

# Practical-1

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## Question

For a given dataset of the US Population (in millions), perform the following tasks in the R environment:

- (a) Entered the data into an Excel file.
- (b) Import the data from the Excel file into the R working directory.
- (c) Call the suitable package from the R library for time series analysis.
- (d) Convert the dataset into a time series object and explain the nature of the data in terms of its sampling frequency.
- (e) Plot the data and identify the dominating component(s) in the data set.

## Objective

To perform time series analysis on US Population data by importing data from Excel, converting it into a time series object, and visualizing the components using R.

## R-Code:-

### LIBRARY

```
library(forecast)
```

### CODE:-

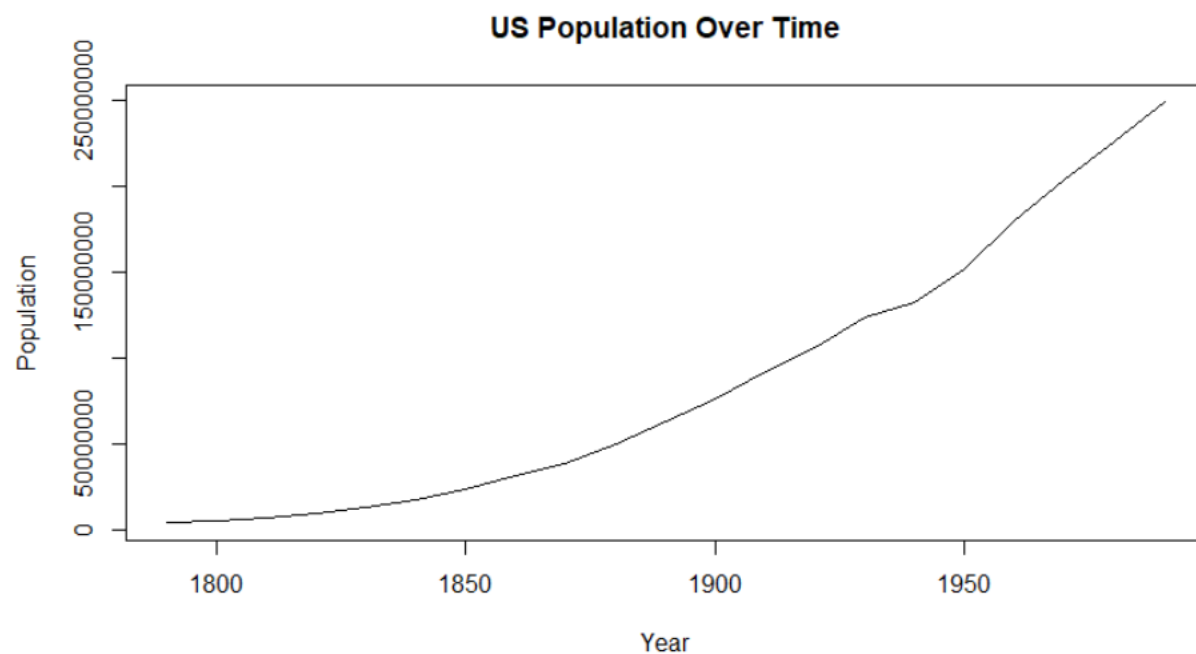
```
install.packages("forecast")
```

```
library(forecast)
```

```
population_data <- us_population  
print(population_data)
```

```
population_ts <- ts(  
  population_data$Population,  
  start = 1790,  
  frequency = 0.1  
)
```

```
plot(  
  population_ts,  
  main = "US Population Over Time",  
  xlab = "Year",  
  ylab = "Population",  
)
```



## Conclusion

The dataset was successfully converted into a time series object starting from the year 1790. With a frequency of 0.1, the sampling represents decennial data (every 10 years). The

resulting plot reveals a strong upward secular trend as the dominating component, showing consistent population growth over time.