Population of India (1961 - 2021)

June 30, 2023

1 Population of India

1.1 Making a code that gives population data using the growth rate and initial population.

1.1.1 - Import required packages

```
[1]: import csv as csv
     import numpy as np
     import pandas as pd
     import matplotlib.pyplot as plt
```

1.1.2 - Read the csv file and load data into empty arrays

```
[2]: year_raw = []
     rate_raw = []

     with open('pop-india.csv', newline = '') as csvfile:
         data = csv.reader(csvfile)
         next(data)    # skip header
         for row in data:
             year_raw.append(row[0])
             rate_raw.append(row[1])

     year = []
     rate = []

     for i in range(len(rate_raw)):
         year.append(int(year_raw[i]))
         rate.append(float(rate_raw[i]))
```

1.1.3 - Population for each year

- Using the population data from an archieved article by the Ministry of Finance, Government of India, we take the population of India in the year 1961 as approximately 439 million.

- This initial value is employed to calculate the approximate population for the year range using the growth rate data.

```
[3]: population = [439235000]

     for i in range(len(year)-1):
         population.append(round(population[i] + population[i] * rate[i] * 0.01))

     population_billion = [i * 1e-9 for i in population]
```

1.1.4 - Visualizing the population data

```
[4]: fig = plt.figure(figsize = (20,10))
     plt.plot(year, population_billion, linewidth = 3, linestyle = "--", color =␣
      ↪"#ff0000")
     plt.title('Population of India (1961 - 2021)', fontsize = 25)
     plt.ylim(0, 1.6)
     plt.xticks(fontsize = 20)
     plt.yticks(fontsize = 20)
     plt.xlabel('year', fontsize = 25)
     plt.ylabel('population (in billion)', fontsize = 25)
     plt.grid(True, 'both', linestyle = ':', alpha = 0.5)
```
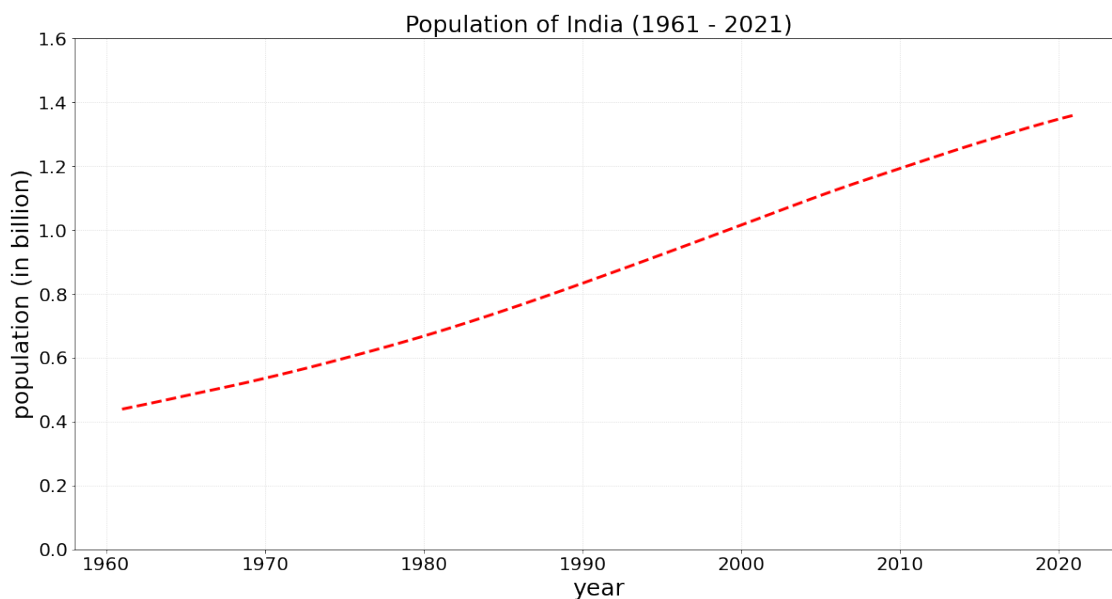

1.1.5 - Save data as .csv file

```
[5]: yr = np.asarray(year)
     pop = np.asarray(population)

     df = pd.DataFrame({"year" : yr, "population" : pop})
     df.to_csv("population_cleaned.csv", index=False)
```