Arunachal Pradesh

The bottom 5 States are:  
(excluding the states with total GDP = 0)

- Tamil Nadu
- Assam
- Mizoram
- Delhi
- Gujarat

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**PART-IB**

# Assignment: GDP Analysis

## Part I-B:

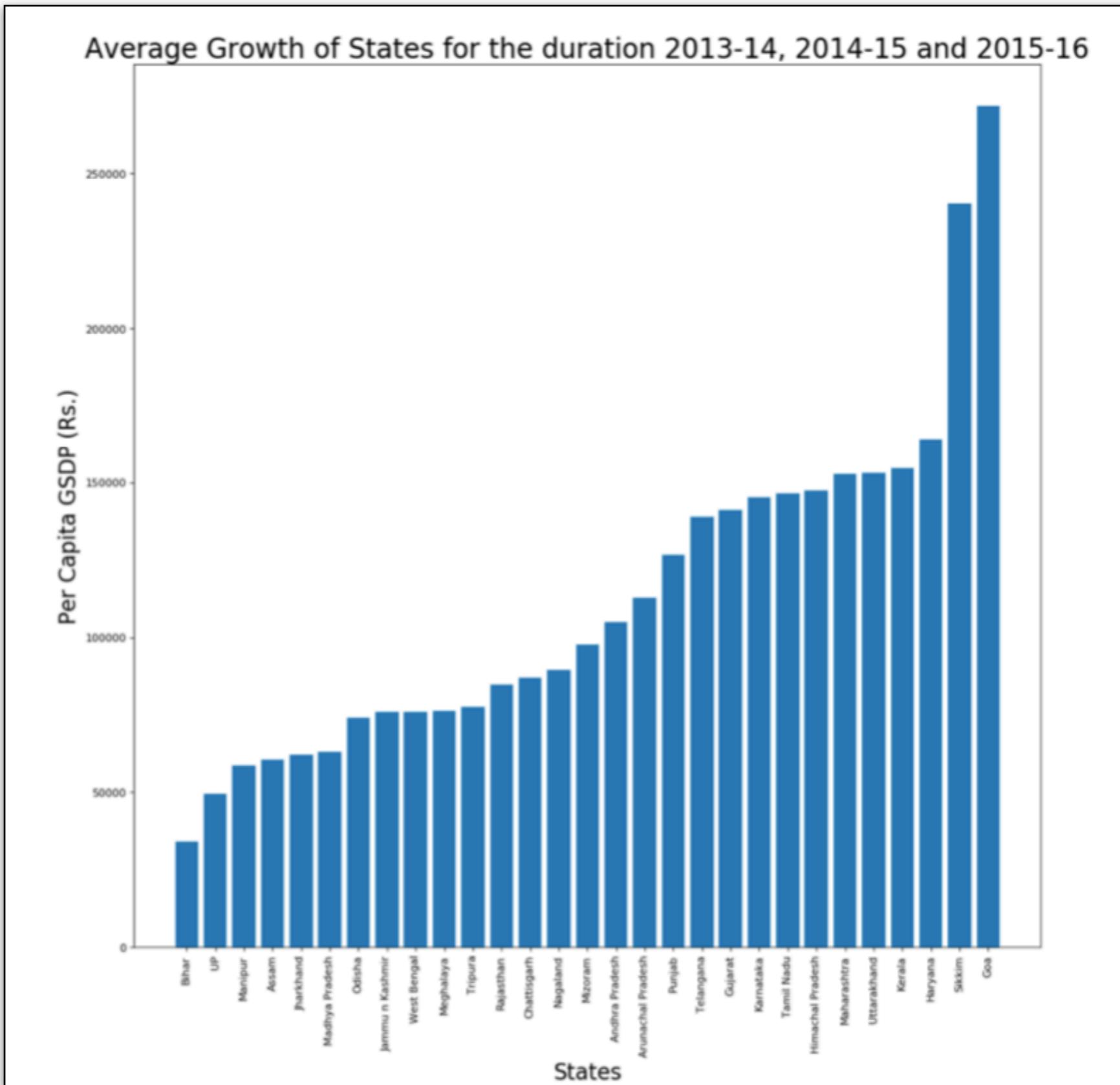
- Use **Data I-B**. Perform the analysis only for the duration 2014-15.
- Plot the GDP per capita for all the states.
  - Identify the top 5 and the bottom 5 states based on the GDP per capita.
  - Find the ratio of the highest per capita GDP to the lowest per capita GDP.
- Plot the percentage contribution of the primary, secondary and tertiary sectors as a percentage of the total GDP for all the states.
- 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)
  - For each category (C1, C2, C3, C4):
    - 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.

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**Visualisations**

# Assignment: GDP Analysis

Plot the GDP per capita for all the states.



## Analysis

Q) Identify the top 5 and the bottom 5 states based on the GDP per capita.

The top five states based on the GDP per capita are:

- Goa
- Sikkim
- Haryana
- Kerala
- Uttarakhand

The Bottom five states based on the GDP per capita are:

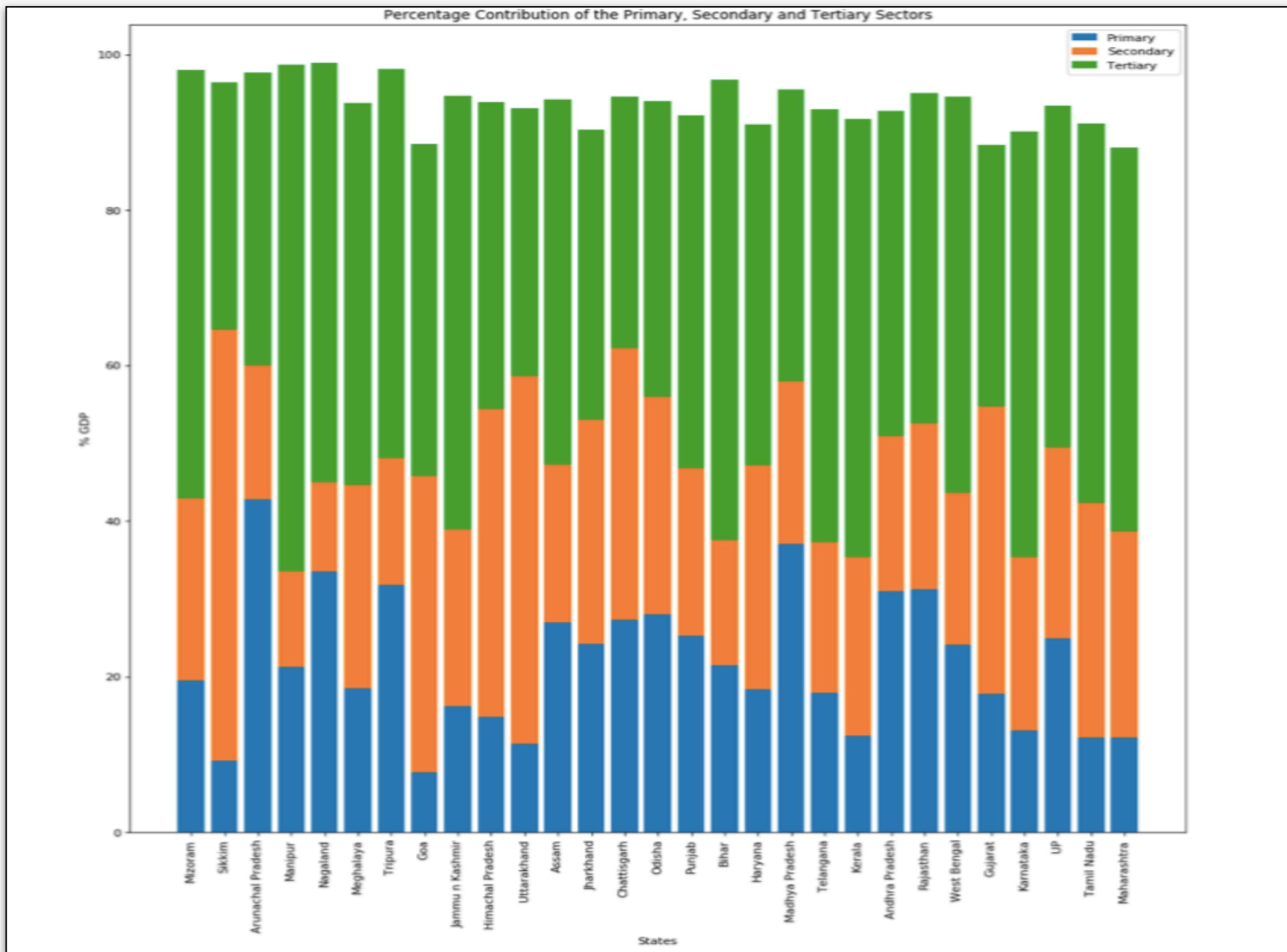
- Bihar
- Uttar Pradesh
- Manipur
- Assam,
- Jharkhand

Q) Find the ratio of the highest per capita GDP to the lowest per capita GDP.

The ratio of the highest per capita GDP to the lowest per capita GDP is 8

# Assignment: GDP Analysis

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



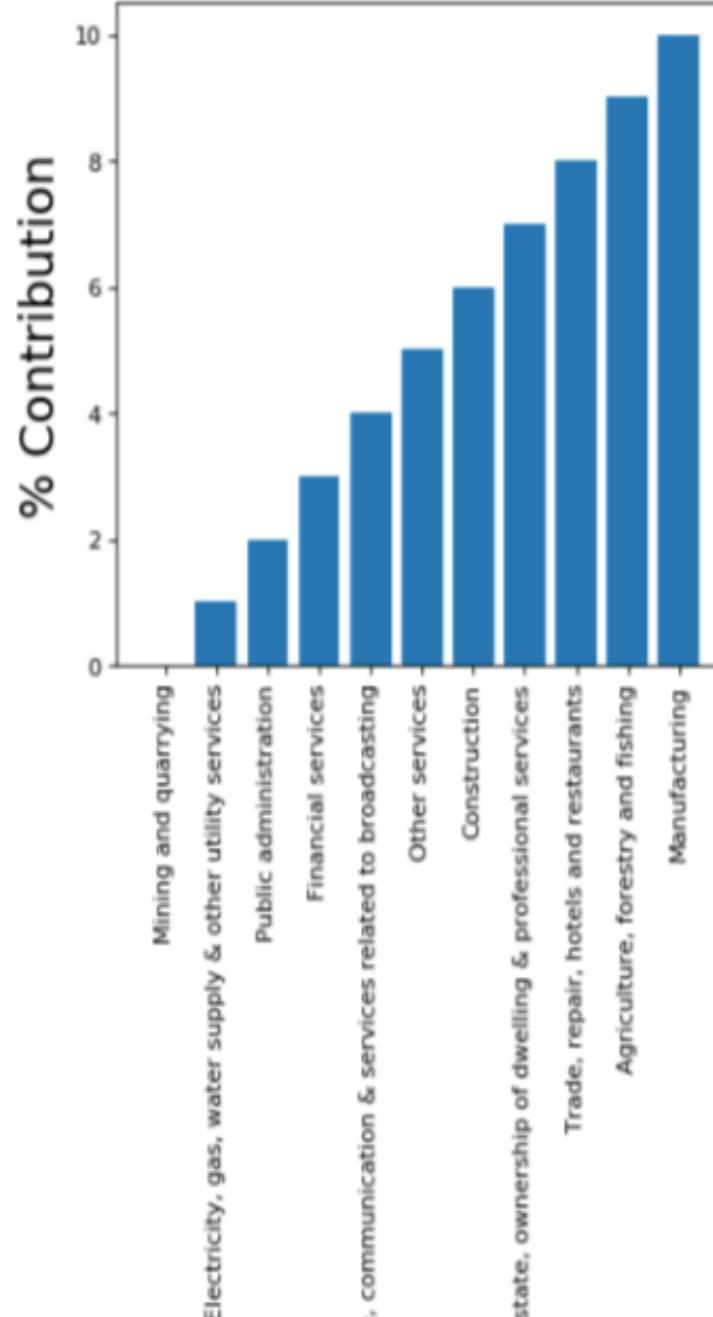
## Assignment: GDP Analysis

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)

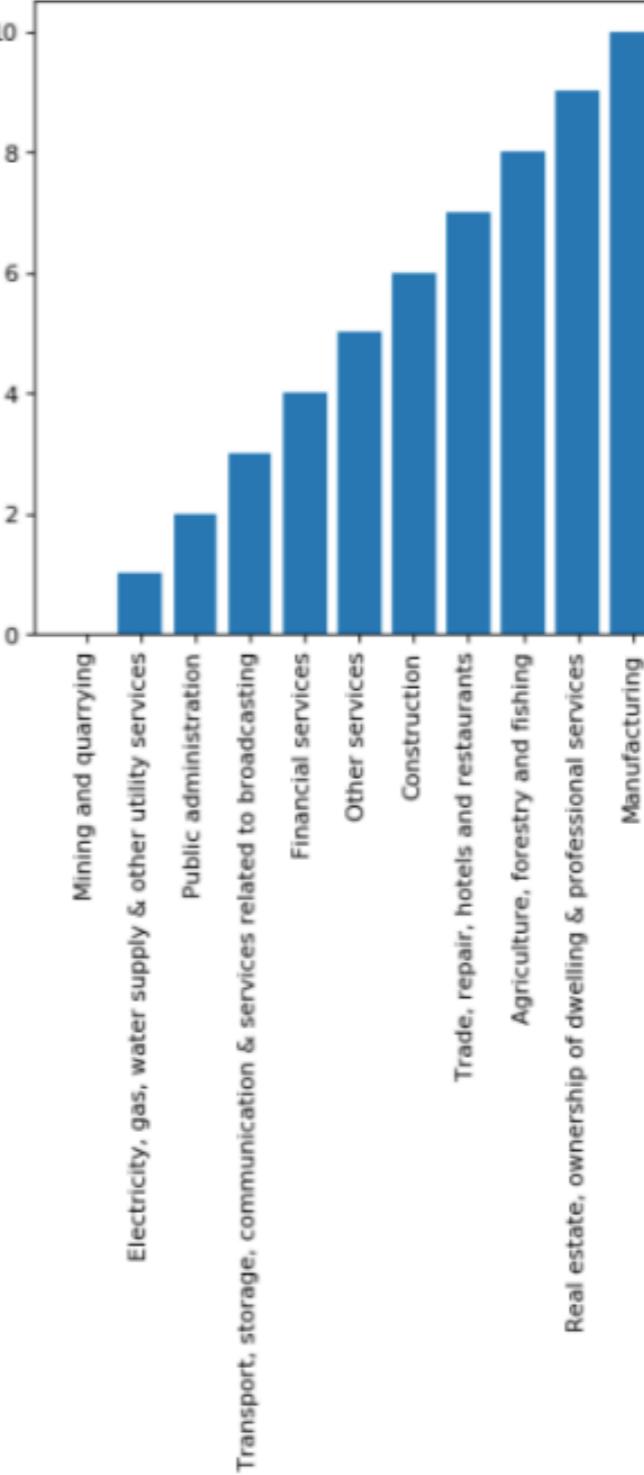
- For each category (C1, C2, C3, C4):
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  - Plot the contribution of the sub-sectors as a percentage of the GSDP of each category.

# Assignment: GDP Analysis

## % Contribution for C1

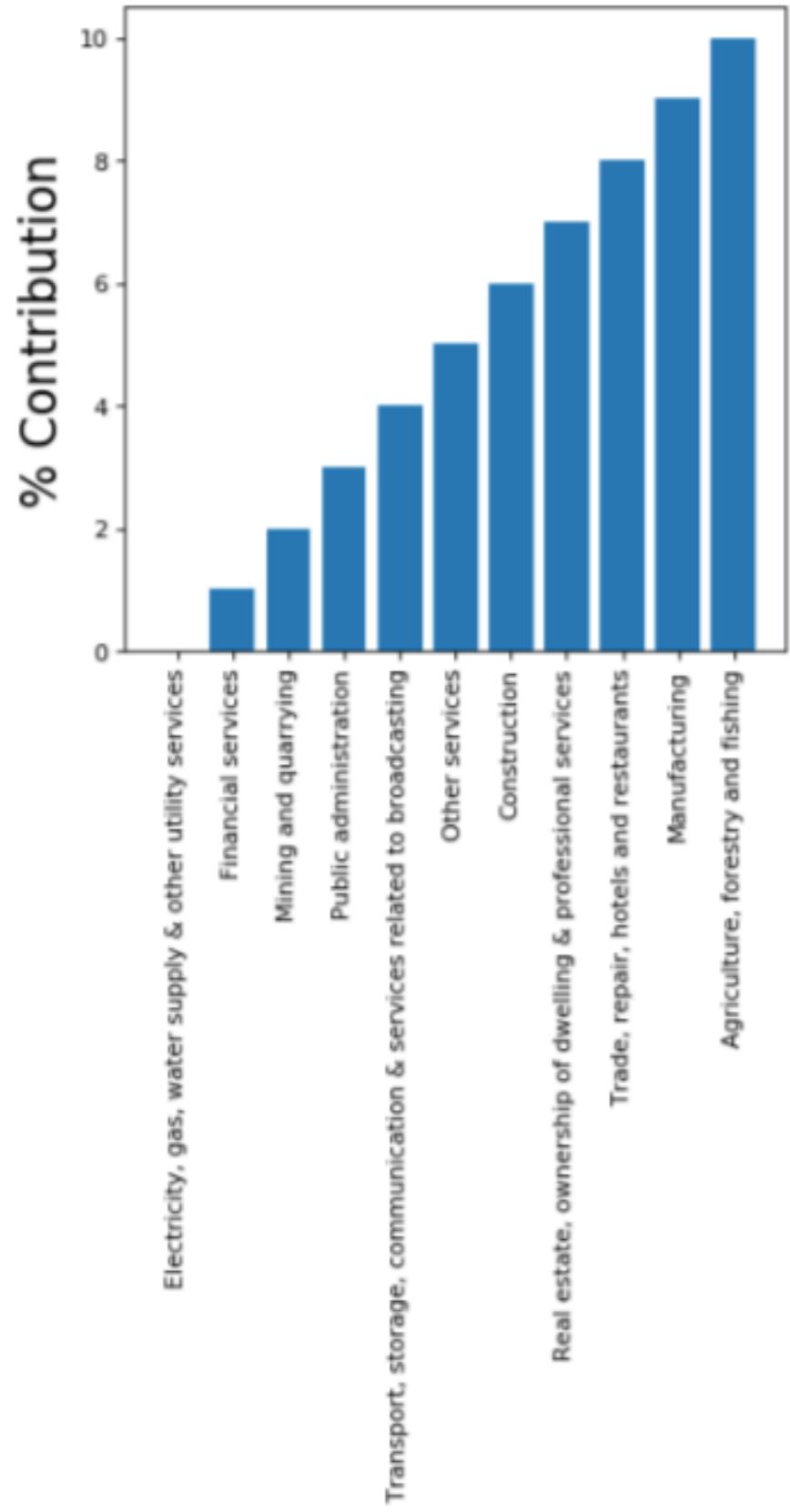


## % Contribution for C2

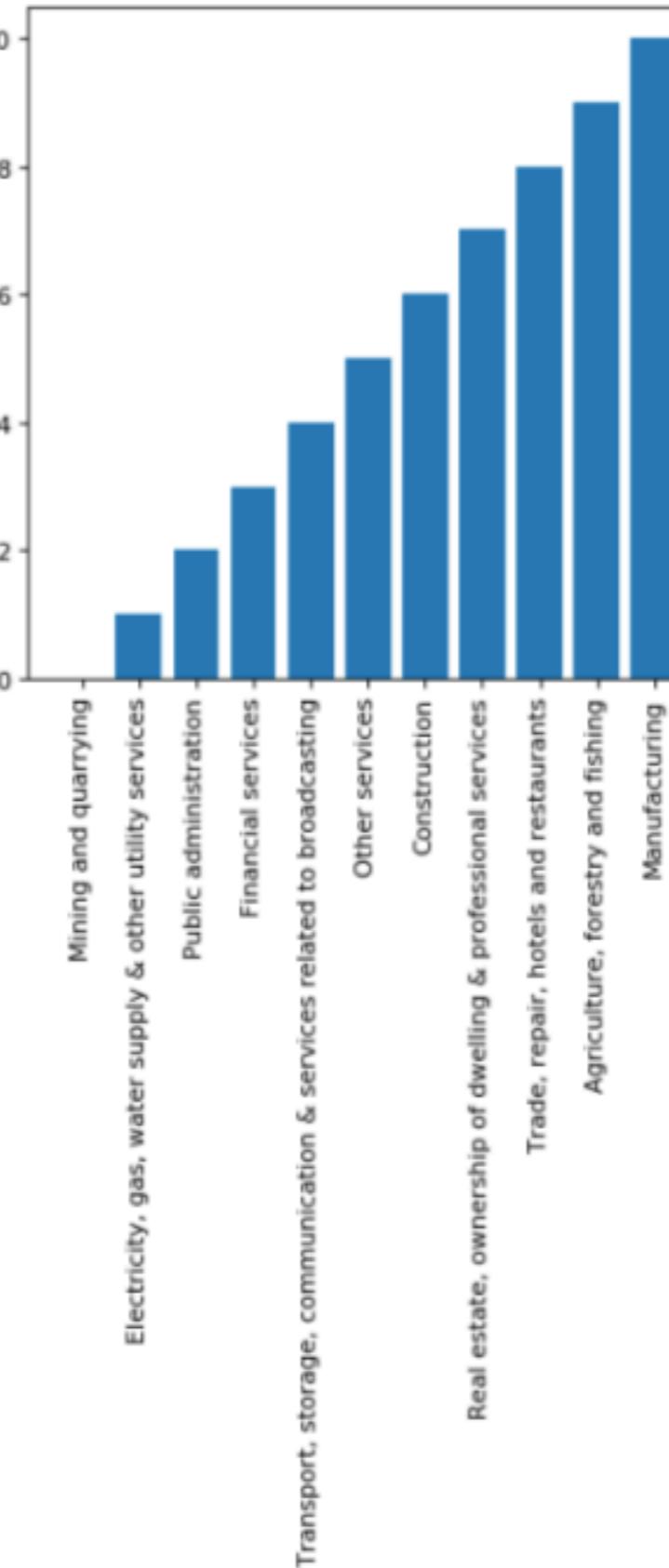


# Assignment: GDP Analysis

## % Contribution for C3



## % Contribution for C4



# Assignment: GDP Analysis

The top 3/4/5 sub-sectors that contribute to approximately 80% of the GSDP of each category are as follows: <br>

1. for C1: Mining and quarrying,

Electricity, gas, water supply & other utility services,  
Public administration,  
Transport, storage, communication & services related to broadcasting,  
Financial services,  
Other services,  
Construction,  
Real estate, ownership of dwelling & professional services,  
Trade, repair, hotels and restaurants .

2. for C2: Mining and quarrying,

Electricity, gas, water supply & other utility services,  
Public administration,  
Financial services,  
Transport, storage, communication & services related to broadcasting,  
Other services,  
Construction,  
Trade, repair, hotels and restaurant,  
Agriculture, forestry and fishing.

3. for C3:

Electricity, gas, water supply & other utility services,  
Financial services,  
Mining and quarrying,  
Public administration,  
Transport, storage, communication & services related to broadcasting,  
Other services,  
Construction,  
Real estate, ownership of dwelling & professional services,  
Trade, repair, hotels and restaurant.

4. for C4: Mining and quarrying

Electricity, gas, water supply & other utility services,  
Public administration,  
Financial services,  
Transport, storage, communication & services related to broadcasting,  
Other services,  
Construction,  
Real estate, ownership of dwelling & professional services,  
Trade, repair, hotels and restaurant.

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**The sub-sectors seem to be correlated with high GDP are:**

1. Manufacturing (Secondary sector)
2. Agriculture, forestry and fishing (Primary Sector)
3. Trade, repair, hotels and restaurants (Tertiary Sector)

**The sub-sectors that the various categories need to focus on are as follows:**

1. for C1: Mining and quarrying,  
Electricity, gas, water supply & other utility services,  
Public administration,  
Financial services,
2. for C2: Mining and quarrying,  
Electricity, gas, water supply & other utility services,  
Public administration,  
Transport, storage, communication & services related to broadcasting,
3. for C3: Electricity, gas, water supply & other utility services,  
Financial services,  
Mining and quarrying,  
Public administration,
4. for C4: Mining and quarrying  
Electricity, gas, water supply & other utility services,  
Public administration,  
Financial services

# Assignment: GDP Analysis

**The top 3/4/5 sub-sectors that contribute to approximately 80% of the GSDP of each category are as follows:**

1. for C1: Mining and quarrying,  
Electricity, gas, water supply & other utility services,  
Public administration,  
Transport, storage, communication & services related to broadcasting,  
Financial services,  
Other services,  
Construction,  
Real estate, ownership of dwelling & professional services,  
Trade, repair, hotels and restaurants .
  
2. for C2: Mining and quarrying,  
Electricity, gas, water supply & other utility services,  
Public administration,  
Financial services,  
Transport, storage, communication & services related to broadcasting,  
Other services,  
Construction,  
Trade, repair, hotels and restaurant,  
Agriculture, forestry and fishing.
  
3. for C3:  
Electricity, gas, water supply & other utility services,  
Financial services,  
Mining and quarrying,  
Public administration,  
Transport, storage, communication & services related to broadcasting,  
Other services,  
Construction,  
Real estate, ownership of dwelling & professional services,  
Trade, repair, hotels and restaurant.
  
4. for C4: Mining and quarrying  
Electricity, gas, water supply & other utility services,  
Public administration,  
Financial services,  
Transport, storage, communication & services related to broadcasting,  
Other services,  
Construction,  
Real estate, ownership of dwelling & professional services,  
Trade, repair, hotels and restaurant.

# Assignment: GDP Analysis

**PART-II**

## Part-II: GDP and Education Dropout Rates

In this part of the analysis, you will investigate whether there is any relationship between per capita GDP with dropout rates in education.

### Data

**Data II:** This section will require the dropout rate dataset apart from the dataset that I used in Part-1b.

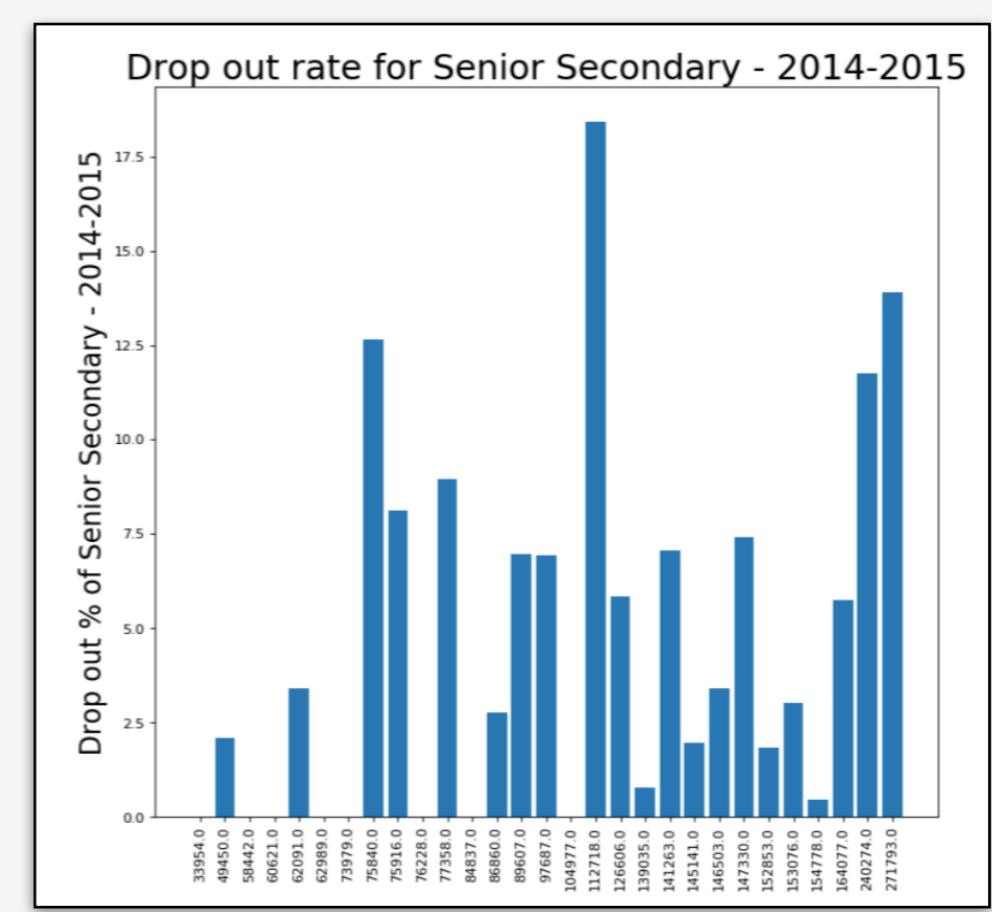
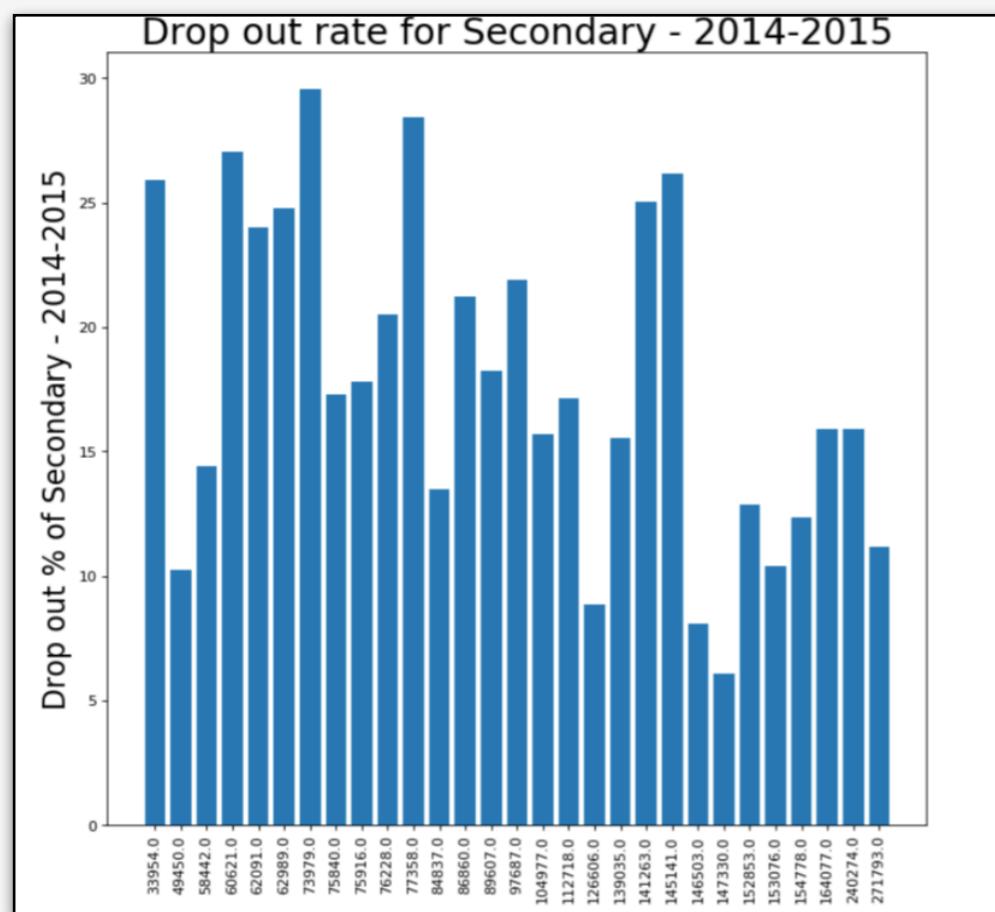
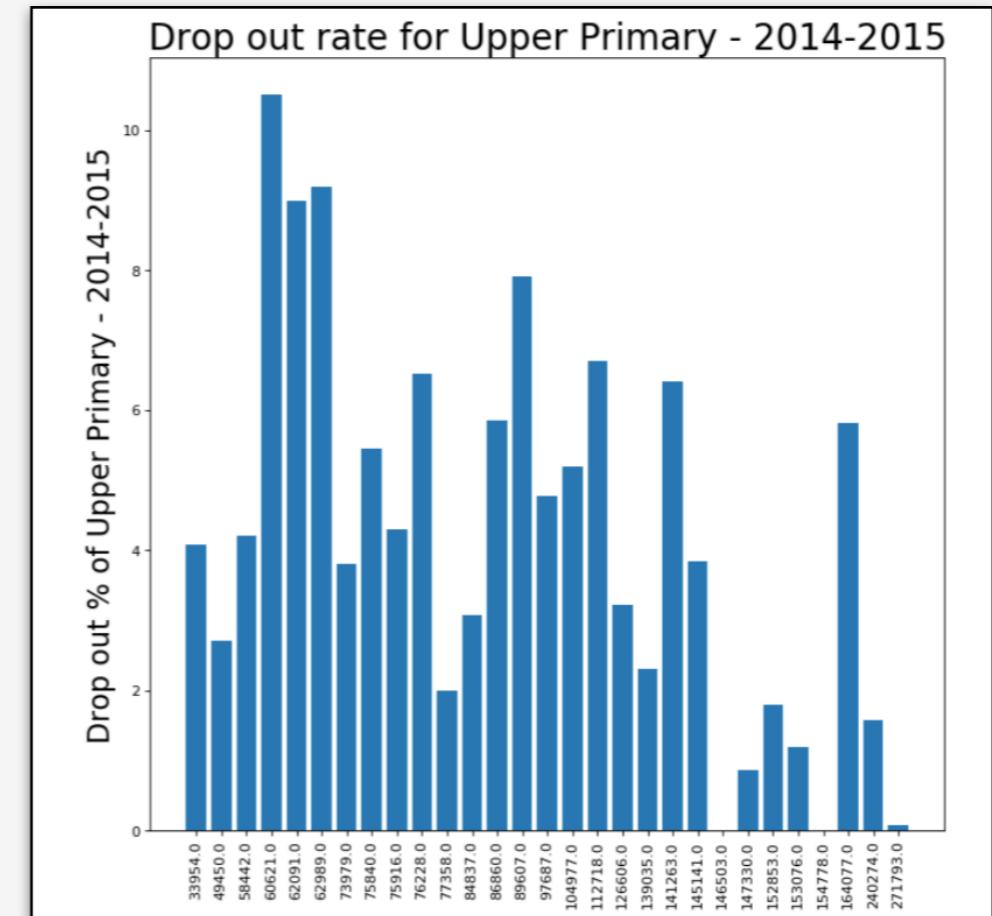
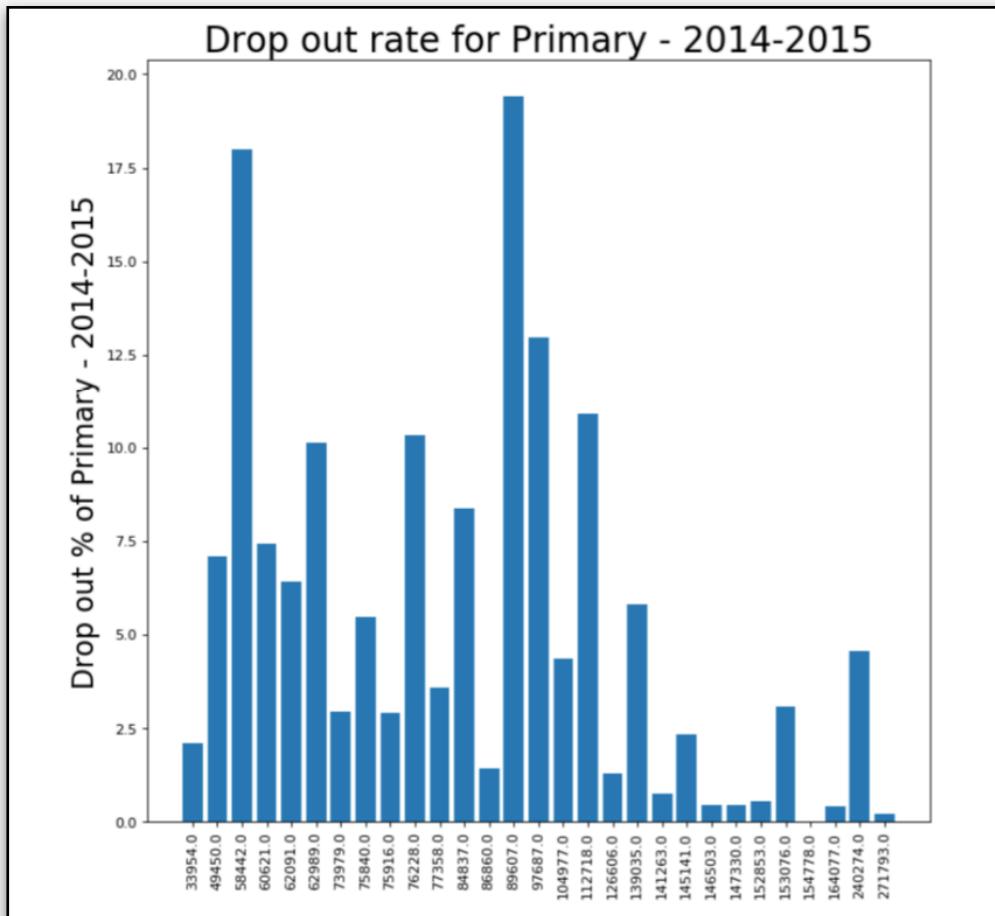
### Part-II: GDP and Education analysis.

- Analyse if there is any correlation of GDP per capita with dropout rates in education (primary, upper primary and secondary) for the year 2014-2015 for each state. Choose an appropriate plot to conduct this analysis.
  
- Write down the key insights you draw from this data:
  - Form at least one reasonable hypothesis for the observations from the data.

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**Visualisations**

# Assignment: GDP Analysis



## Analysis

### **Hypothesis : As the drop out % of any level of education increases, the per capita GDP Decreases**

After I did the plots of per capita GDP with each level of education we see that:

For Primary - 2014-2015, Secondary - 2014-2015, Upper Primary - 2014-2015 : My Hypothesis is correct because we see that the states that have low GDP have high drop out rates.

whereas

For Senior Secondary 2014-2015: its the opposite. : my hypothesis fails here  
here states which have higher GDP have High Drop out rates.

The reason behind this according to my understanding is:

Students of higher education drop out of college more because they have other fields to pursue and are better at them in turn increasing the GDP of the State.

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**Thank You**