GDP Assignment

# Assignment

You are working as the chief data scientist at NITI Aayog, reporting to the CEO.

The CEO of NITI Aayog has initiated a project to provide top-level recommendations to the Chief Ministers (CMs) of various states, to help them prioritize 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 analyse the GDP of the various states of India and suggest ways to improve it.

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, you 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.

## Datasets

1A. This dataset consists of the GSDP (Gross State Domestic Product) data for the states and union territories. <https://data.gov.in/resources/state-wise-gross-domestic-product-gdp-current-price-yearly-basis>

1B: 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. You are expected to read the dataset for the available states and join these (in Python) if needed.

2. dropout rates in schools and colleges. <https://data.gov.in/resources/state-ut-wise-average-annual-drop-out-rate-2012-13-2014-15-ministry-human-resource>

First, you need to load the data in Python properly and then clean it. This also involves the treatment of missing values, you can choose to drop the row or column as well. Remember this will affect your next analysis and results drastically.

Plot a graph for rows " % Growth over previous year" for all the states (not union territories) whose data is available, use as much data as possible for this exercise. Use the best fit line to represent the growth for each state. Draw a similar line graph for the nation as well.

* How will you compare the growth rates 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.
* What is the Nation's growth rate?
* What has been the growth rate of your home state, and how does it compare to the national growth rate?

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)
* Identify the top 5 and the bottom 5 states based on total GDP.
* What insights can you draw from this graph? What states are performing poorly? (Remember: this will not be solely based on total GDP)

# Annexure

## A brief about NITI Aayog

NITI Aayog (National Institution for Transforming India) is the policy think tank of the Government of India. It provides strategic inputs to the central and the state governments to achieve various development goals.

In the past, NITI Aayog has played an important role in initiatives such as Digital India, Atal Innovation Mission and various agricultural reforms and have designed various policies in education, skill development, water management, healthcare, etc.

NITI Aayog was established to replace the Planning Commission of India, which used to follow a top-down model for policy-making, i.e., it designed policies at the central level (such as the 5-year plans). On the other hand, NITI Aayog designs policies specific to the different states or segments of the economy.

Former Finance Minister, Arun Jaitley, made the following observation on the necessity of creating NITI Aayog: "The 65-year-old Planning Commission had become a redundant organisation. It was relevant in a command economy structure, but not any longer. India is a diversified country and its states are in various phases of economic development along with their own strengths and weaknesses. In this context, a one-size-fits-all approach to economic planning is obsolete..."

## Understanding GDP

Gross domestic product (GDP) at current prices is the GDP at the market value of goods and services produced in a country during a year. In other words, GDP measures

**Monetary value of final goods & services produced by a country/state in a given period**

GDP can be broadly divided into goods and services produced by three sectors: (a) the primary sector (agriculture) (b) the secondary sector (industry), and (c) the tertiary sector (services).

It is also known as nominal GDP. More technically, real GDP takes into account the price change that may have occurred due to inflation. This means that the real GDP is nominal GDP adjusted for inflation.

In this assignment, we will use the nominal GDP. Also, we will consider the financial year 2015-16 as the base year, as most of the data required for this exercise is available for the aforementioned period.

## Per Capita GDP and Income

Total GDP divided by the population gives the per capita GDP, which roughly measures the average value of goods and services produced per person.

The per capita income is closely related to the per capita GDP (though they are not the same). In general, the per capita income increases when the per capita GDP increases, and vice-versa. For instance, in the financial year 2015-16, the per capita income of India was ₹93,293, whereas the per capita GDP of India was $1717, which roughly amounts to ₹1,11,605. India ranks 11th in the world in terms of total GDP; however, it lies at the 139th position in terms of per capita GDP.

**Read More:** <https://en.wikipedia.org/wiki/Gross_domestic_product>