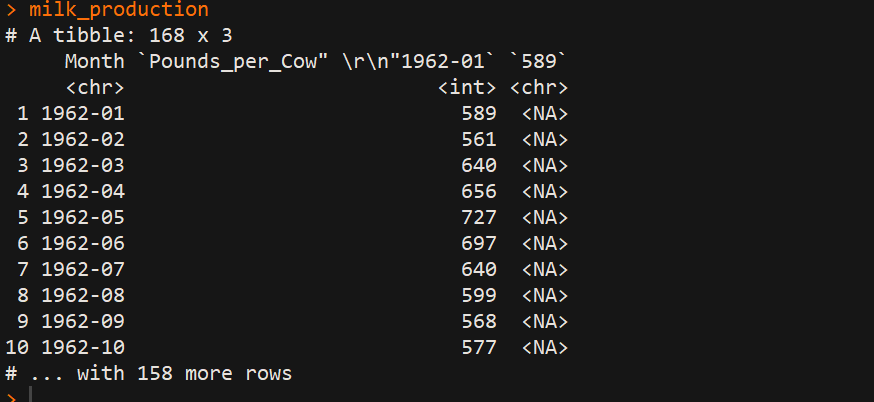


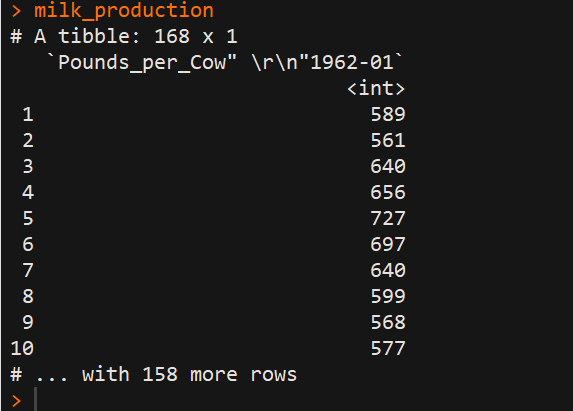
*#import the dataset and make some changes*

library(readr)

milk\_production <- read\_csv("C:/Users/bvkka/Desktop/ISL-Deep Medhi/assignment3/milk-production(1).csv")



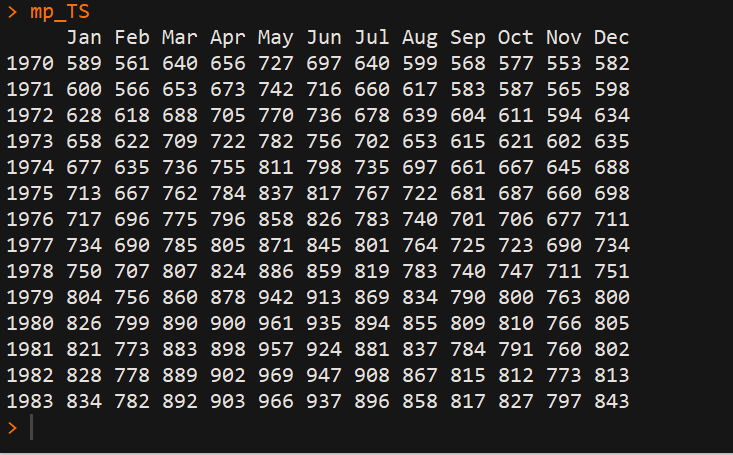
milk\_production<-milk\_production[,2]



milk\_production\_timeseries<-ts(milk\_production)

*#contains monthly milk productions for January 1970-Decemeber 1983*

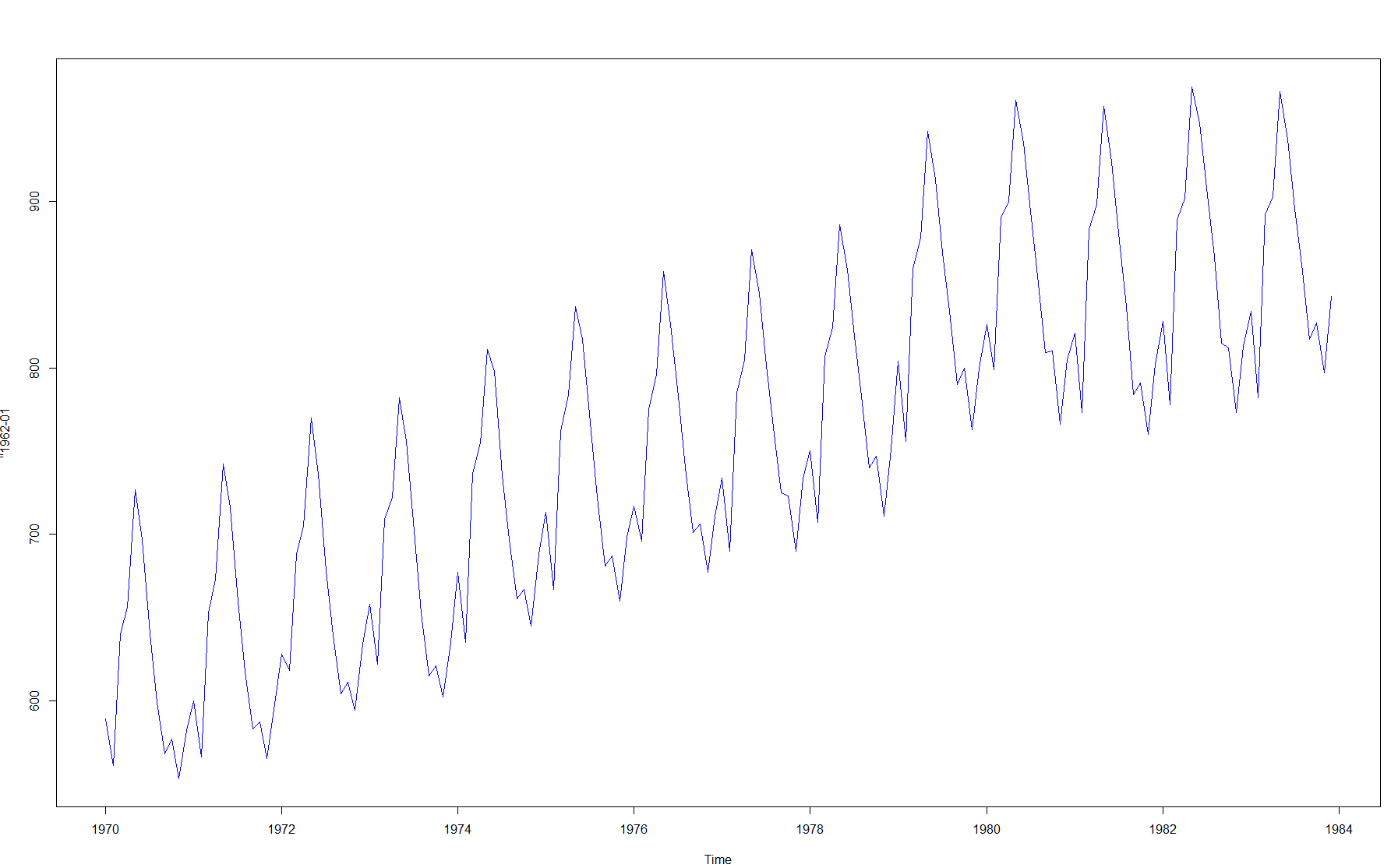
mp\_TS<-ts(milk\_production,frequency = 12,start=c(1970,1))



*#plotting time series*

plot.ts(milk\_production\_TS)

lines(mp\_TS,col="blue")



*## a. ##*

*#\*\*\*Simple Moving Average(SMA)\*\*\*# ->it is used to smooth time series data*

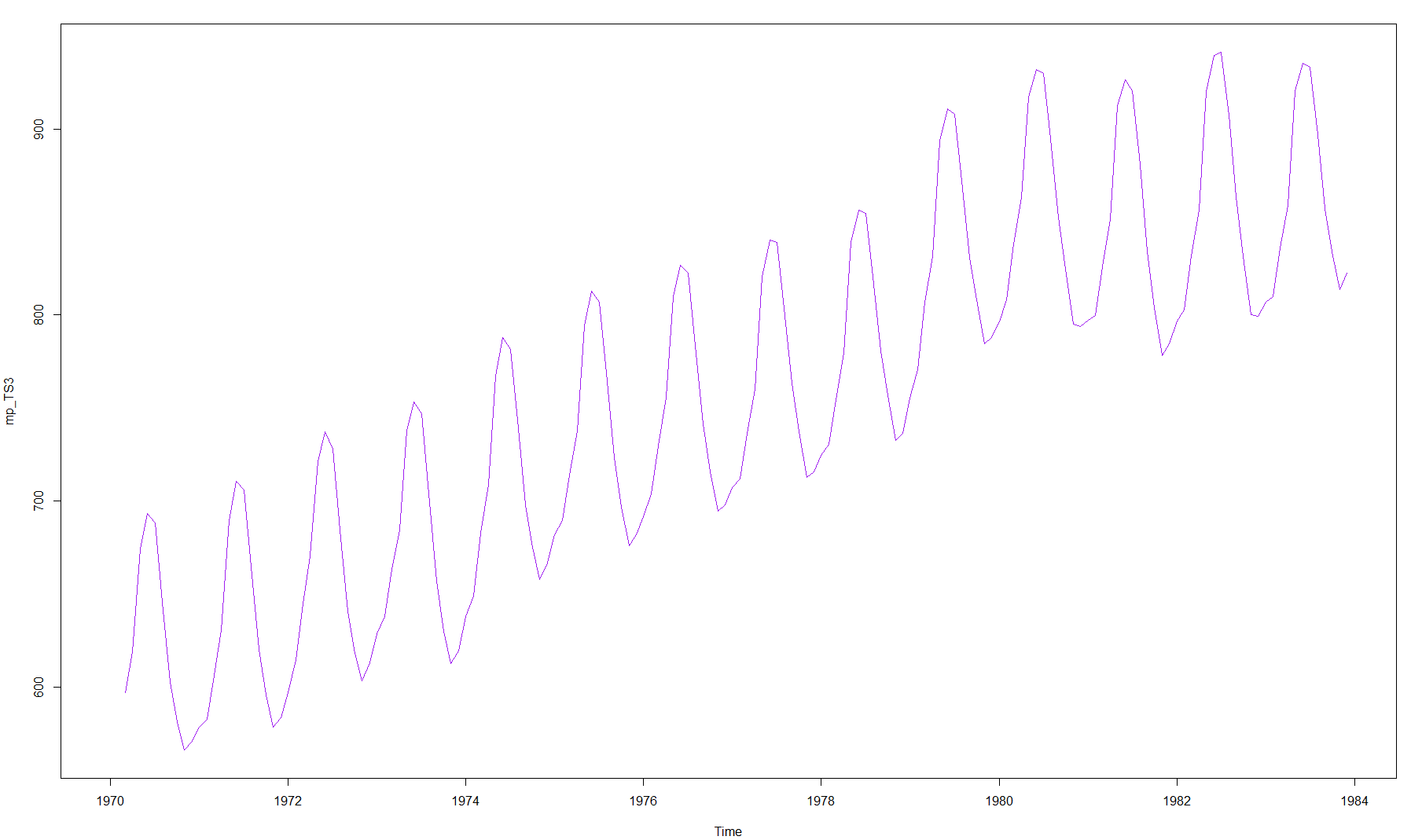
*#install.packages("TTR")*

library("TTR")

mp\_TS3<-SMA(milk\_production\_TS,n=3)

plot.ts(mp\_TS3)

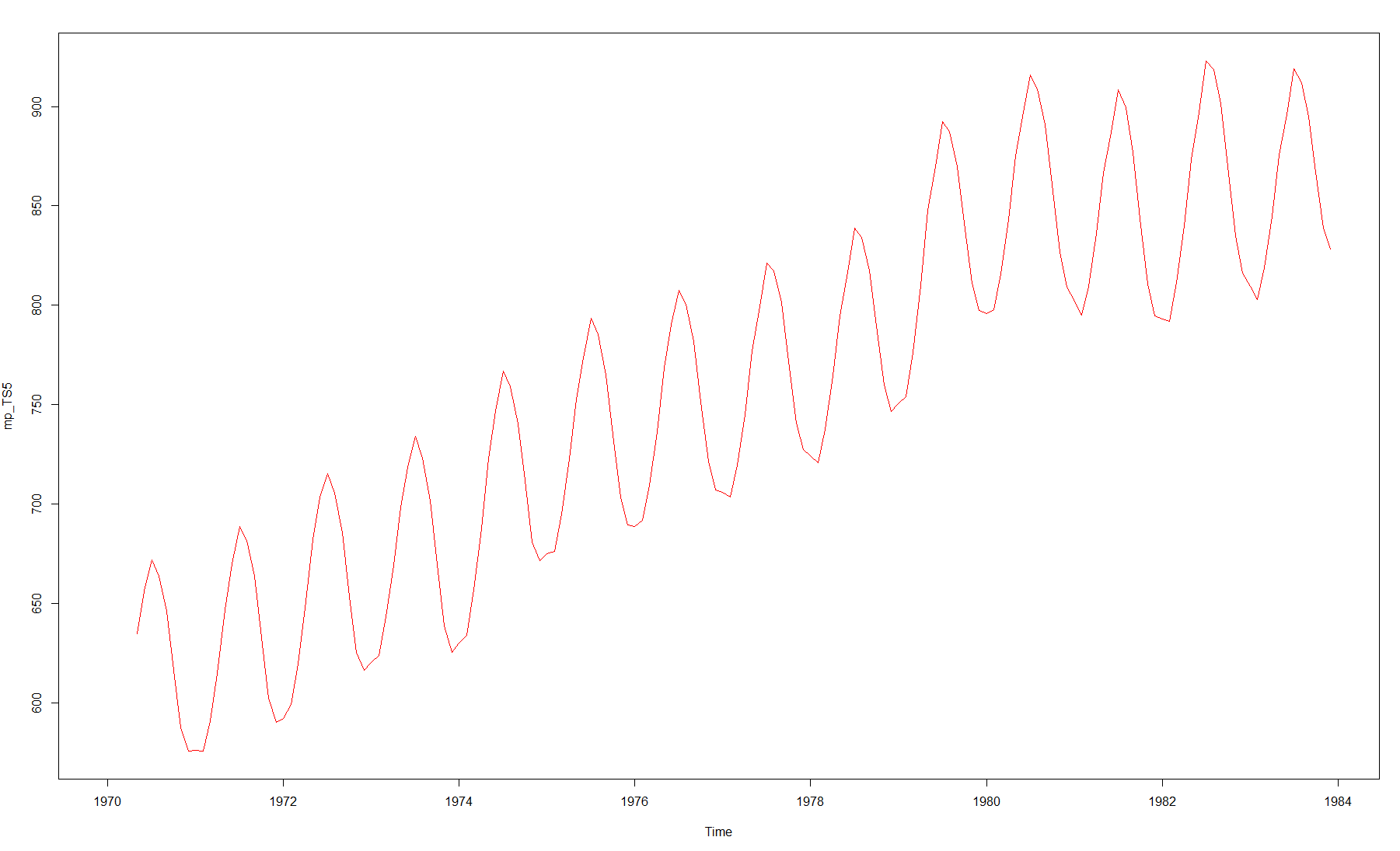
lines(mp\_TS3,col="purple")



mp\_TS5<-SMA(milk\_production\_TS,n=5)

plot.ts(mp\_TS5)

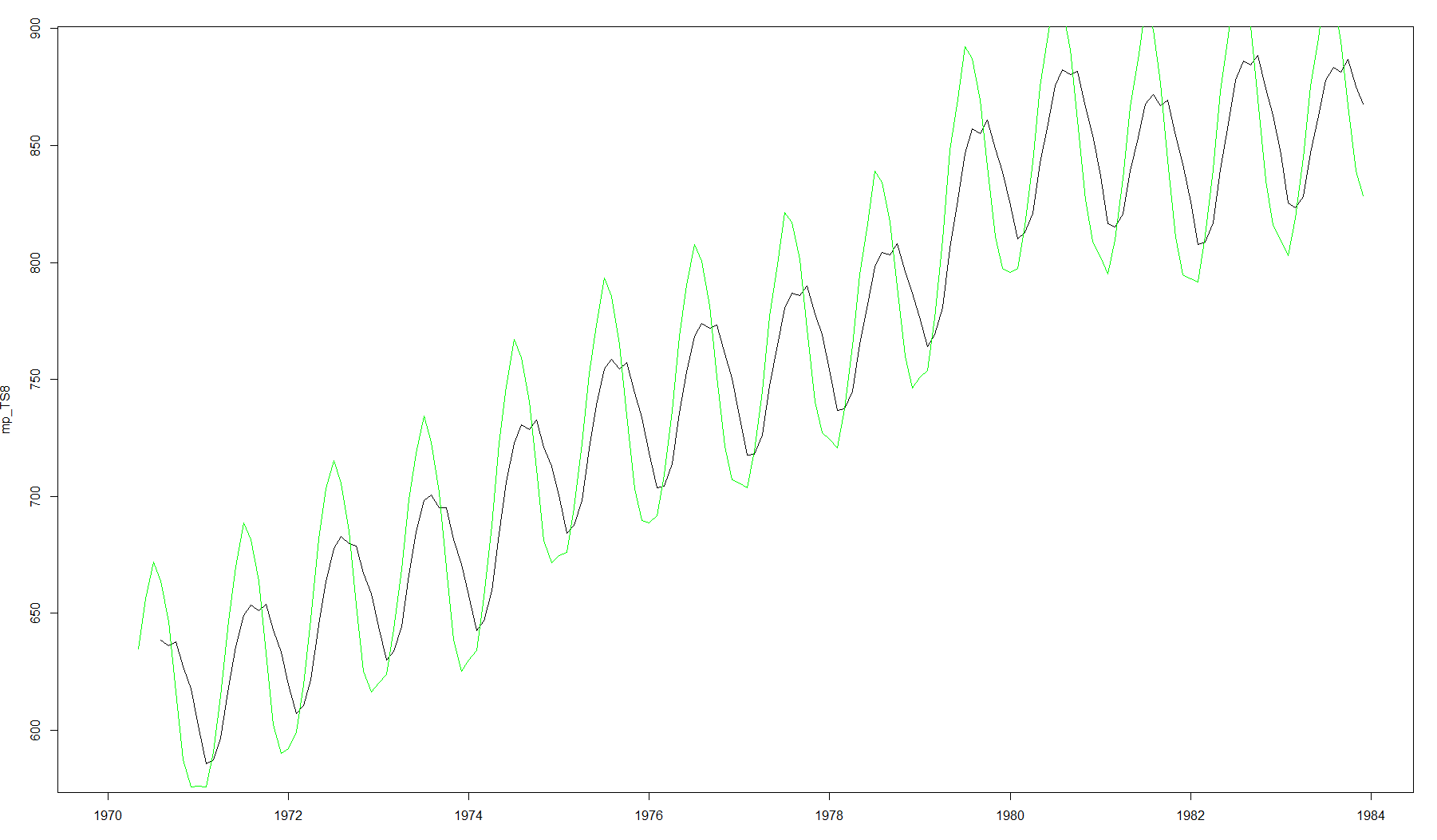
lines(mp\_TS5,col="red")



mp\_TS8<-SMA(milk\_production\_TS,n=8)

plot.ts(mp\_TS8)

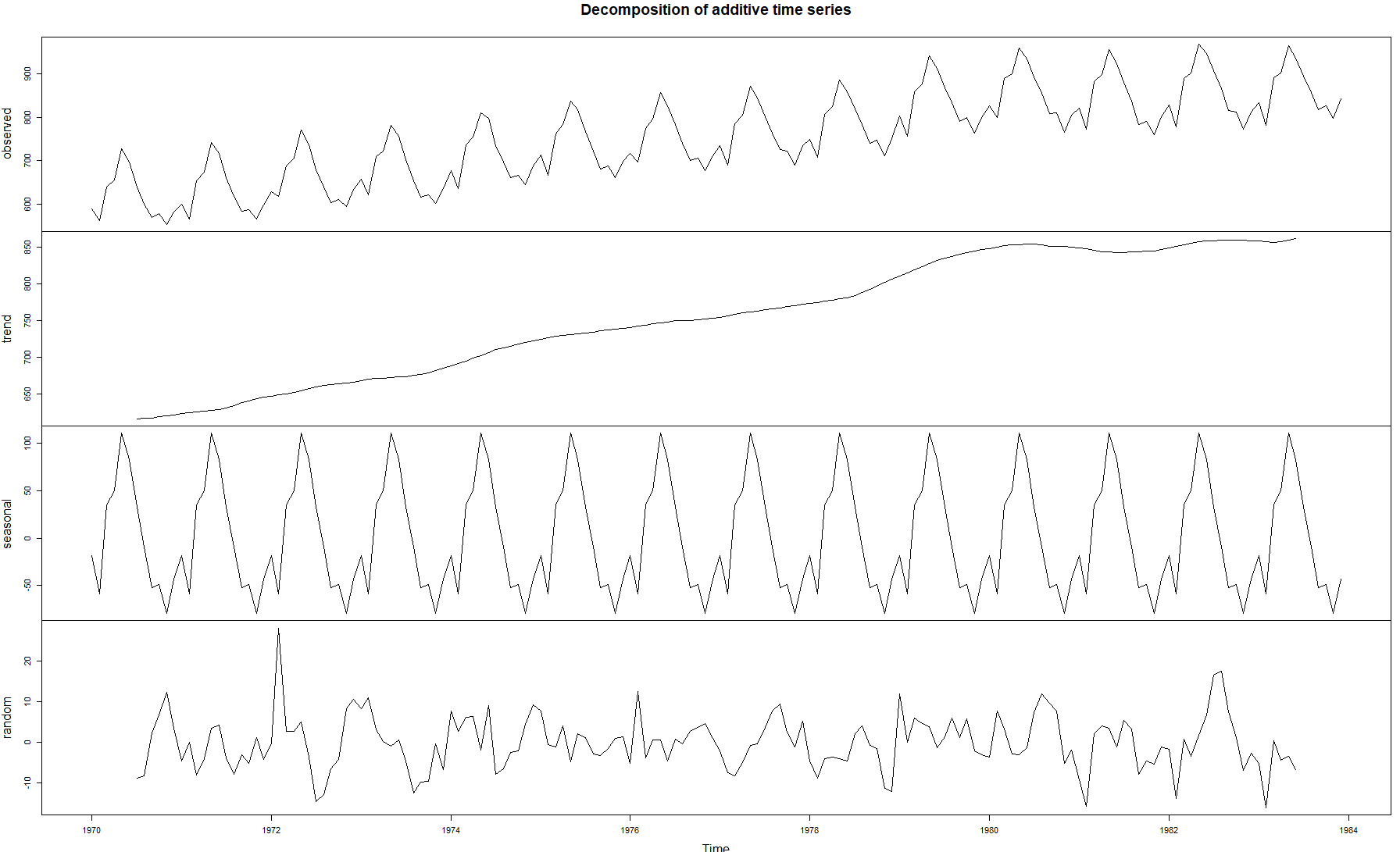
lines(mp\_TS5,col="green")



*#To estimate the trend component and seasonal component of a seasonal time series that can be described using an additive model, we can use the “decompose ()” function in R. This function estimates the trend, seasonal, and irregular components of a time series that can be described using an additive model###*

mp\_decompose=decompose(milk\_production\_TS)

plot(mp\_decompose) *#The plot above shows the original time series (top), the estimated trend component (second from top), the estimated seasonal component (third from top), and the estimated irregular component (bottom)##*



*## b. ##*

*#\*\*\*\*Forecasts suing Exponential Smoothing\*\*\*###*

mp\_exp=HoltWinters(mp\_TS,beta=FALSE,gamma = FALSE)

plot(mp\_exp) *#The plot shows the original time series in black, and the forecasts as a red line. The time series of forecasts is much smoother than the time series of the original data here.*

lines(mp\_exp$fitted[,1],col="red")

