Practical – 3

Praveer Raj

Roll: 1

Reg. No.-230957002

Question:-

Consider the following datasets from the R library and write R code to decompose the time-series data into its trend, seasonal, and residual components. Furthermore, identify the dominating component(s) in the dataset:

(a) Nottem data

(b) AirPassengers data

Title:

Decomposition of Time Series Data using R

Objective:

To decompose the given time series datasets into trend, seasonal, and residual components and identify the dominating component(s).

Dataset: Nottem

R Code:-

(A):

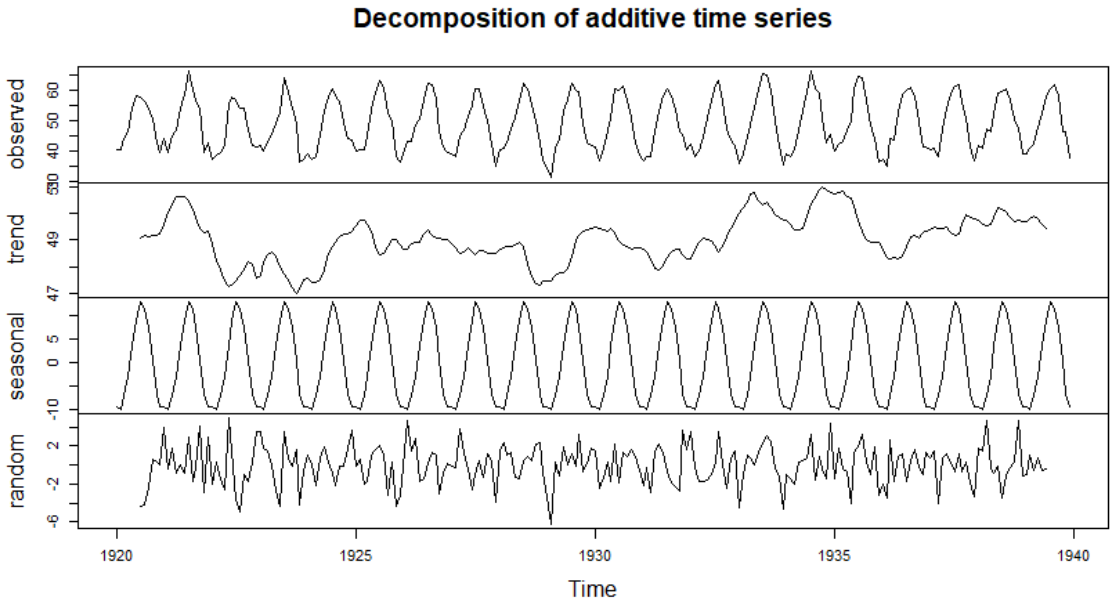
```
rm(list = ls())
library(stats)
data(nottem)
nottem_ts <- ts(nottem, start = c(1920, 1), frequency = 12)

plot(nottem_ts,
    main = "Nottem Monthly Temperature Data",
    xlab = "Year",
```

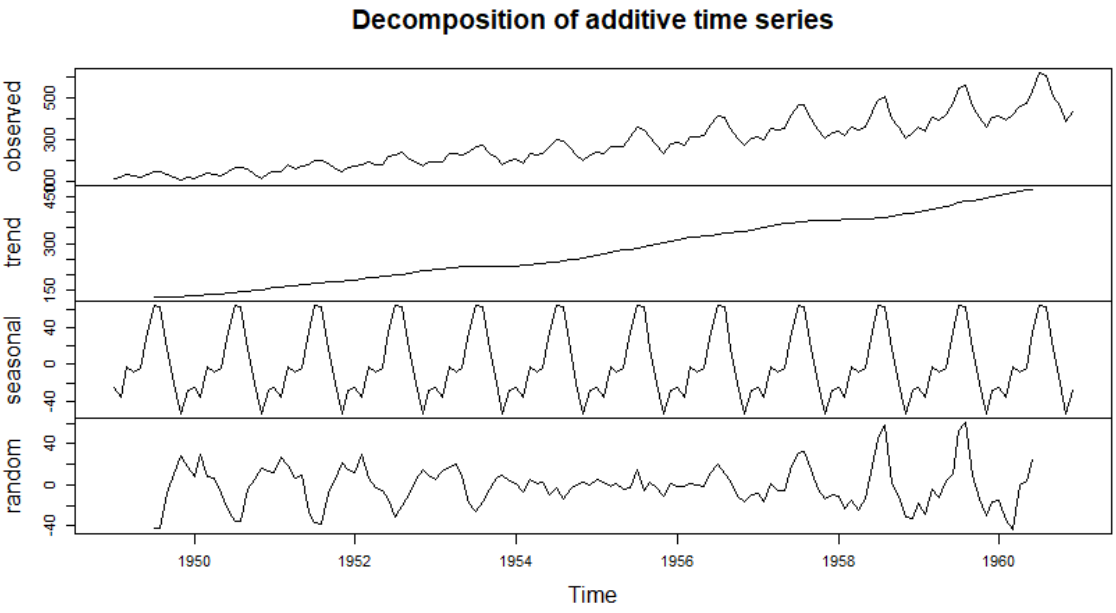
```
    ylab = "Temperature")
nottem_decomp <- decompose(nottem_ts)
plot(nottem_decomp)
nottem_decomp
```

(B):

```
rm(list = ls())
 library(stats)
 data(AirPassengers)
 air_ts <- ts(AirPassengers, start = c(1949, 1), frequency = 12)
 plot(air_ts,
    main = "AirPassengers Time Series",
    xlab = "Year",
    ylab = "Number of Passengers")
 air_decomp <- decompose(air_ts)
 plot(air_decomp)
air_decomp
```

Output:-





Conclusion:

The Nottem dataset shows a strong seasonal component with minor trend and random variations. Seasonality is the dominating component.