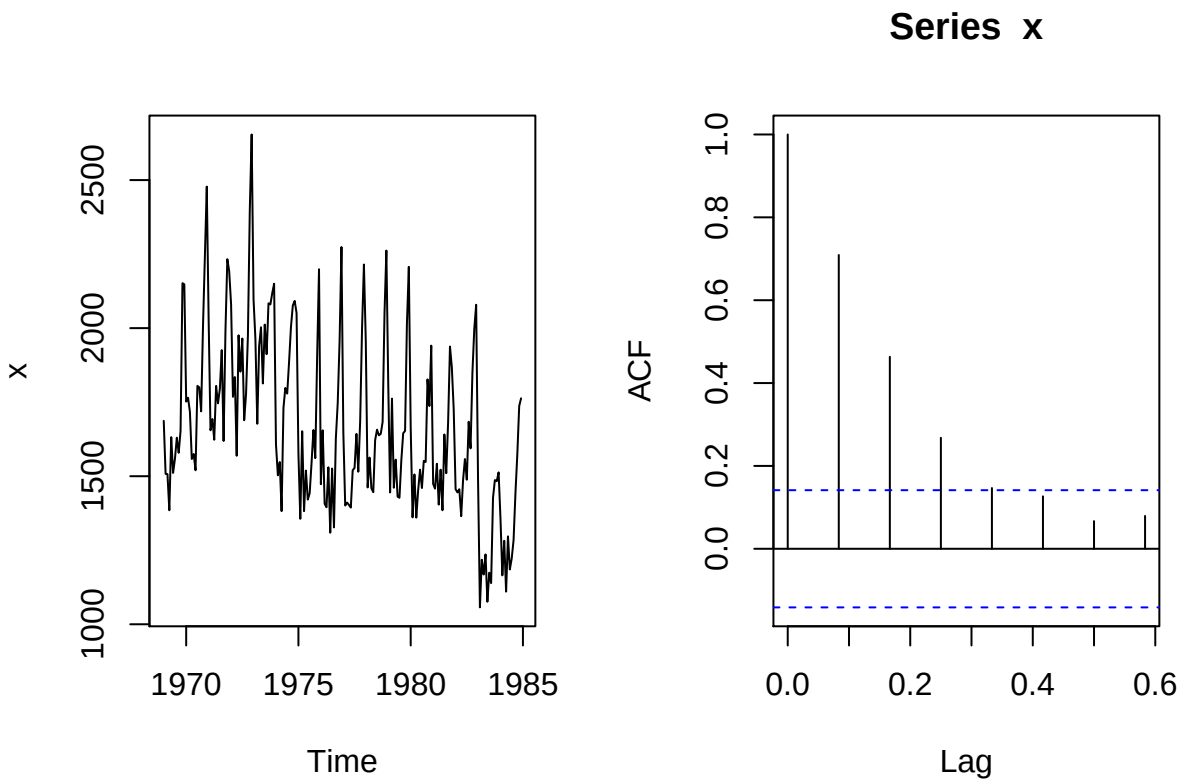
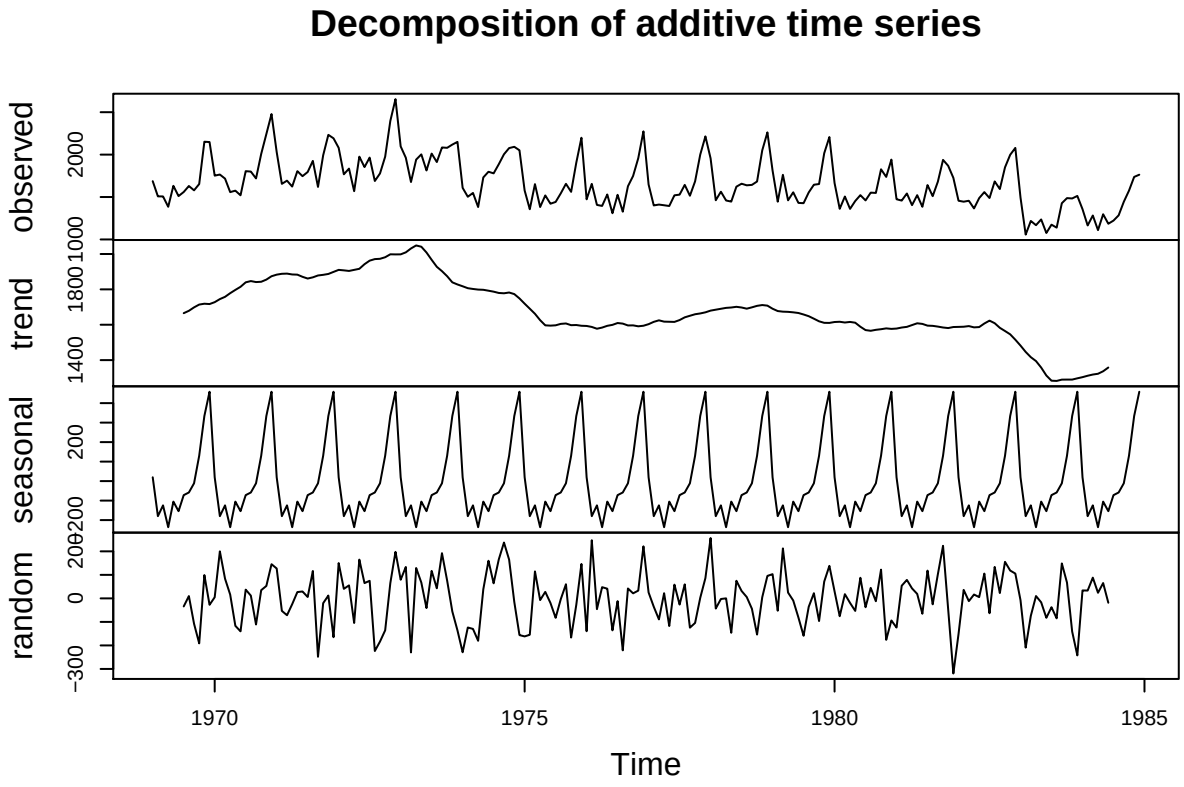
Auto correlation Seatbelt Data

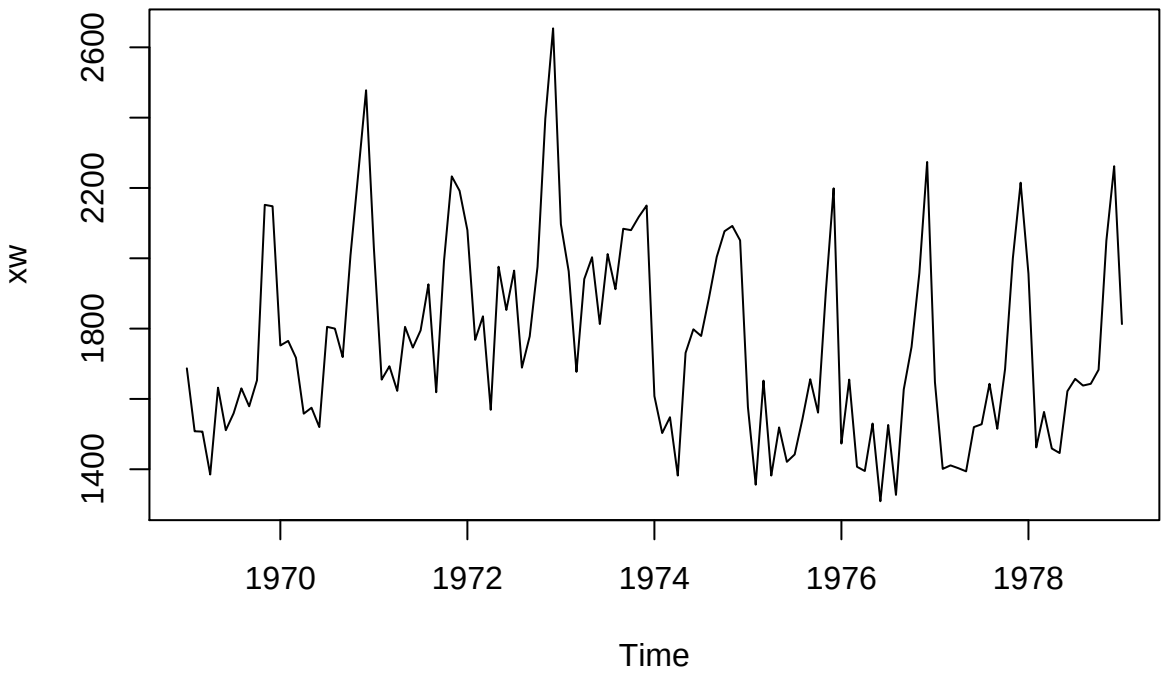
```
par(mfrow=c(1,2))
x<-Seatbelts[,"drivers"]
plot(x)
acf(x,lag.max = 7,plot = TRUE)
```




```
decomposedRes <- decompose(x, type="add")
plot(decomposedRes)
```




```
xw<-ts (x, frequency = 12, start = c(1969),end=c(1979))
plot(xw)
```




```
print(xw)
```

```
##       Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec
## 1969 1687 1508 1507 1385 1632 1511 1559 1630 1579 1653 2152 2148
## 1970 1752 1765 1717 1558 1575 1520 1805 1800 1719 2008 2242 2478
## 1971 2030 1655 1693 1623 1805 1746 1795 1926 1619 1992 2233 2192
## 1972 2080 1768 1835 1569 1976 1853 1965 1689 1778 1976 2397 2654
## 1973 2097 1963 1677 1941 2003 1813 2012 1912 2084 2080 2118 2150
## 1974 1608 1503 1548 1382 1731 1798 1779 1887 2004 2077 2092 2051
## 1975 1577 1356 1652 1382 1519 1421 1442 1543 1656 1561 1905 2199
## 1976 1473 1655 1407 1395 1530 1309 1526 1327 1627 1748 1958 2274
## 1977 1648 1401 1411 1403 1394 1520 1528 1643 1515 1685 2000 2215
## 1978 1956 1462 1563 1459 1446 1622 1657 1638 1643 1683 2050 2262
## 1979 1813
```

```
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
```

```
forecastPeriodLen = 12
lowest_ME <- 0.0
lowest_aplha = 0

for ( i in seq(0.0001,0.1,length.out = 100)){
  model <- hw(xw, initial = 'optimal', h=(forecastPeriodLen), gamma=NULL,alpha = i)
  acc_model <- accuracy(model)

  if(lowest_ME > acc_model[,"ME"] ){
    lowest_ME = acc_model[,"ME"]
    lowest_alpha =i
  }

}

print(lowest_alpha)
```

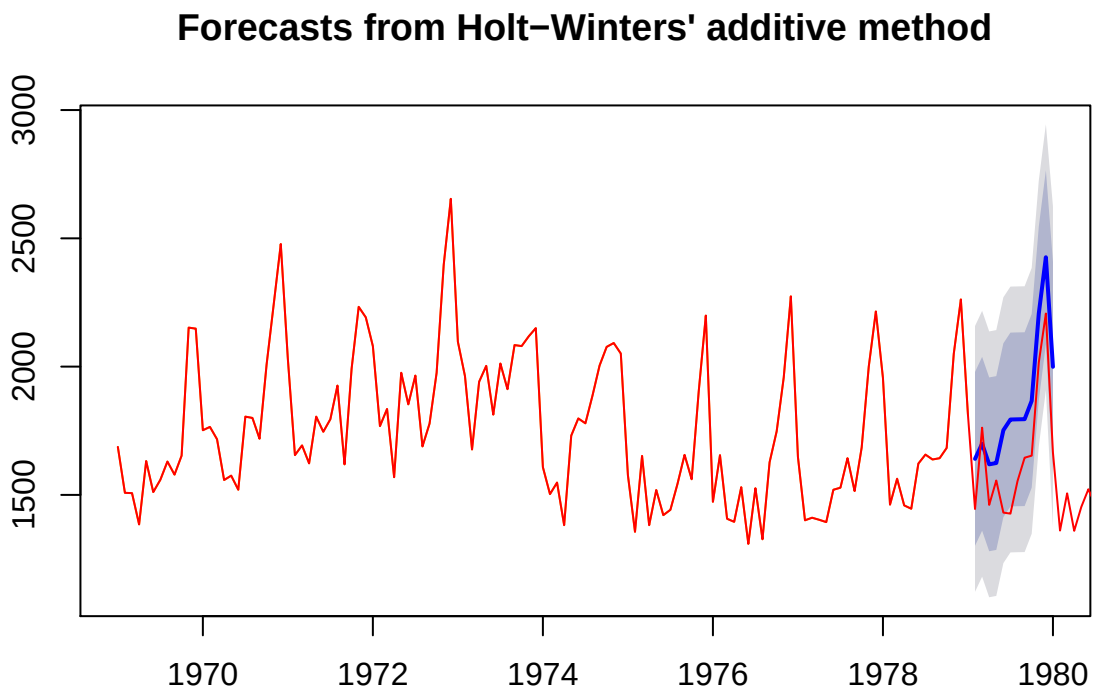
```
## [1] 1e-04
```

```
print(lowest_ME)
```

```
## [1] -170.6363
```

```
model <- hw(xw, initial = 'optimal', h=(forecastPeriodLen), gamma=NULL,alpha = lowest_alpha)

#plot(model)
plot(model,type="l",col="orange")
lines(x,col="red")
```




```
#accuracy(model) # calculate accuracy measures
```