GDP Assignment

IIITB Data Science Course I, Module 6

By: Hari Thapliyal

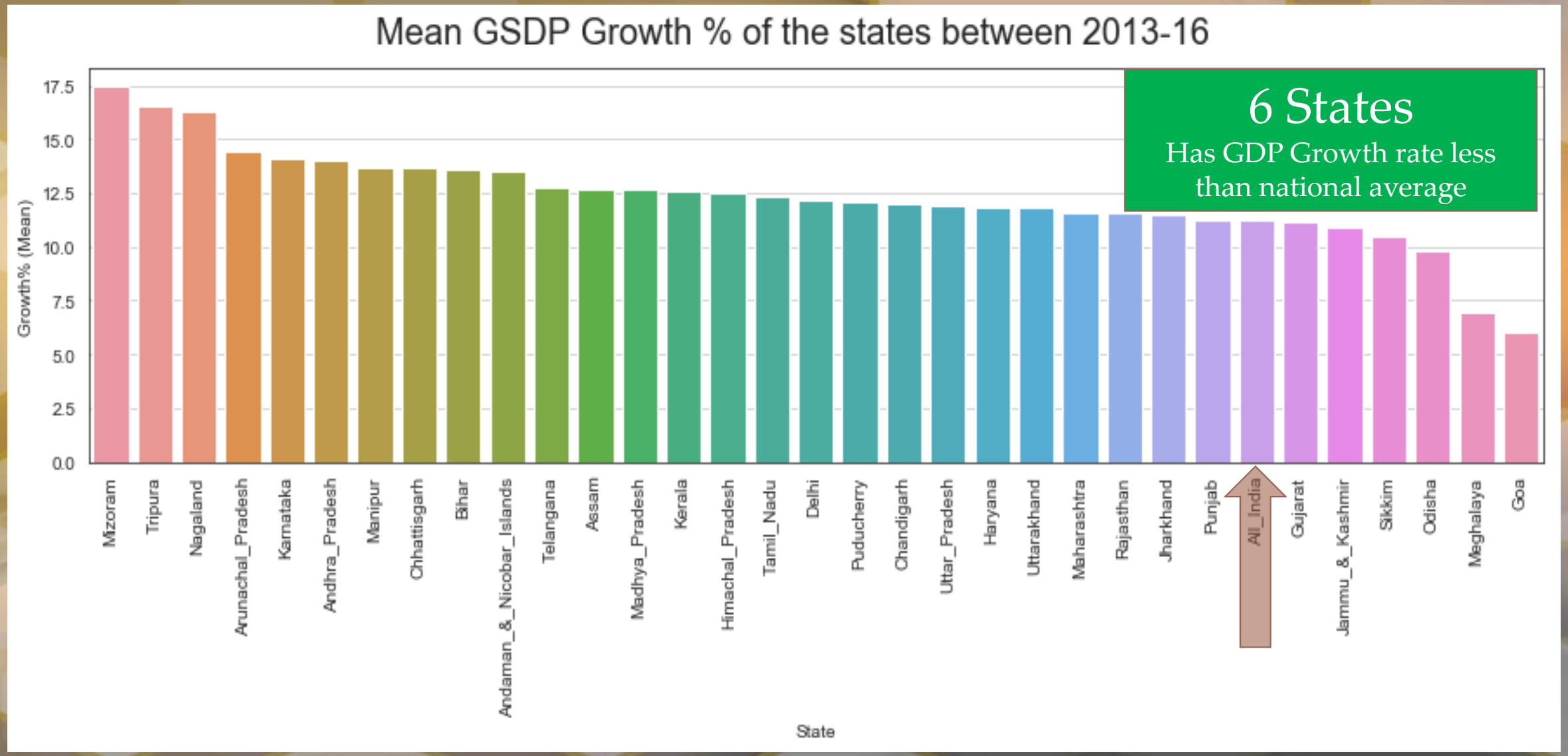
Part IA: GDP Analysis of Indian States

Task 1

- *Remove the rows: '(% Growth over the previous year)' and 'GSDP - CURRENT PRICES*

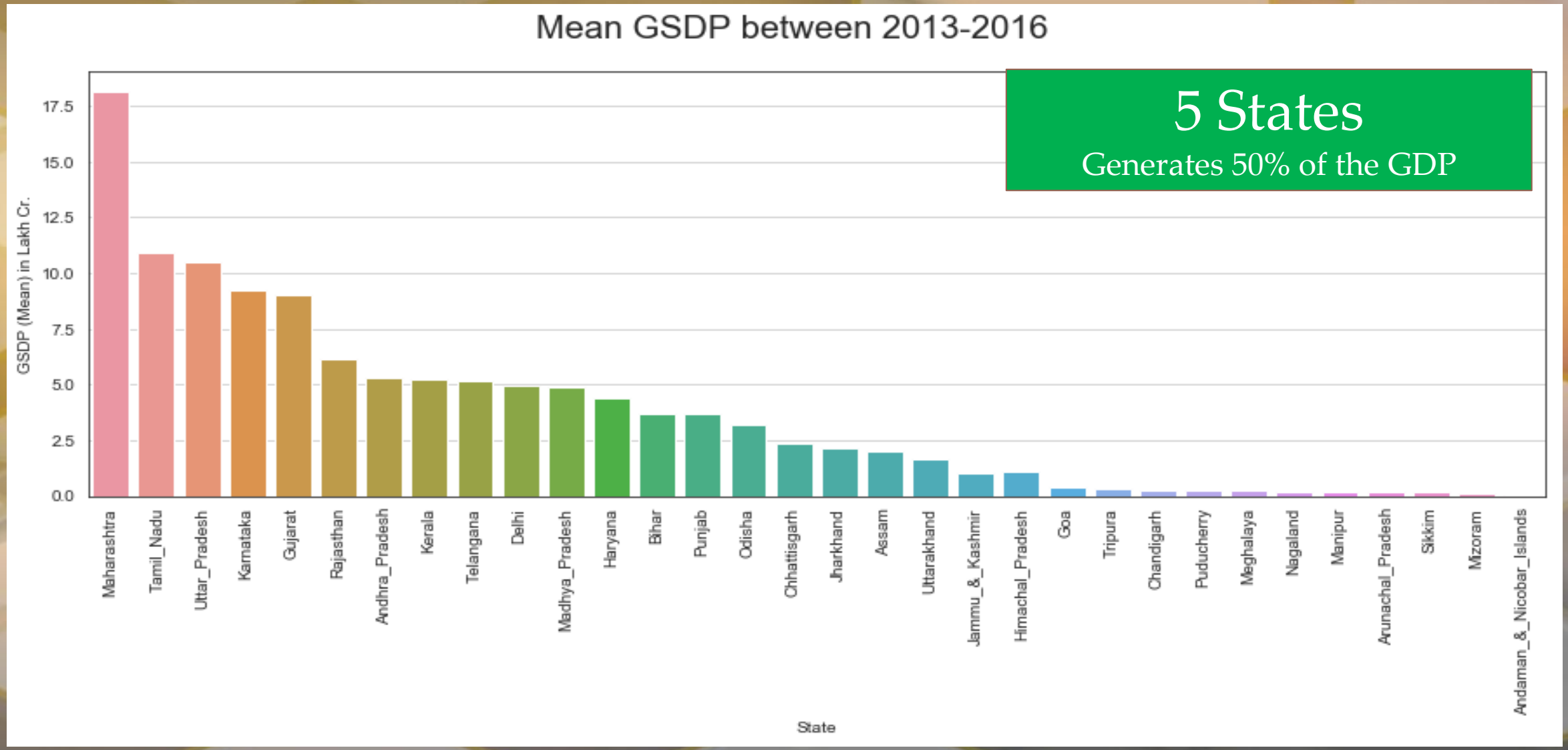
Task 2

Calculate the average growth of states over the duration 2013-14, 2014-15 and 2015-16



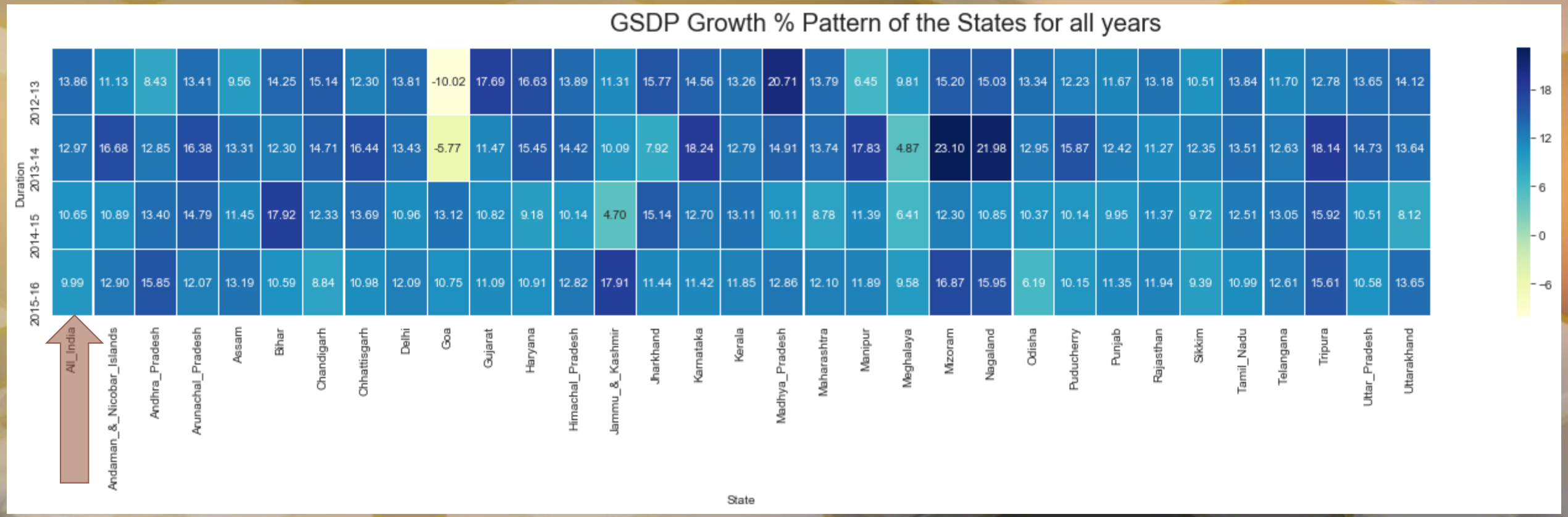
Extra

Mean GSDP of the states between 2013-16



Task 3

States have been growing consistently fast, and have been struggling on GDP?



Task 3

States have been growing consistently fast, and have been struggling on GDP?

Growing	Maintaining	Ups & Downs	Declining
1. Andhra	1. Delhi	1. Andman & Nico	1. Chandigarh
2. Goa (except 15-16)	2. Puddu (except 13-14)	2. Assam	2. Chattisgarh
3. Manipur (except 13-14)	3. Rajasthan (except 12-13)	3. Bihar	3. Gujarat
4. Meghalaya (except 12 13)	4. Tripura (except 13-14)	4. Himchal Pradesh	4. Haryana
5. Telangana (except 15-16)	5. Up (except 13-14)	5. Jammu & Kashmir	5. Karnataka
	6. Uttrakhand (except 14-15)	6. Jharkhand	6. Odisa
	7. Up down	7. Kerala	7. Sikkim (expcept 13-14)
		8. Madhya Pradesh	8. Tamil Nadu
		9. Maharastra	**9. All India**
		10. Naga	
		11. Punjab	

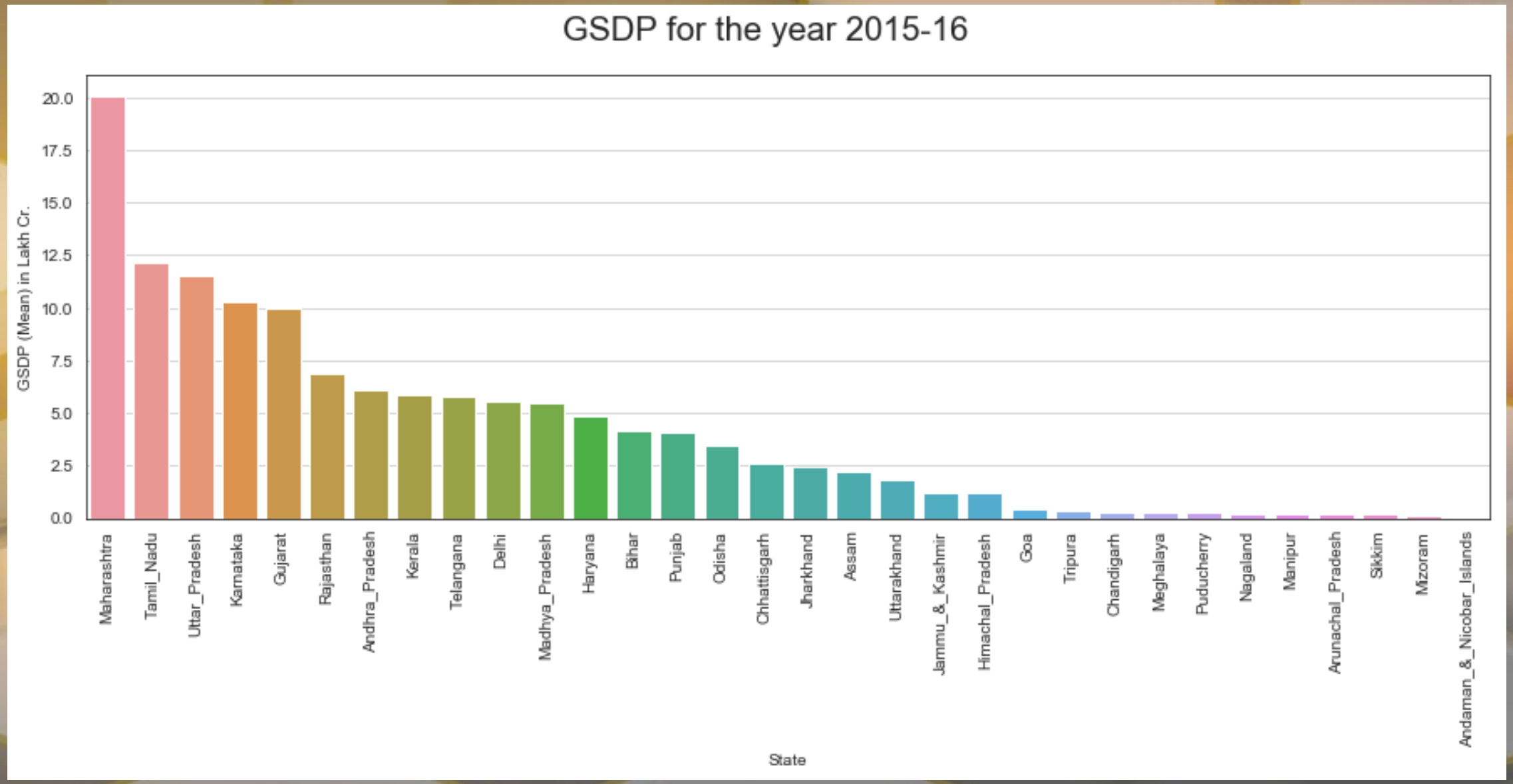
Task 4

Curiosity exercise

- *My home state is Uttrakhand*
- *What has been the average growth rate of your home state : 11.80*
- *How does it compare to the national average over this duration?*
  - *All India average growth is 11.20. My state is marginally better than national average*

Task 5

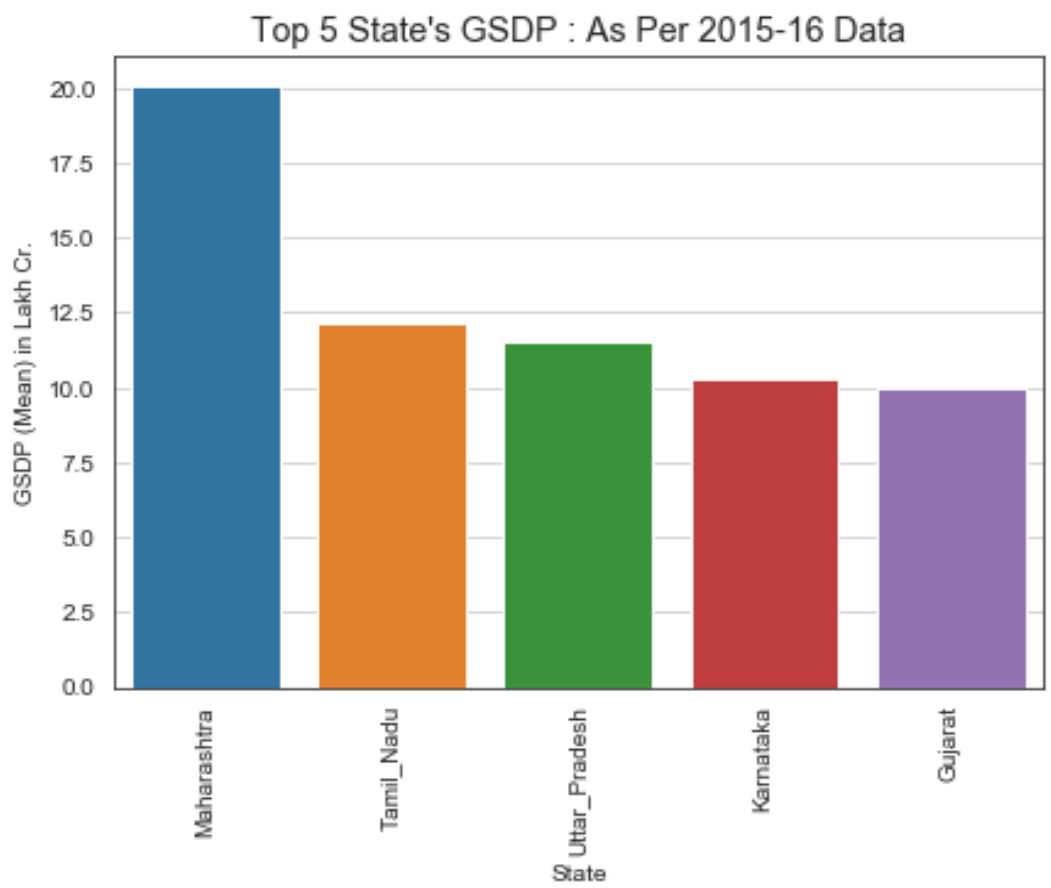
Plot the total GDP of the states for the year 2015-16

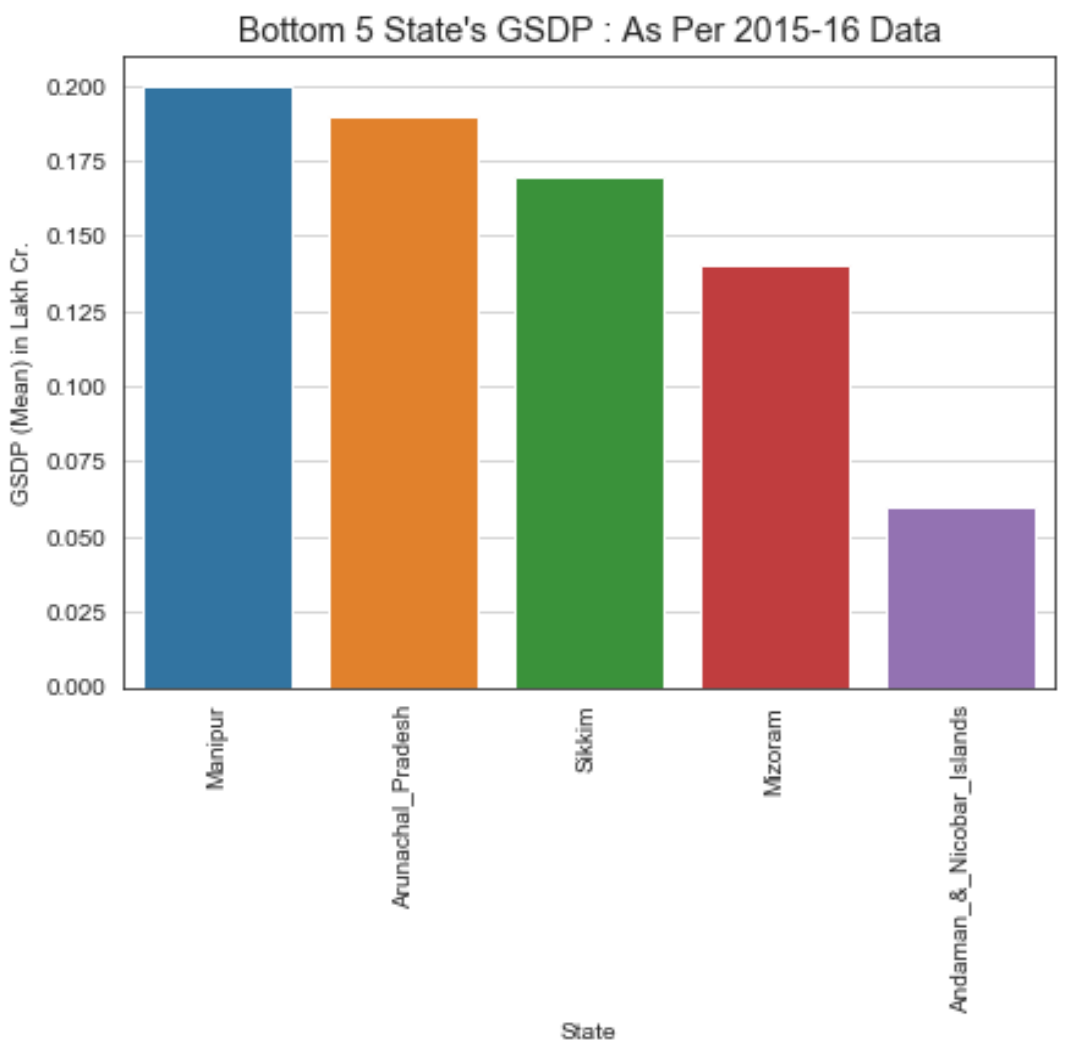


Task 6

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

All bottom 5 states are very small states. Except A&N Island all the NE States





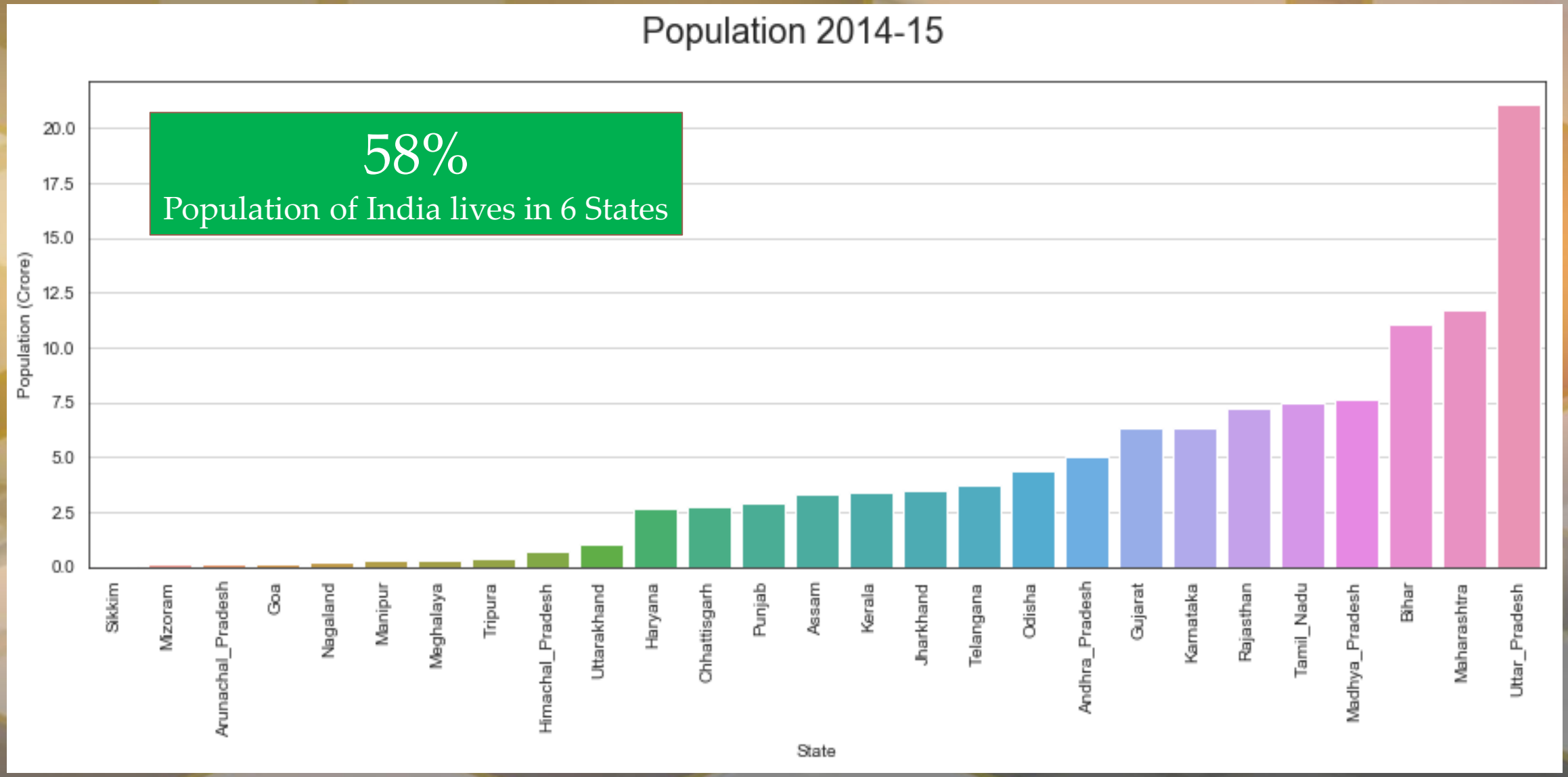
Part IB: GDP Analysis of Indian States

Guidelines from IIITB

- ***Task1: Perform the analysis only for the duration : 2014-15.***
- ***Task2: Filter out the Union Territories (Delhi, Chandigarh, Andaman and Nicobar Islands etc.) for further analysis since they are governed directly by the centre, not state governments.***

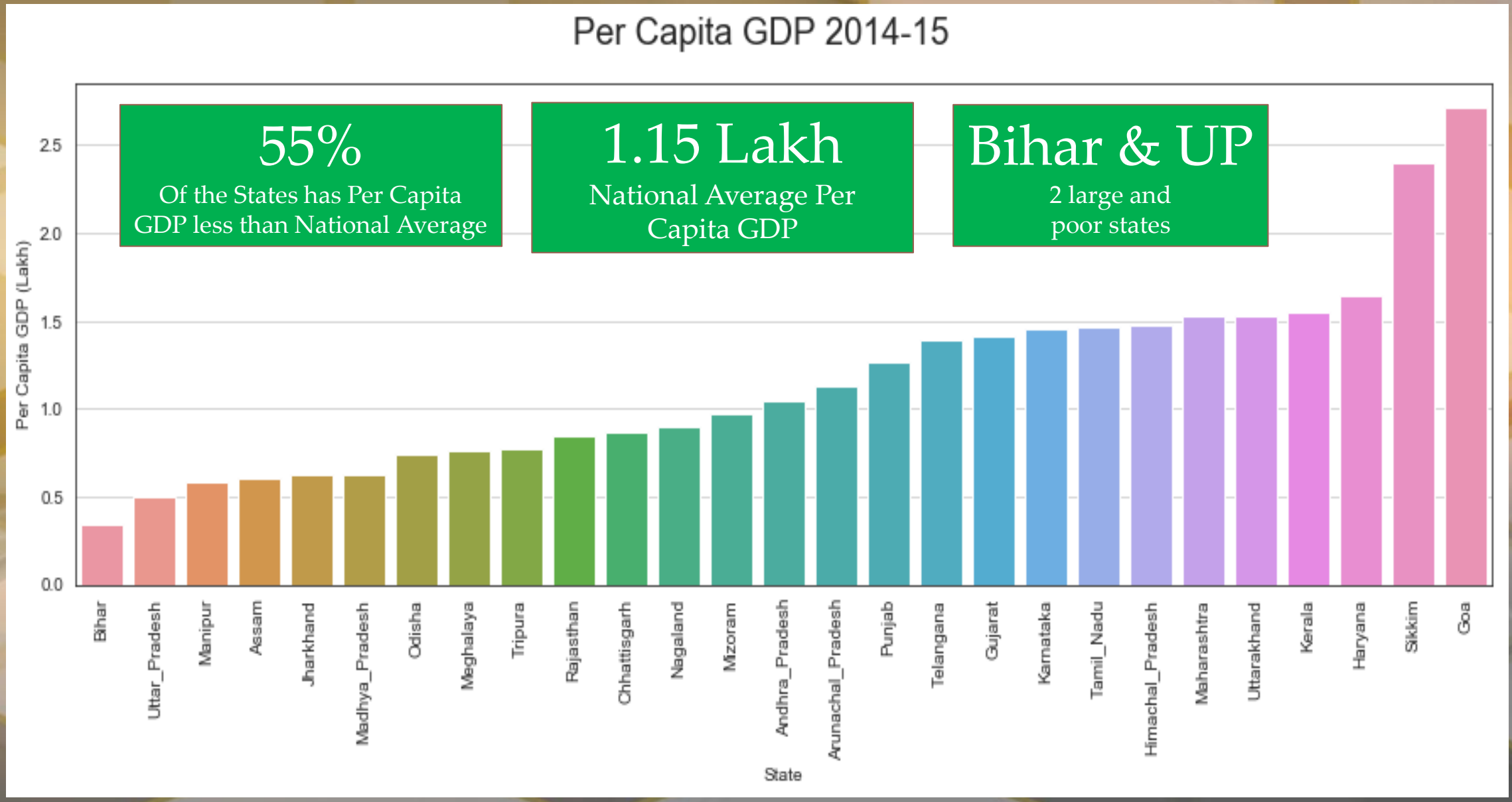
Insight

Population



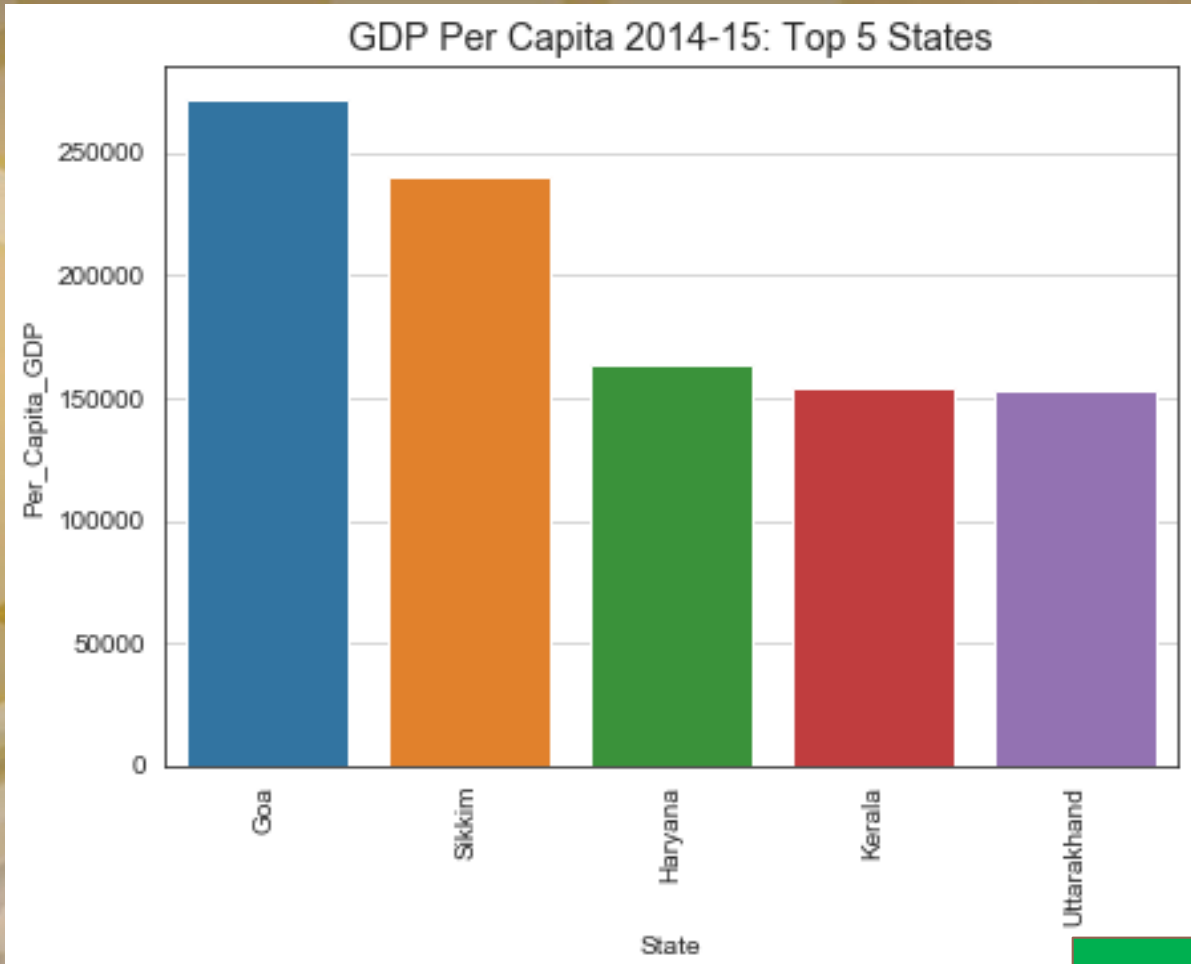
Task 3

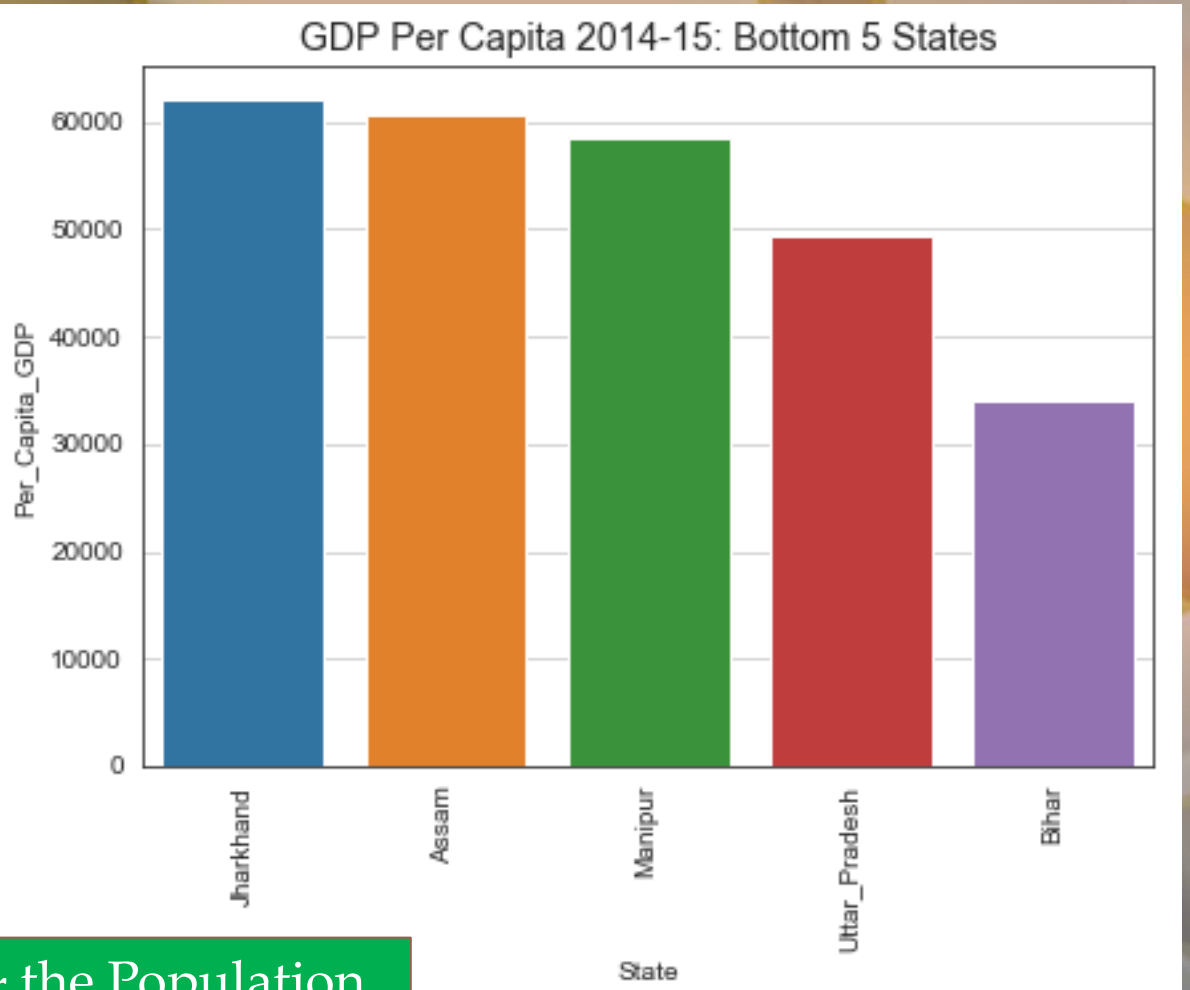
Plot the GDP per capita for all the states



Task 4

Top-5 and Bottom-5 States based on GDP per capita.





Lessor the Population
Higher the Per Capita GDP

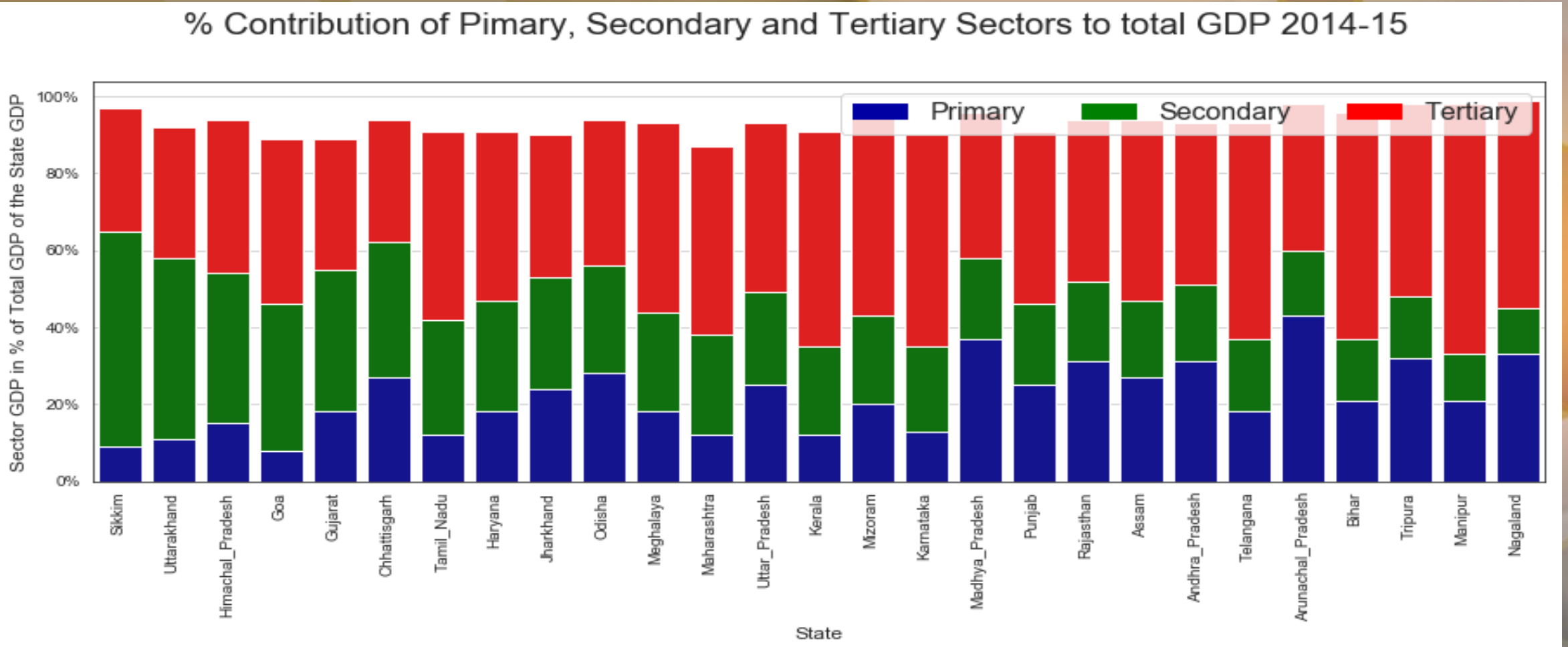
Task 5

Highest per capita GDP to the Lowest per capita GDP Ratio

- Max Per Capita Income is 271793.0 (Goa)
- Min Per Capita Income is 33954.0 (Bihar)
- Ratio of Max/Min Per Capita Income is 8.0

Task 6

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



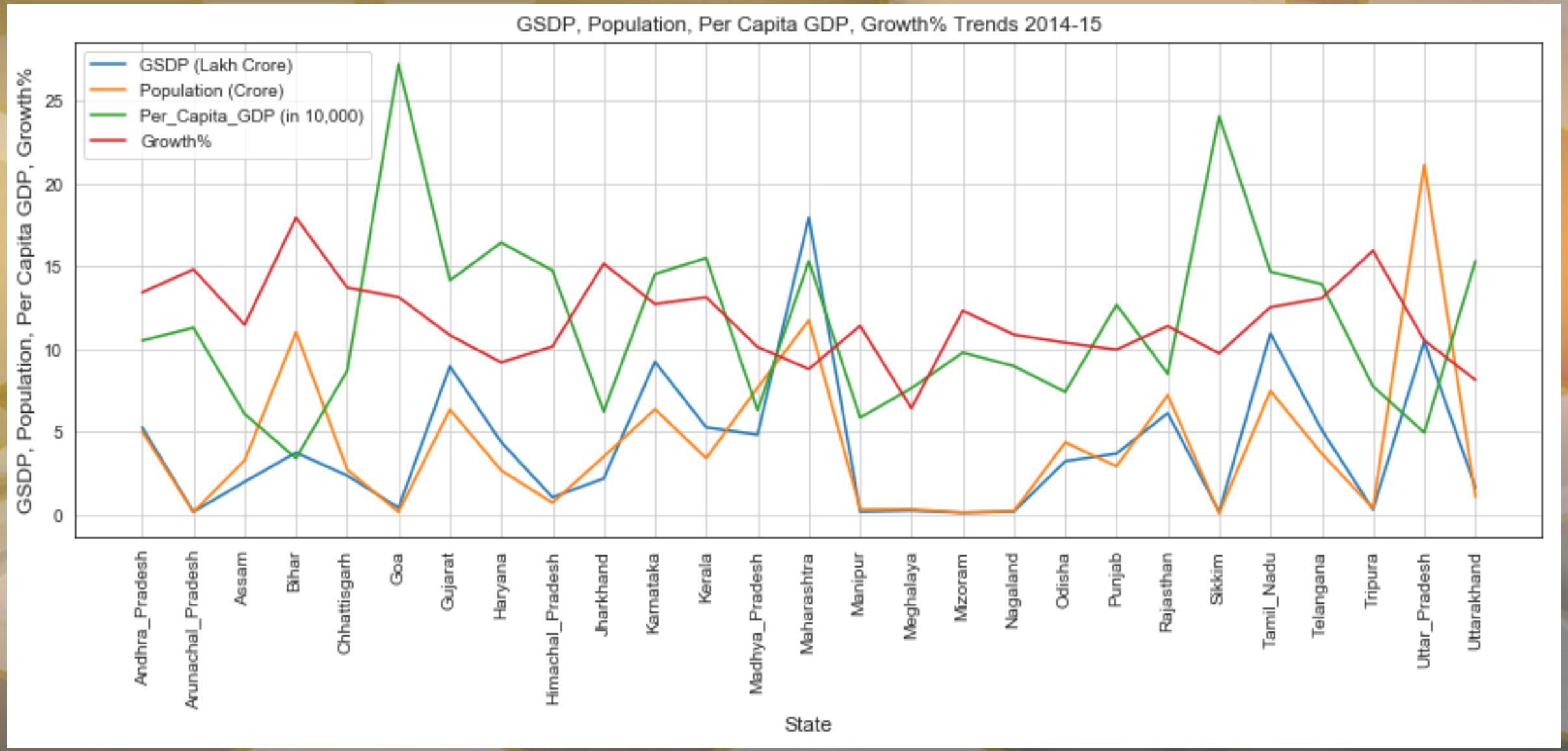
Top 5
Primary Industry States
Arunanachal, MP, Nagaland, Tripura, Rajasthan

Top 5
Secondary Industry States
Sikkim, Uttrakhand, HP, Goa, Gujarat

Top 5
Tertiary Industry States
Manipur, Bihar, Telangana, Kerala, Karnataka

Extra

One metrics is not enough to measure the business success of a state



Task 7

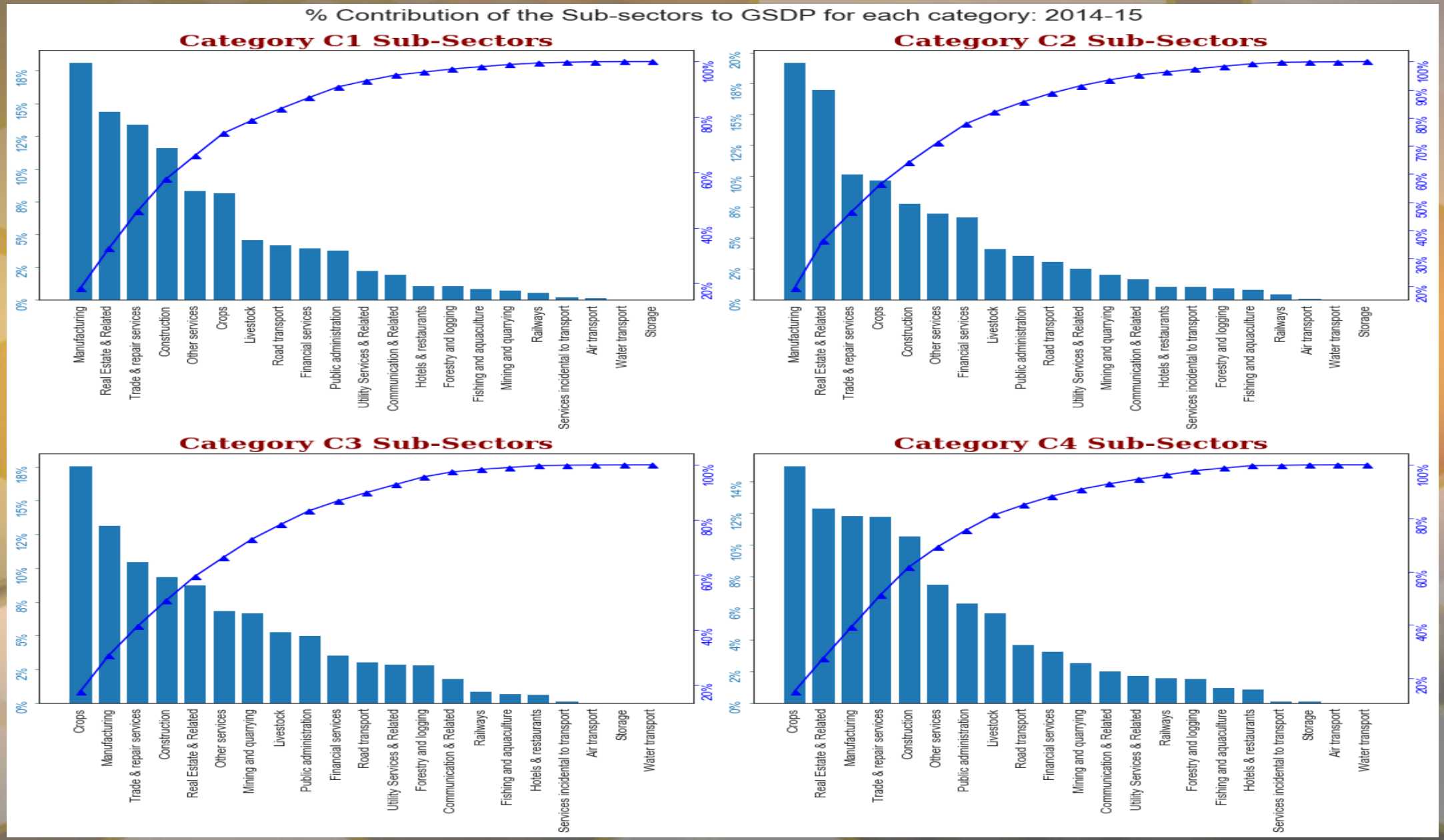
Categorize the states into four categories based on GDP per capita

C1, C2, C3, C4 - C1 would have the highest per capita GDP, C4 the lowest. The quantile values are 0.20,0.5, 0.85, 1.

- These subcategories of the states created based on the above given Percentile range of the Per Capita GDP as of 2014-15
- C1 Category States: Uttarakhand, Kerala, Haryana, Sikkim, Goa
- C2 Category States: Andhra_Pradesh, Arunachal_Pradesh, Punjab, Telangana, Gujarat, Karnataka, Tamil_Nadu, Himachal_Pradesh, Maharashtra
- C3 Category States: Madhya_Pradesh, Odisha, Meghalaya, Tripura, Rajasthan, Chhattisgarh, Nagaland, Mizoram
- C4 Category States: Bihar, Uttar_Pradesh, Manipur, Assam, Jharkhand

Task 9

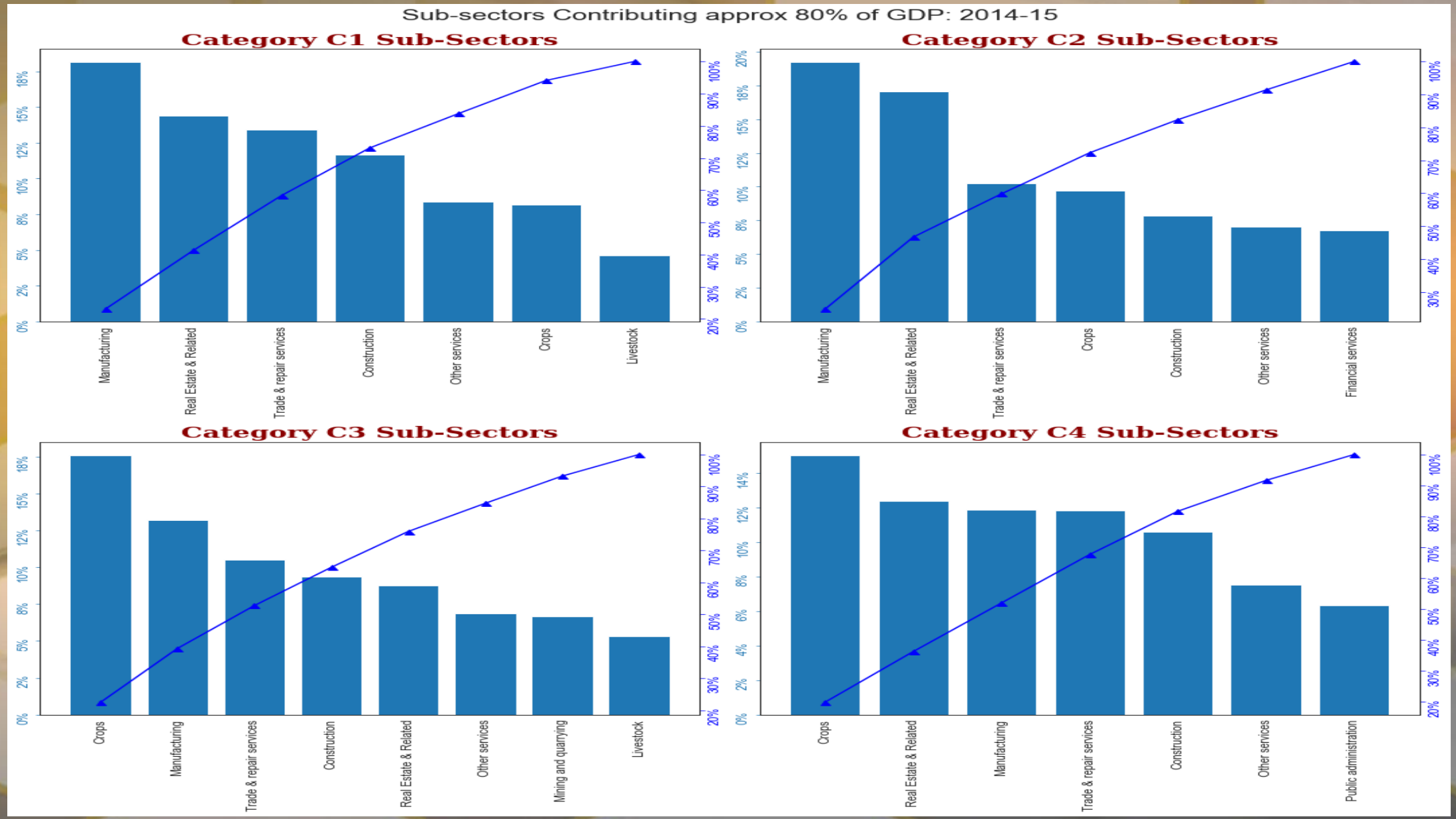
Contribution of all the sub-sectors as a percentage of the GSDP of each category



Task 8

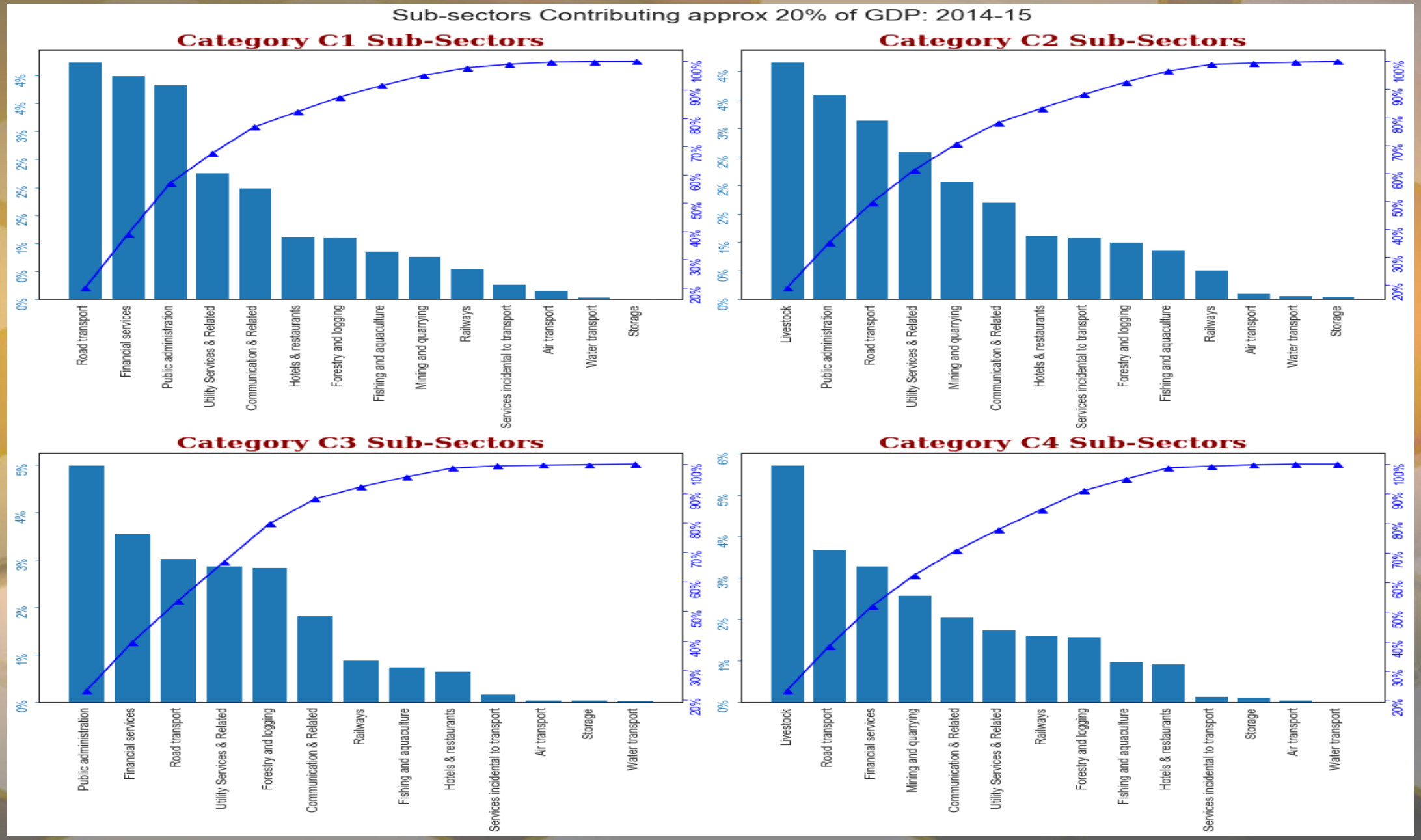
Most income for C1 & C2 from Secondary & Tertiary Sector And C3 & C4 from Primary Sector

Top sub-sectors contributing approx. 80% of the GSDP of each category



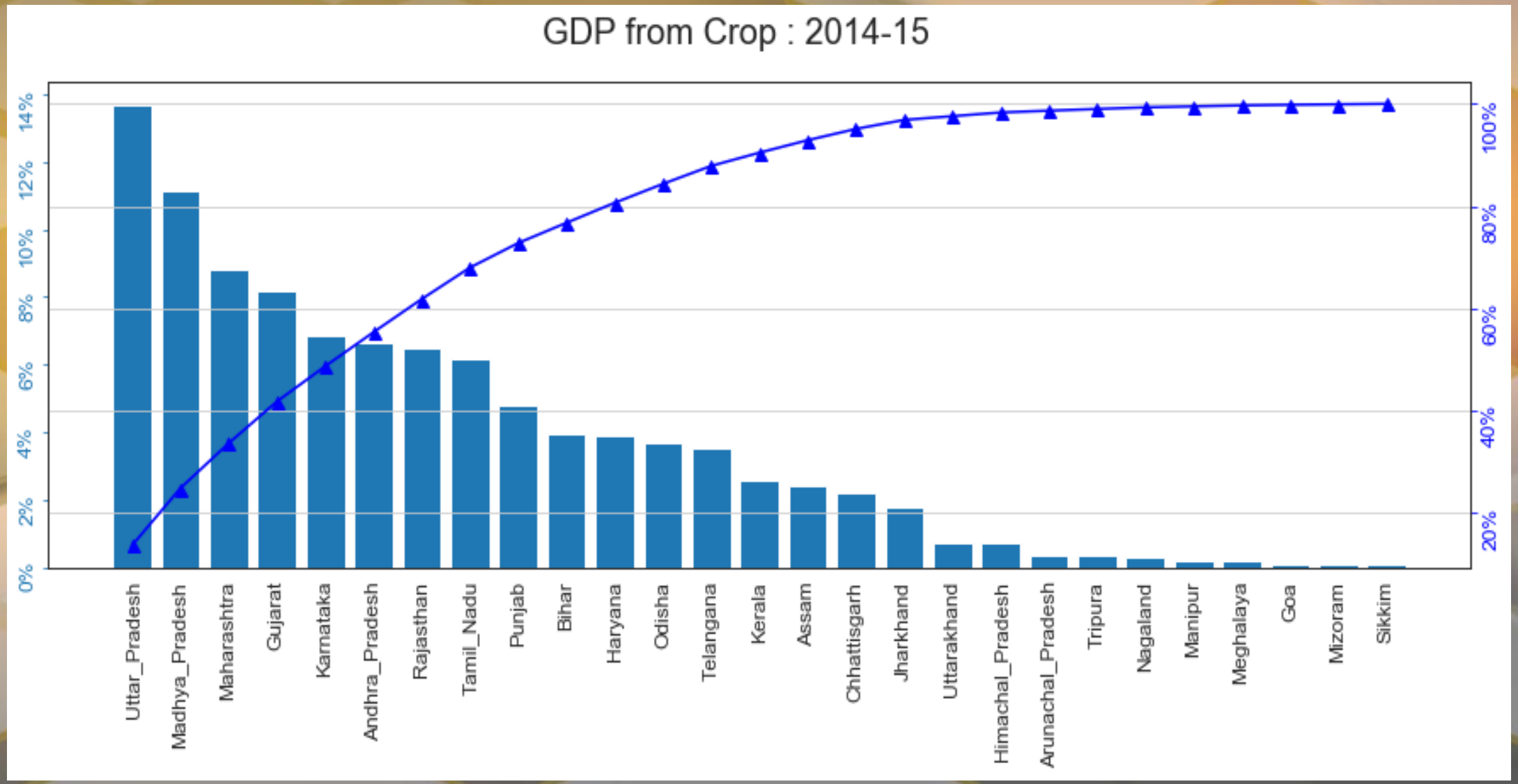
Insight

Industries Contributing **20%** of GDP



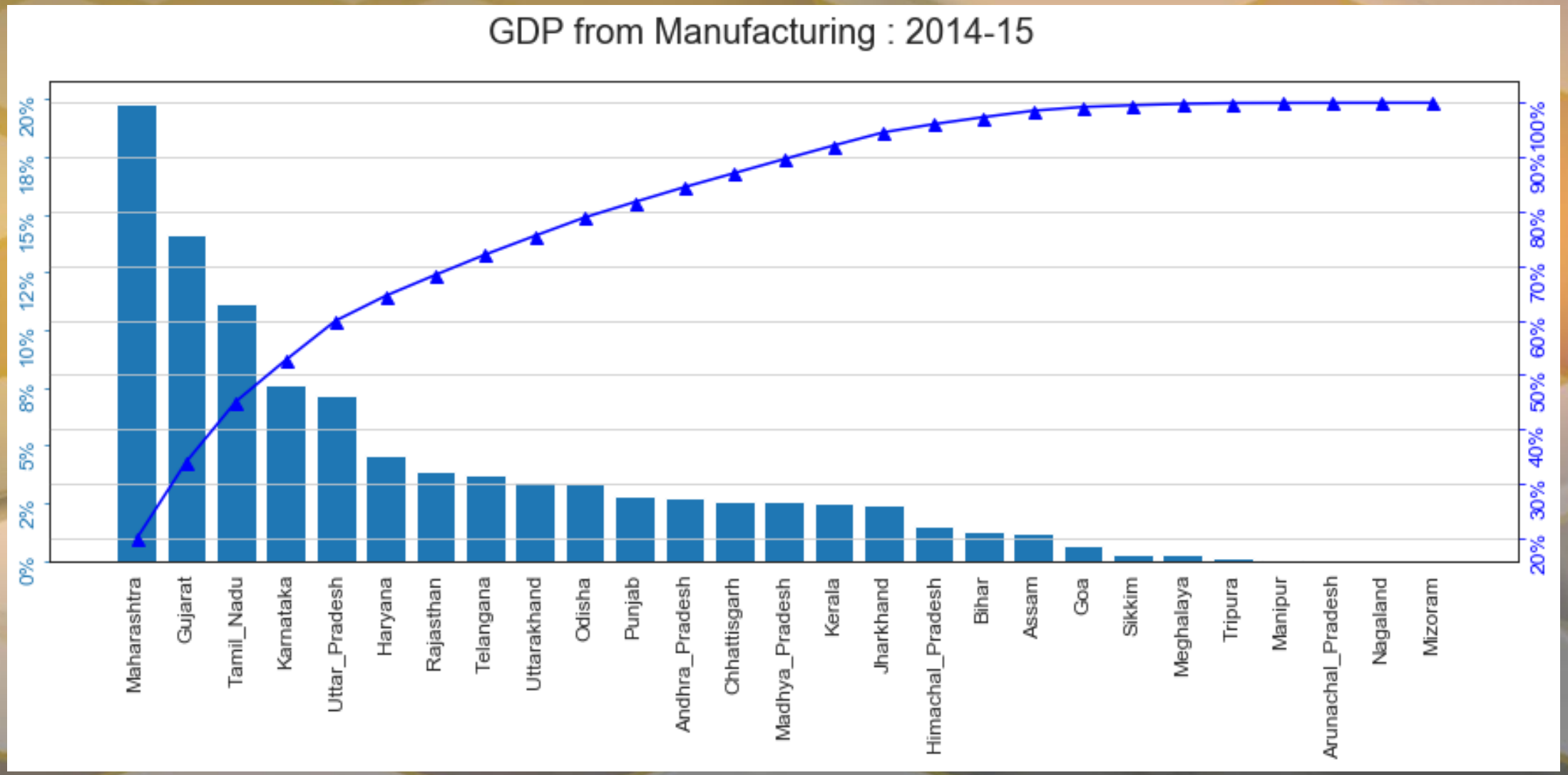
Insight

60% (approx.) Crop GDP from 4 States



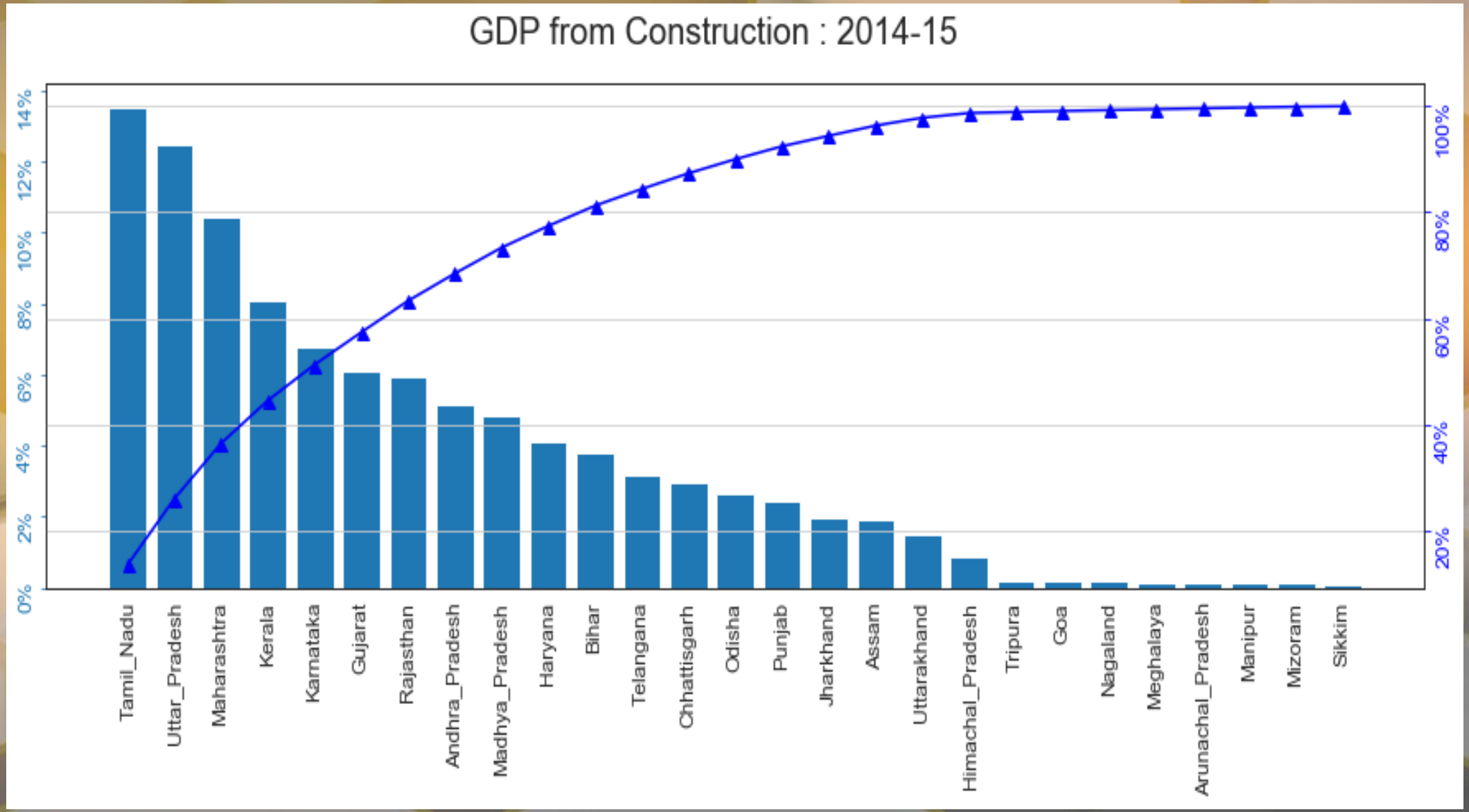
Insight

60% Manufacturing GDP from 5 States



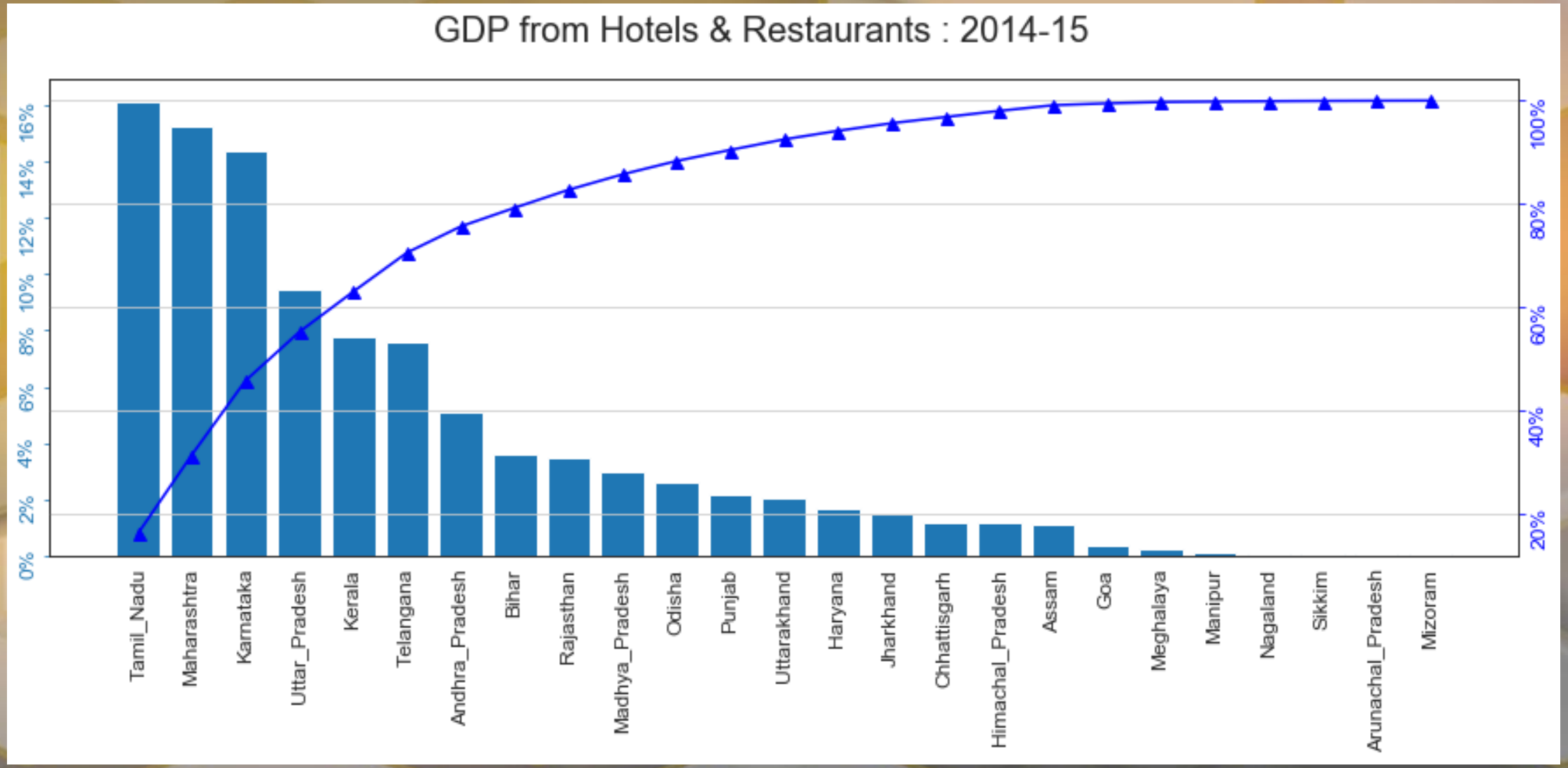
Insight

60% (approx.) Construction GDP from 6 States



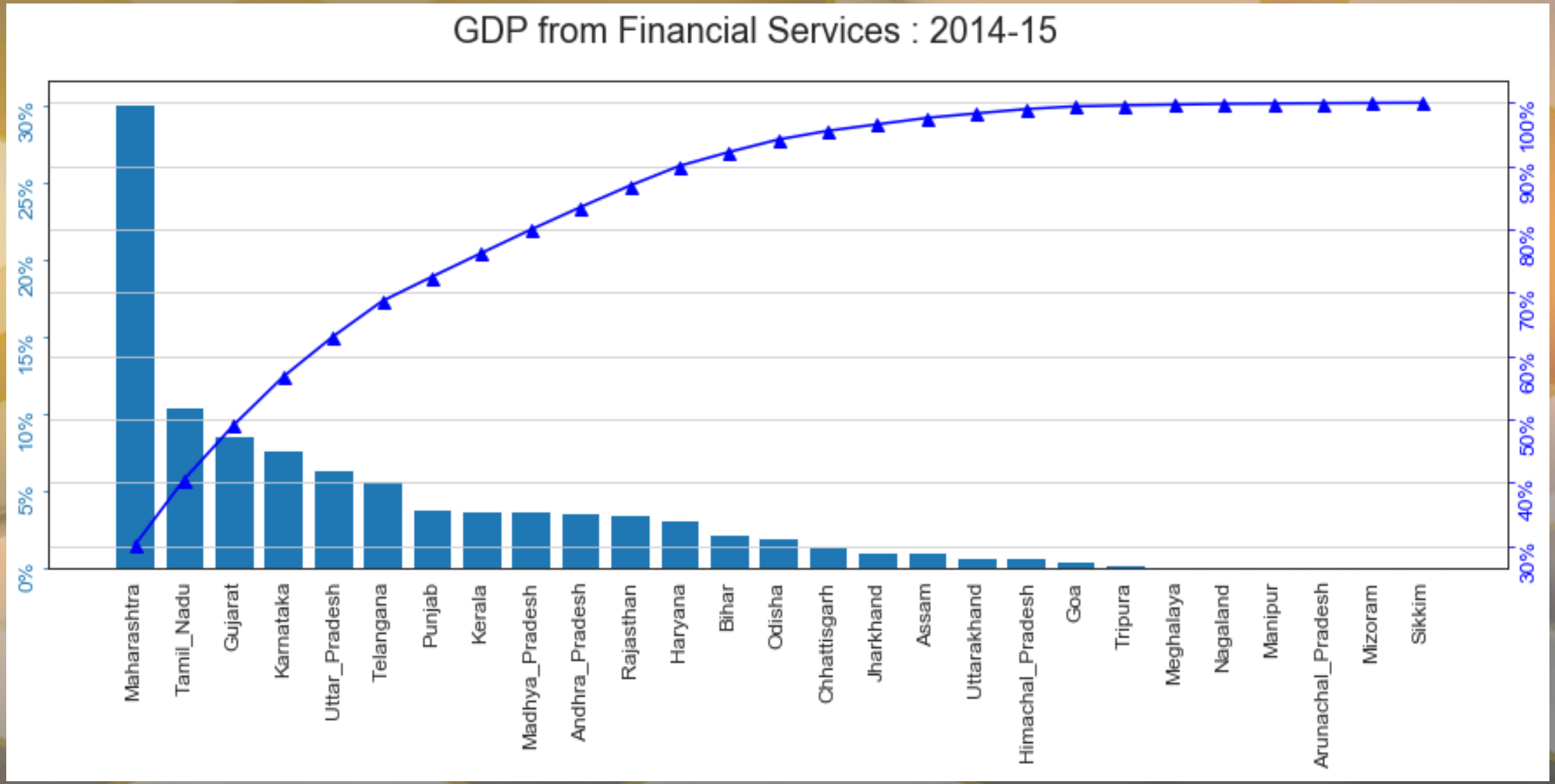
Insight

60% Hotel & Restaurant GDP from 4 States



Insight

40% Financial Services GDP from 2 States



Task 10

Observe non-obvious insights from Previous Analysis

Crops	Manufacturing	Construction
• Utter Pradesh • Madhya Pradesh • Maharastra • Gurjarat	• Maharastra • Gujarat • Tamil Nadu • Karnataka • Utter Pradesh	• Tamil Nadu • Utter Pradesh • Maharastra • Kerala

Hotel & Restaurants	Financial Services
• Tamil Nadu • Maharastra • Karnataka • Utter Pradesh	• Maharastra • Tamil Nadu • Gujarat • Karnataka

Task 2

Write the key insights you observe from this data

- **6 States** which has GDP growth rate less than national average
  - Gujarat, J & K, Sikkim, Odisha, Meghalaya, Goa
  - But Gujrat and Goa has high Per Capita GDP.
- **5 States** Generate 50% of the Total National GDP
  - MH, TN, UP, KN, Gujarat
- All bottom 5 states are very small states. Except A&N Island all the NE States
- **58% Population** of India lives in 6 States
  - UP, MH, Bihar, MP, TN, Rajasthan
- **Average National GDP** is 1.15 Lakh Crore. 55% of the states has Per Capita less than national average
- Bihar & UP 2 **large and poor states**
- Generally Lessor the Population **Higher** the Per Capita GDP of States

Task 2

Write the key insights you observe from this data

- Top 5 : Primary Industry States
  - Arunanchal, MP, Nagaland, Tripura, Rajasthan
- Top 5 : Secondary Industry States
  - Sikkim, Uttrakhand, HP, Goa, Gujarat
- Top 5 : Tertiary Industry States
  - Manipur, Bihar, Telangana, Kerala, Karnataka

Extra

State Specific Questions

- Why in spite of large geographical area Karnataka, MP, TN not able to generate more GDP from Crops?
- Why naturally so rich and beautiful places like Kerala, Uttrakhand, North East are behind in Hotel & Restaurants which are normally related to tourism?
- Kerala 4th Rank in construction can see larger impact in future on manufacturing. Is it so?
- How come Secondary education & GDP has so strong relation?

Task 11

Relevant Important Questions and insights for category separately

- C1
  - What kind of technical training and youth involvement C1 states are do that with lowest population they have highest GDP
  - What do they do to arrest the Primary & Upper Primary Edu dropout ?
- C2
  - C2 has higher per capita GDP compare to C3 but population of C2 is also high compare to C3. What are they doing to engage their youth?
  - What do they do to arrest Primary & Upper Primary education dropout?
- C3
  - Why more subsidy for C3?
  - Why even with the low population Secondary education drop is high for C3?
- C4
  - How come when population is high is Senior Secondary education dropout is exceptional less
  - They have approx 8 times population but GDP is not even double of C1
  - Why more subsidy for C4?

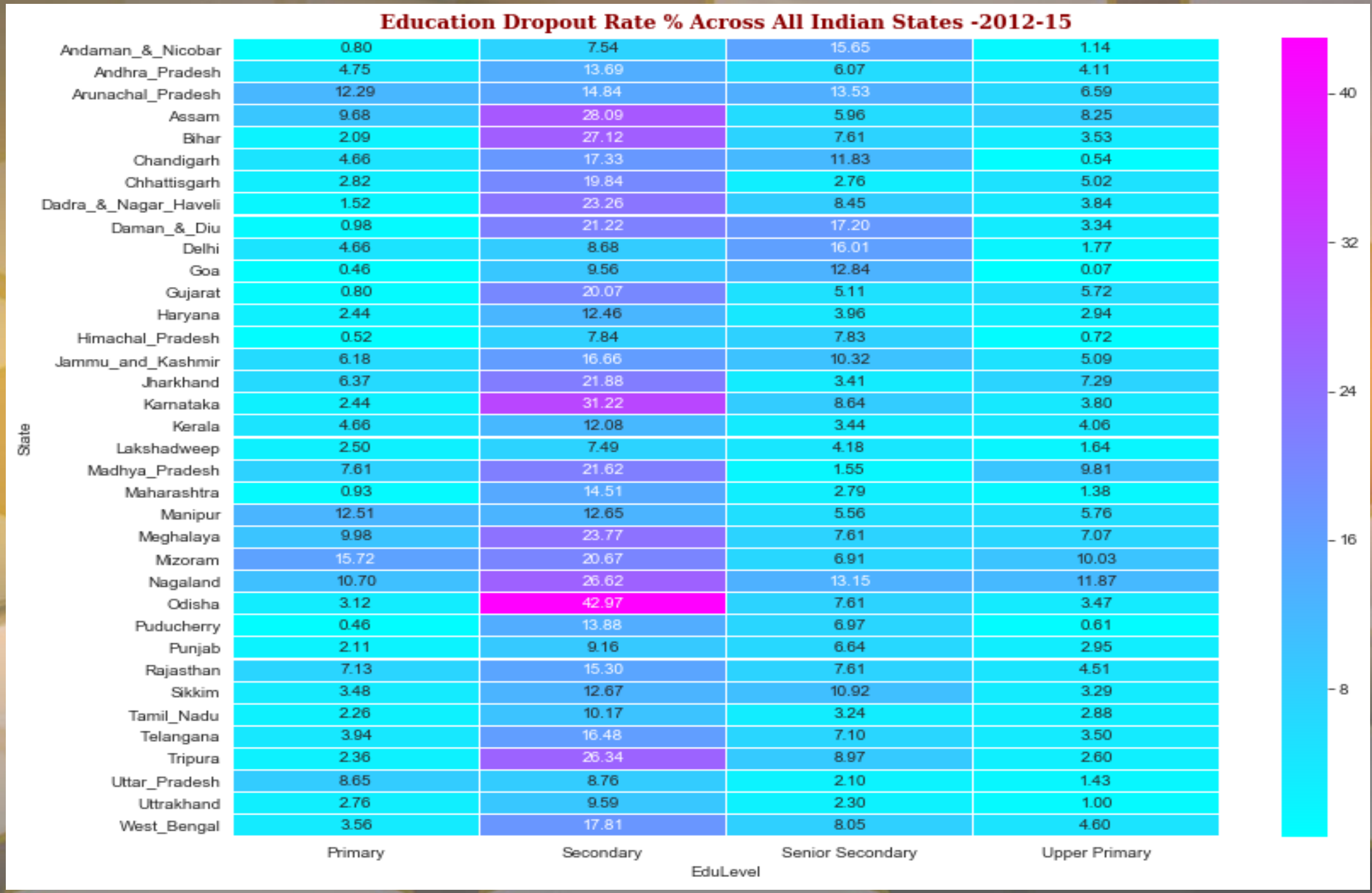
Task 12

At least two recommendations for each category to Improve the per capita GDP

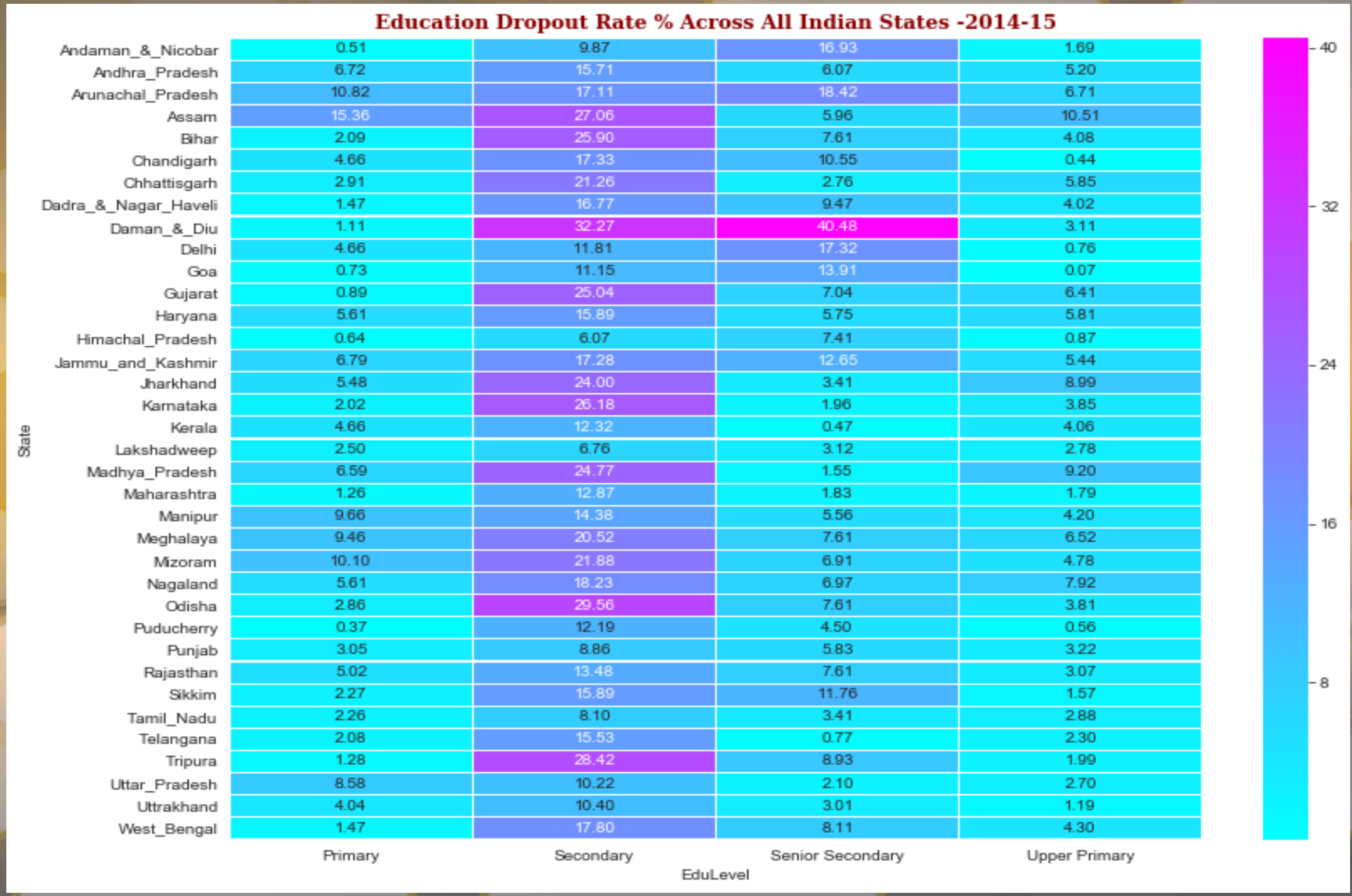
- Recommendations for C1 (100 Percentile)
  - Improve Financial Services, Road Transport, Food Processing & Storage related industries
  - Move towards rural development
- Recommendations for C2 (85 Percentile)
  - Improve Hotel & Restaurants, Communication, Public Administration related industries.
  - Move towards rural development
- Recommendations for C3 (50 Percentile)
  - Move towards high manufacturing & Real Estate related industries
  - Focus on Reducing Secondary Education dropout rate
- Recommendations for C4 (20 Percentile)
  - Move towards high manufacturing & Real Estate related industries
  - Focus on Reducing Secondary Education dropout rate

Part 2 : GDP and Education Drop-out Rates

Education Dropout Rate % - 2012-15

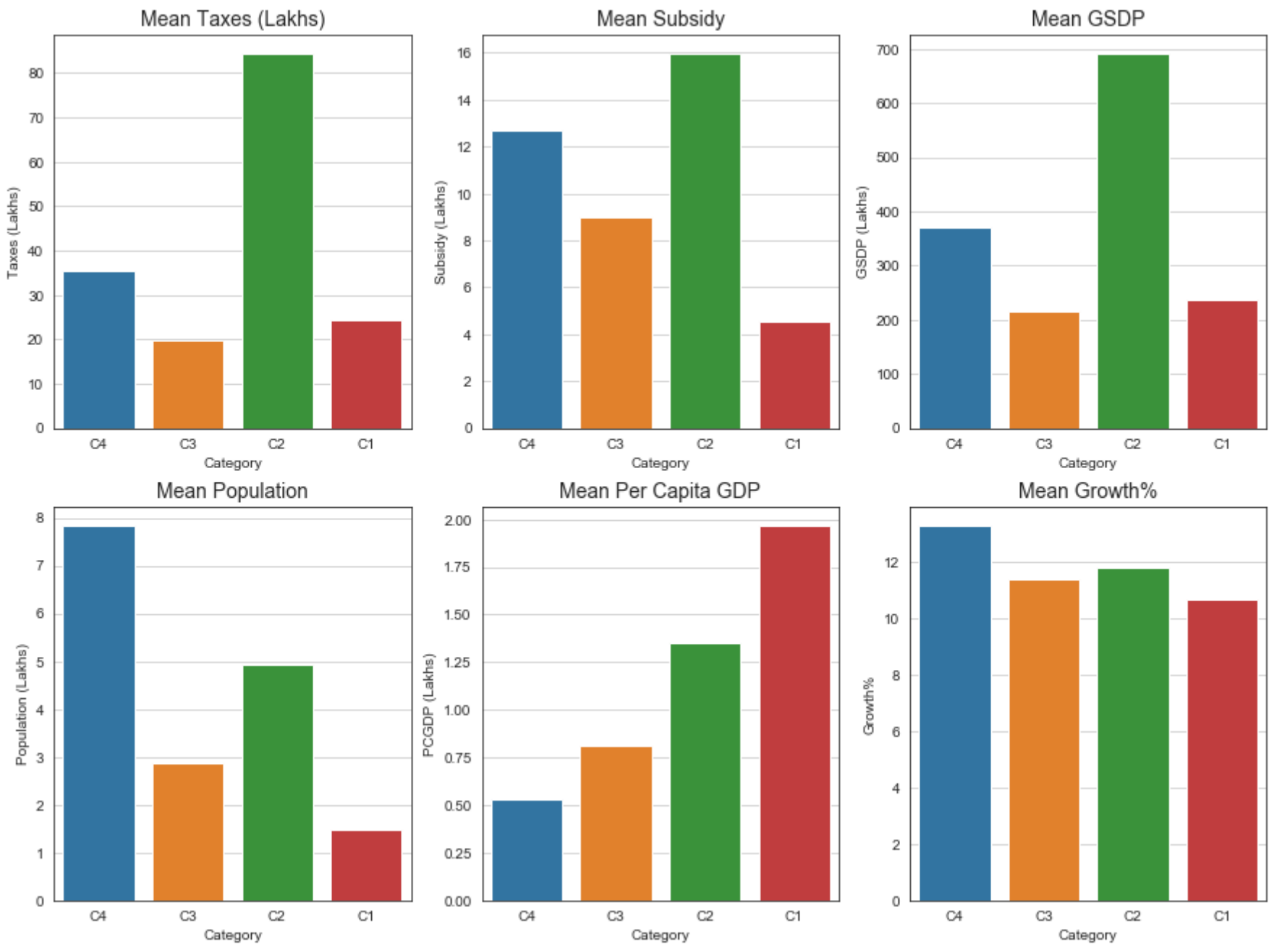


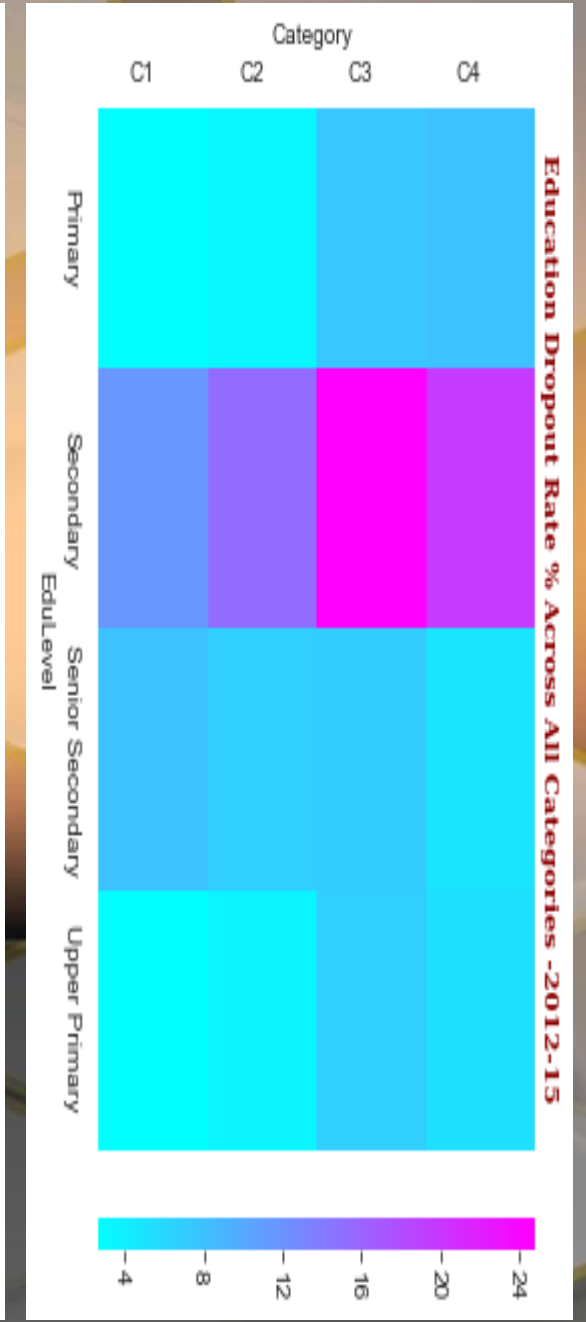
Education Dropout Rate % - 2014-15



Insight

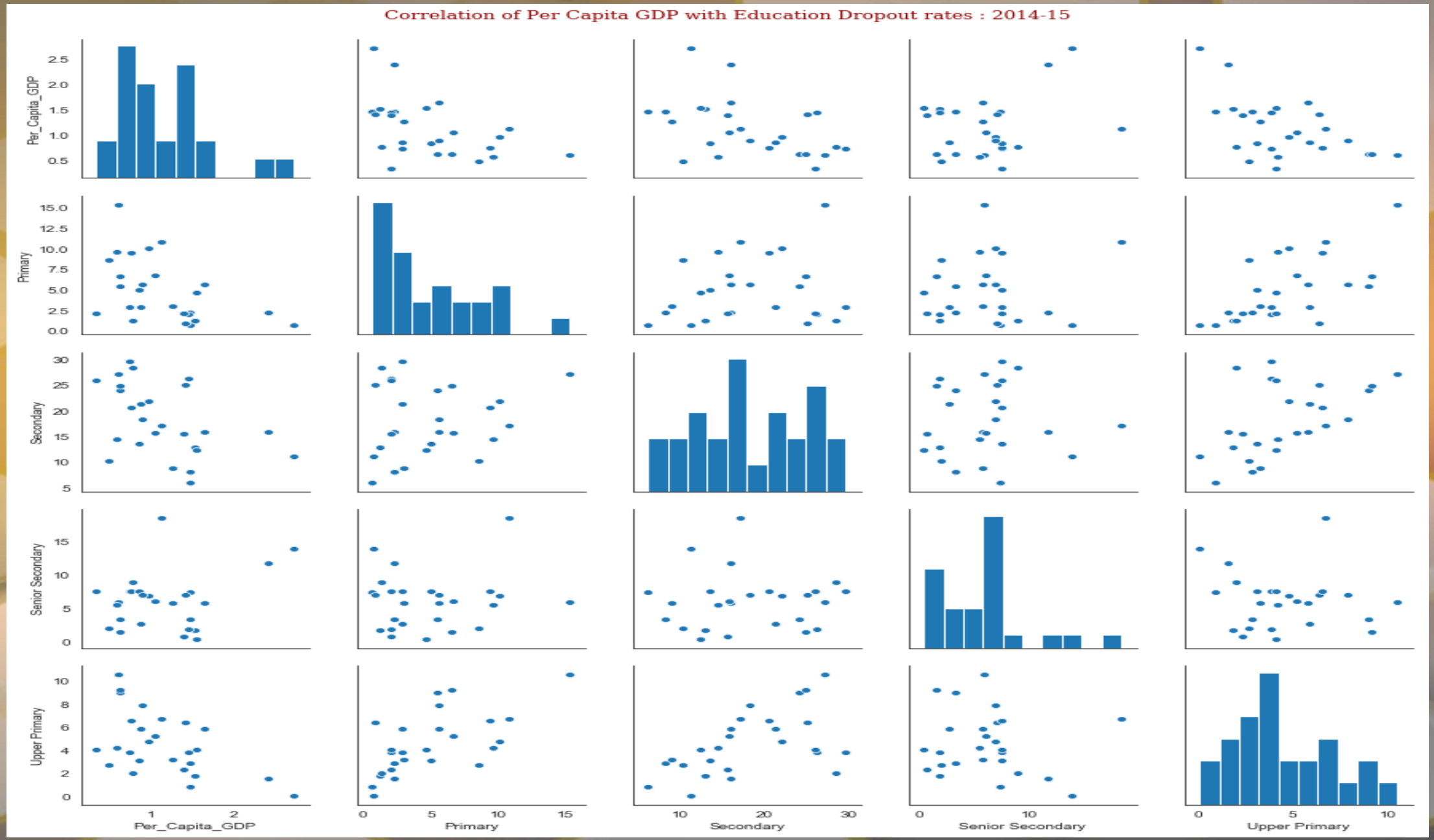
This is Very Interesting Graph



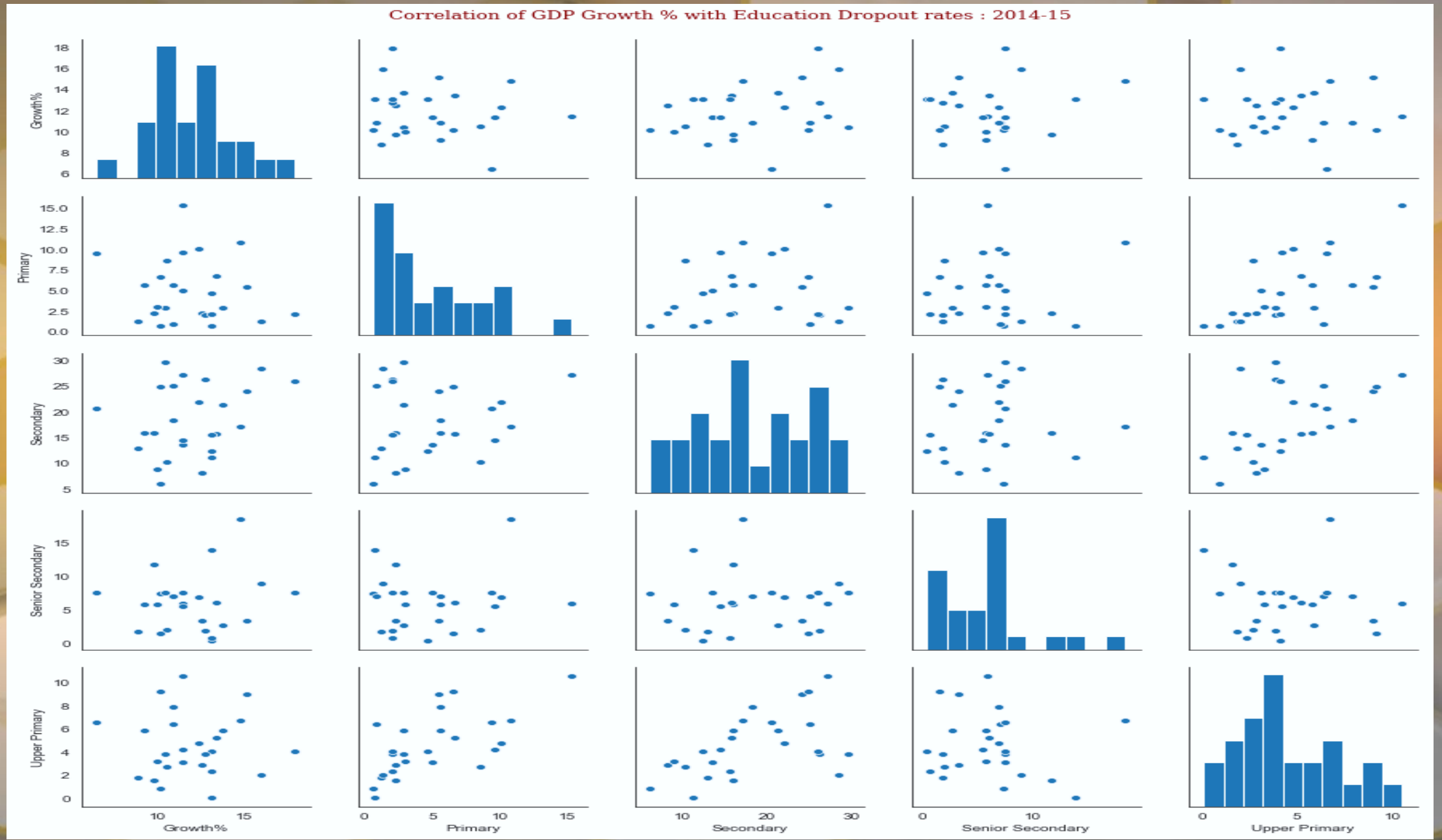


Task 1

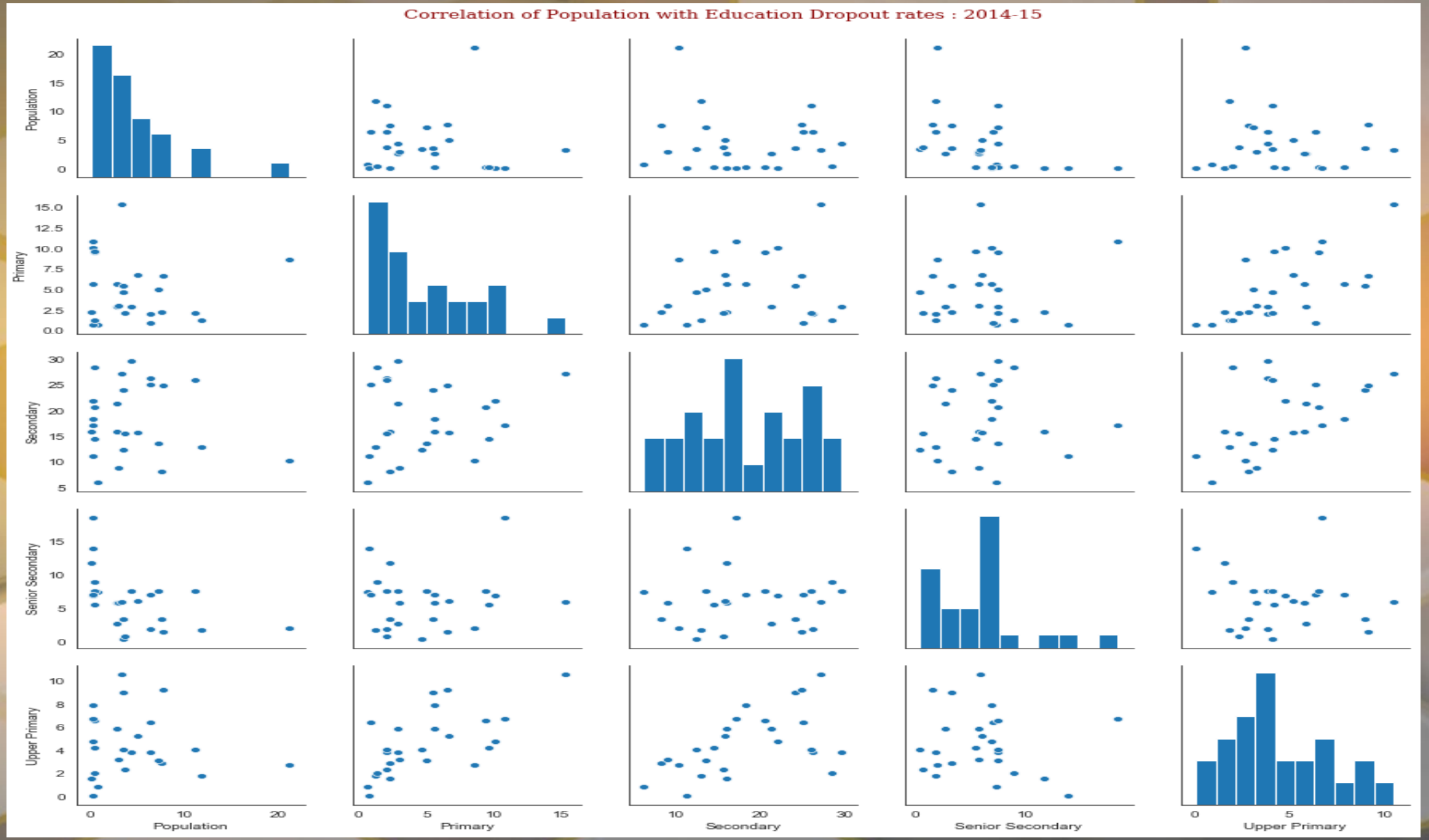
GDP/Capita to Education Dropout



GDP Growth Rate to Education Dropout

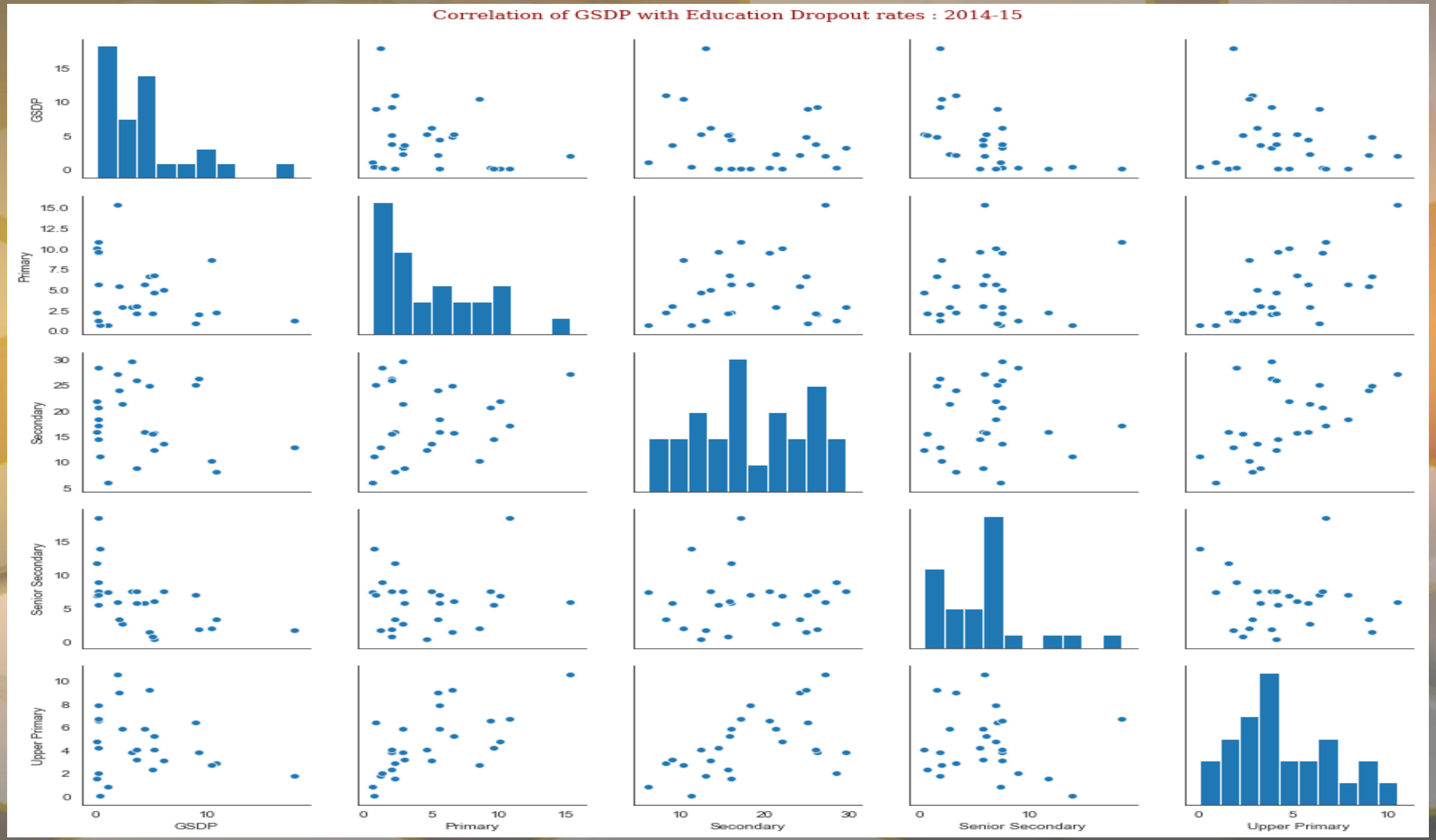


Population to Education Dropout



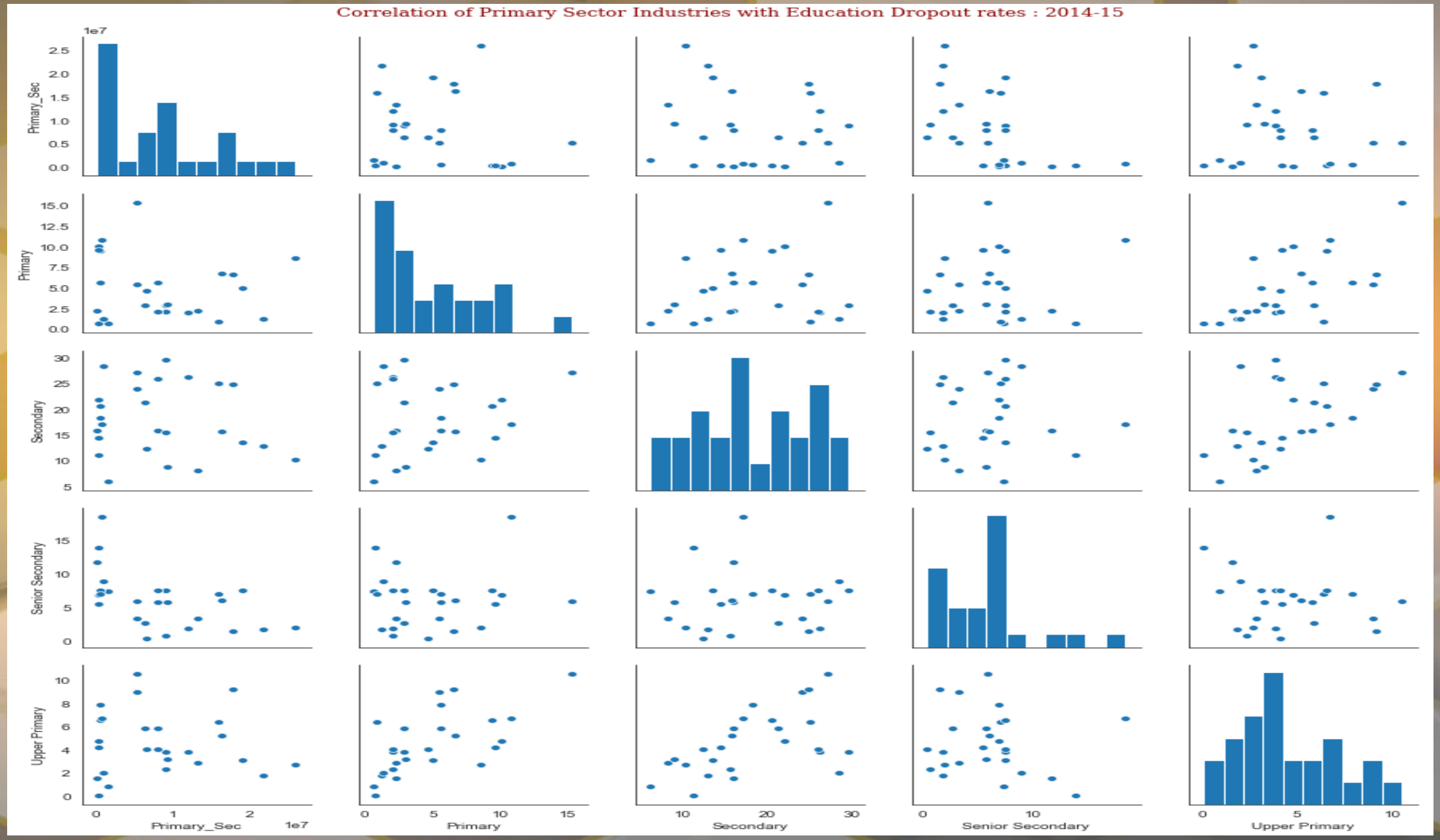
Extra

GSDP to Education Dropout

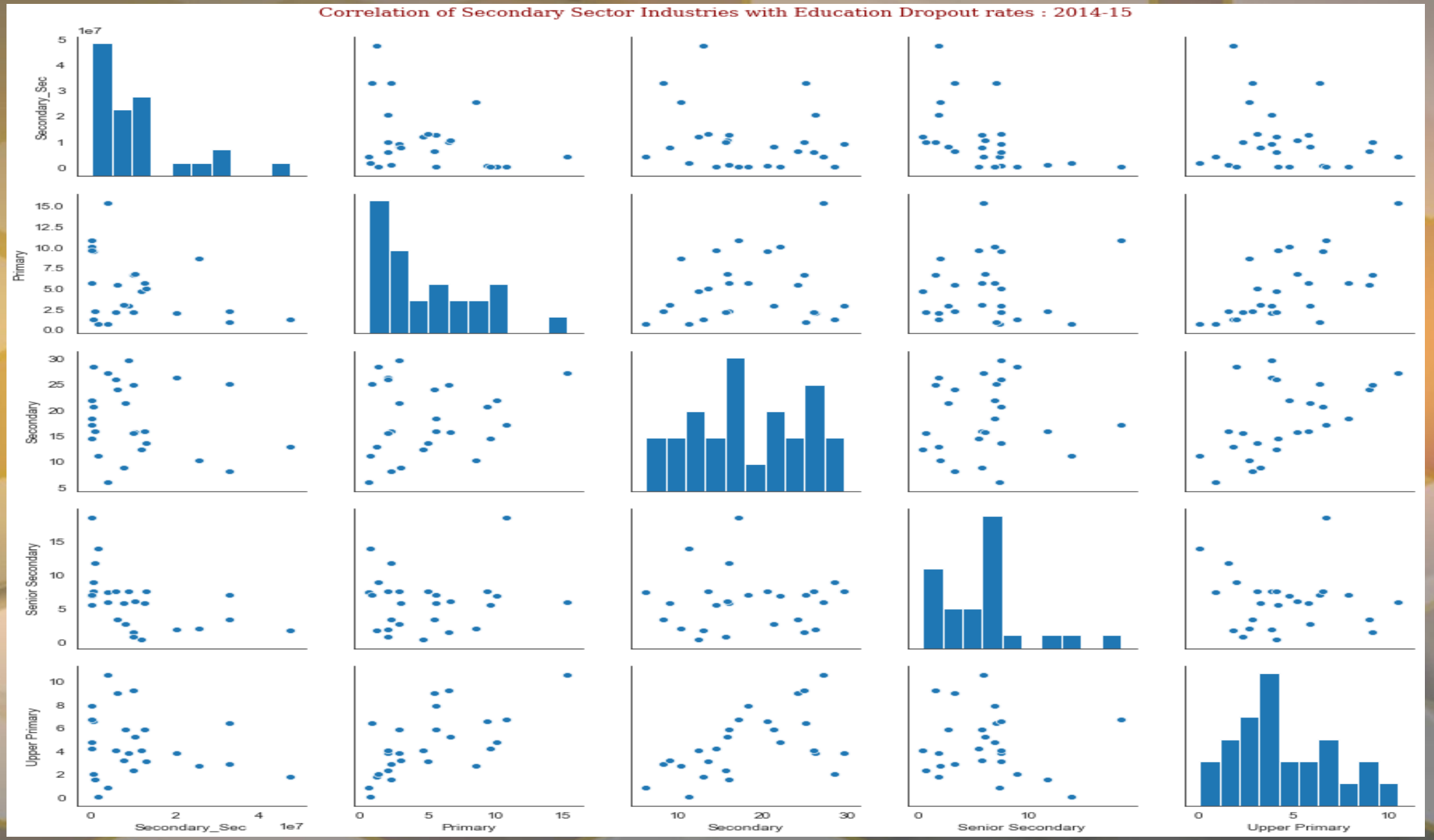


Extra

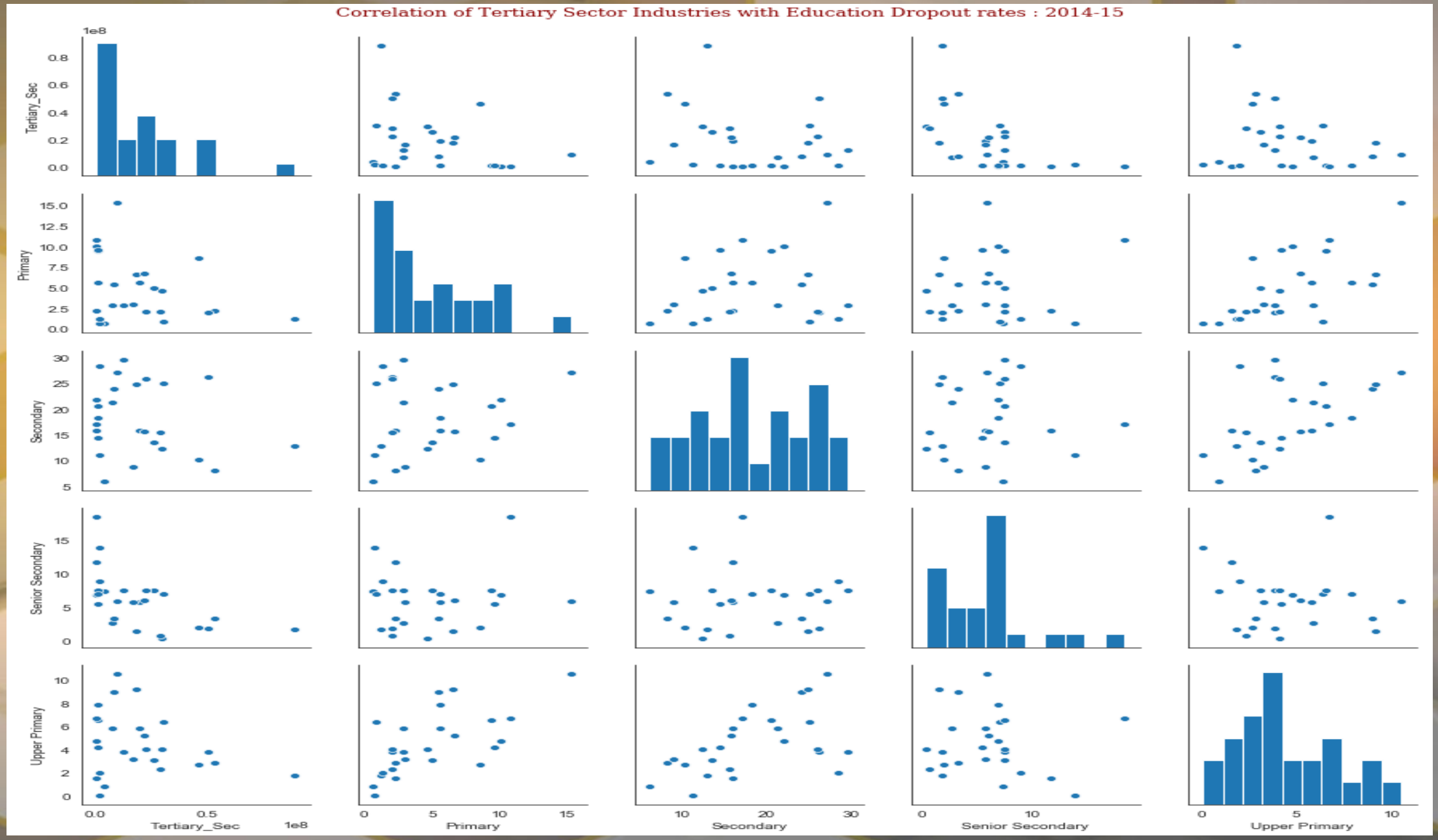
Primary Sector GDP to Education Dropout



Secondary Sector GDP to Education Dropout



Tertiary Sector GDP to Education Dropout



Insight

Sector wise Observations

- C1 & C2 Overall Education dropout is less
- C3 & C4 Overall Education dropout is very high
- C3 & C4 States has unusual high Secondary Edu. Dropout
- C3 & C4 States getting more subsidy compare to C1 & C2 states
- C4 States has least dropout rate for Senior Secondary and Upper Secondary Edu.
- C2 States: GSDP is more but Secondary & Sr. Secondary Education dropout is high of C2 states
- C4 States has overall high growth rate
- C1 States has lower growth rate
- Overall growth rate there is not much significant difference between all 4 categories

Insight

Observations of GDP & Edu. Dropout Relation

- Over all Secondary Education dropout is higher across India
- In NE & High Population Density states Primary education drop out is more compare to other states
- Once people enter into Upper Primary education then drop out rate is very less
- In 2014-15 Senior Secondary education drop is unusual in A&N Iceland, Arunanchal and Daman Diu
- Across all the states overall education dropout is very high for secondary education in comparison to other categories

Insight

Observations of GDP & Edu. Dropout Relation

- Overall dropout and **Per Capita GDP** has + relationship. However, Senior Secondary dropout and Per Capita GDP has strong + relation
- Overall dropout and **GDP growth rate** has + relationship. However, Secondary dropout and GDP growth rate has stronger +
- Primary education dropout and **GDP** and weak negative relationship
- Overall dropout and **Population** has no strong relationship of any kind
- Upper Primary education dropout and **Population** and has weak positive relationship
- Overall dropout and **GSDP** no strong relationship of any kind. However it is positve for Upper Primary Education dropout
- Overall dropout and **Primary Sector** has + relationship. It is strong for Upper Primary & Secondary
- Overall dropout and **Secondary Sector** has weak + relationship. It is strong for Upper Primary.
- Overall dropout and **Secondary Sector** has weak + relationship
- Secondary & Upper Primary dropout and **Tertiary Sector** has weak + relationship.

Task 3

Task 3: Form at least one reasonable hypothesis for the observations from the data

- If we get **more technical skill data** then we will be able see the impact of that on GDP in a better way
- **Drop out** from traditional schooling may have **chosen technical schooling** like ITI and it may have **improved GDP** in the subsequent year(s)
- Impact of education drop out on GDP is very less in the same year but more in the consecutive years. Dropout does not mean that people went for production nor it means that they went for technical education. So the relationship between dropout and GDP looks more complex.

Thank you

Namaste