Forecast Monthly electricity expenditure
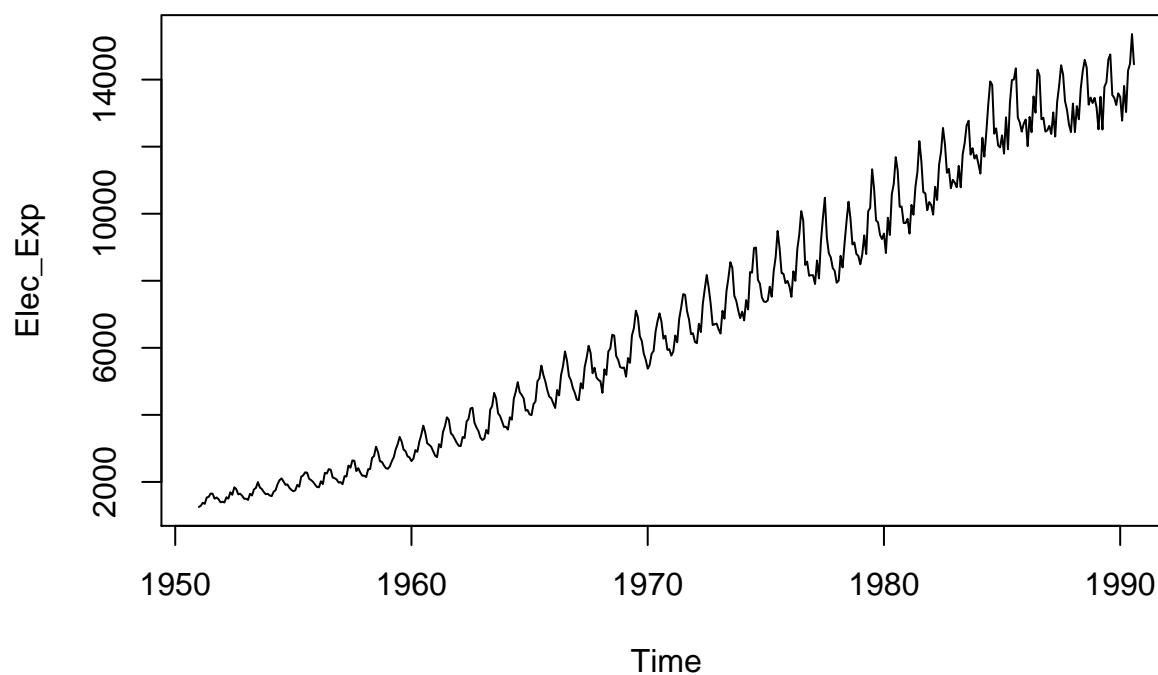
```r
directory_req <- 'C:\\R_working\\'
knitr::opts_knit$set(root.dir = directory_req)

filename <- 'monthly_electricity.txt'


input_data <- read.table(file = filename, sep = " ", skip = 1, col.names = c('Elec_Exp'))
print(head(input_data,10))
```
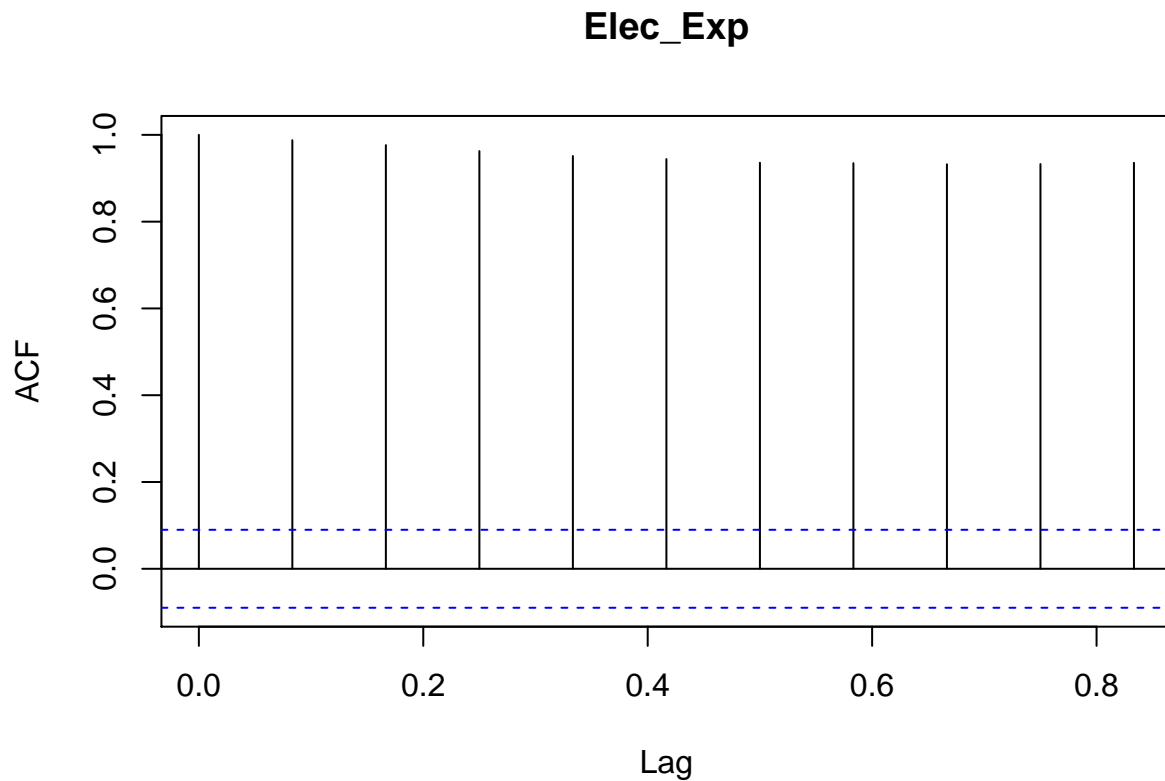
```
##      Elec_Exp
## 1        1254
## 2        1290
## 3        1379
## 4        1346
## 5        1535
## 6        1555
## 7        1655
## 8        1651
## 9        1500
## 10       1538
```

```r
x <- ts (input_data, frequency = 12, start = c(1951,1), end = c(1990, 8))
plot(x)
```

```r
acf(x,lag.max = 10,plot = TRUE)
```

Elec_Exp


```r
#pick arbitrary k (between 1960 and 1988)
k=1971
x_train <- ts (input_data, frequency = 12, start = c(1956), end = c(1971))

# predictions to be made for K+1 using holtwinters
# first range of alpha beta = 0.2,0.2, gamma = 0.1

x_fit<-HoltWinters(x_train,alpha = 0.2, beta = 0.2, gamma = 0.1,seasonal="additive")

# second range of alpha beta = 0.9,0.9, gamma = 0.1

x_fit1<-HoltWinters(x_train,alpha = 0.9, beta = 0.9, gamma = 0.1,seasonal="additive")

#plot of forecast versus actual time series
library("forecast")
```

```
## Loading required package: zoo

##
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':
##
##      as.Date, as.Date.numeric

## Loading required package: timeDate
```
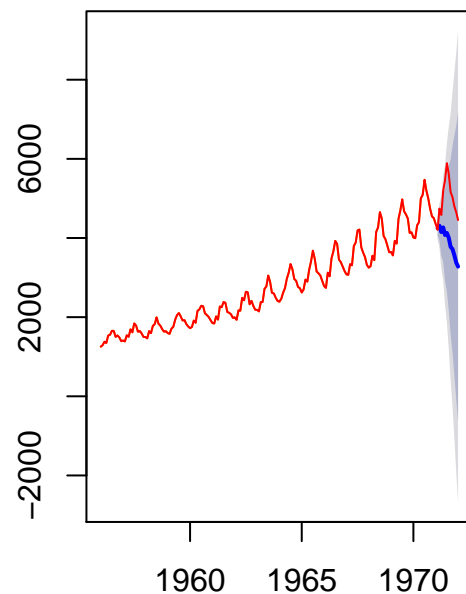
```
## This is forecast 7.3
par(mfrow=c(1,2))
plot(forecast(x_fit,h=12),type="l",col="orange")
lines(ts (input_data, frequency = 12, start = c(1956), end = c(k+1)),col="red")

plot(forecast(x_fit1,h=12),type="l",col="orange")
lines(ts (input_data, frequency = 12, start = c(1956), end = c(k+1)),col="red")
```
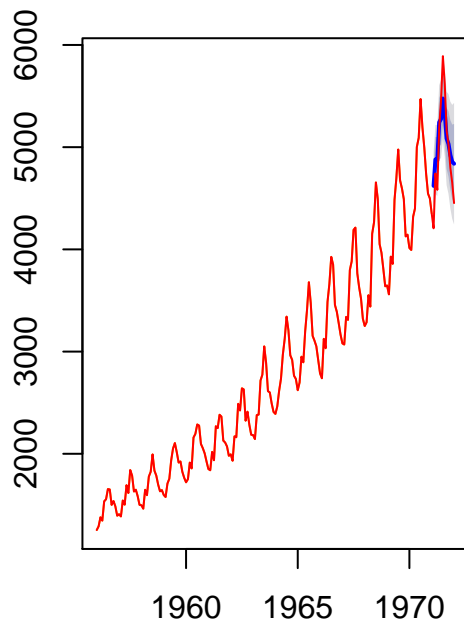

Forecasts from HoltWinters   **Forecasts from HoltWinters**

```
print(x_fit$SSE)
```

```
## [1] 4683232
```

```
print(x_fit1$SSE)
```

```
## [1] 3563559
```

```
#pick arbitrary k (between 1960 and 1988)
k=1988
x_train <- ts (input_data, frequency = 12, start = c(1956), end = c(1988))

# predictions to be made for K+1 using holtwinters
# first range of alpha beta = 0.2,0.2, gamma = 0.1

x_fit<-HoltWinters(x_train,alpha = 0.2, beta = 0.2, gamma = 0.1,seasonal="additive")

#plot of forecast versus actual time series
```

```
plot(forecast(x_fit,h=12),type="l",col="orange")
lines(ts (input_data, frequency = 12, start = c(1956), end = c(k+1)),col="red")
```

Forecasts from HoltWinters