pstat274_lab04_aoxu

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```
wine.csv = read.table("monthly-australian-wine-sales-th.csv",
sep=",", header=FALSE, skip=1, nrows=187)
```

```
head(wine.csv)
```

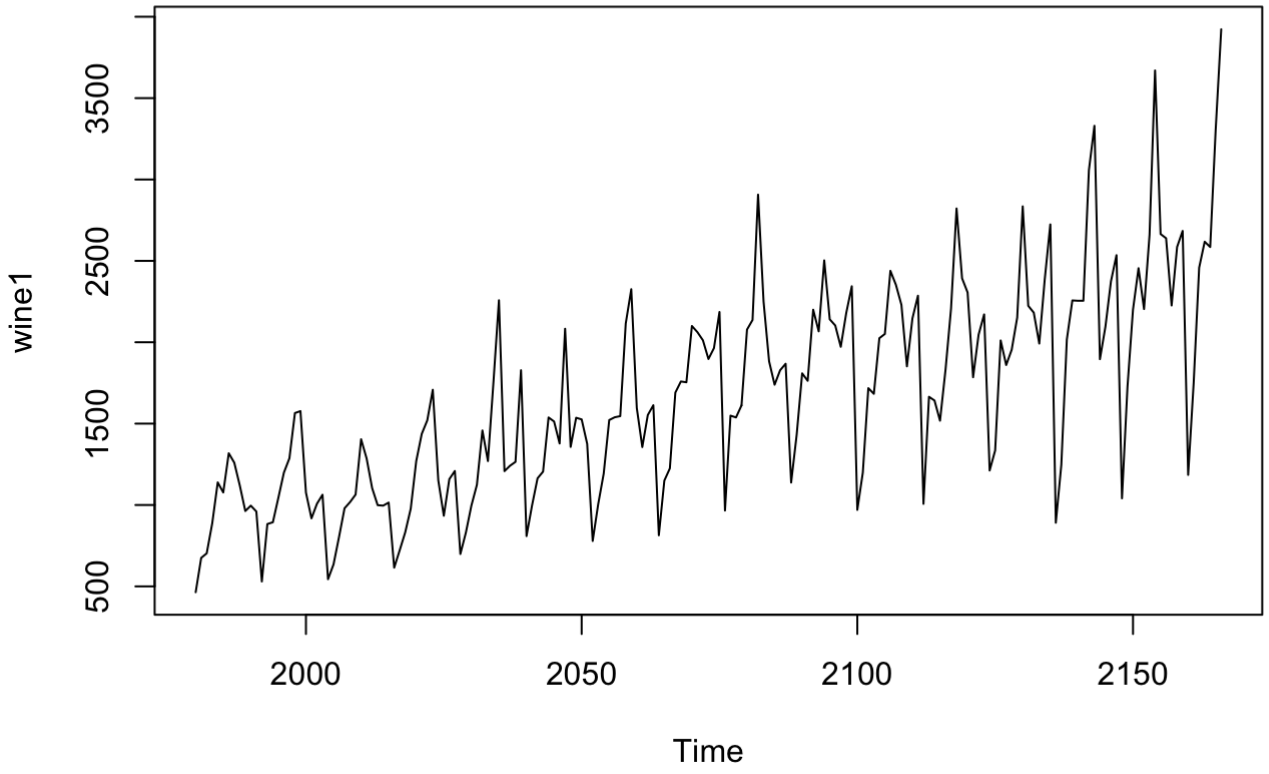
```
##        V1   V2
## 1 1980-01  464
## 2 1980-02  675
## 3 1980-03  703
## 4 1980-04  887
## 5 1980-05 1139
## 6 1980-06 1077
```

Problem 1

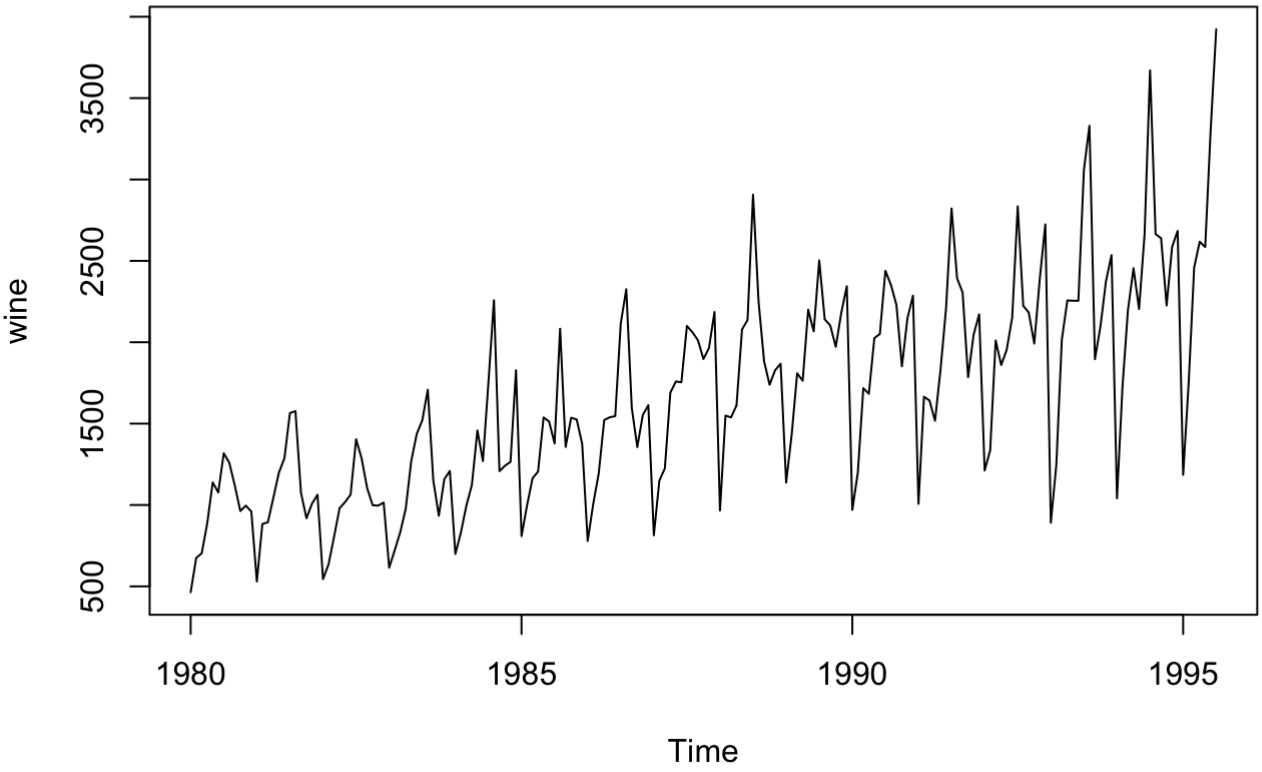
1.

```
wine1 = ts(wine.csv[,2], start = c(1980,1))
wine = ts(wine.csv[,2], start = c(1980,1), frequency = 12)
```

```
ts.plot(wine1)
```




```
ts.plot(wine)
```



It's easier to see the seasonal trend by using frequency=12 since the year gap in the time line is 5 years per block.

2. frequency = 365 since it's daily data.

2.

```
#install.packages("devtools")
#install.packages("forecast")
#devtools::install_github("FinYang/tsdl")
library(tsdl)
library(forecast)
```

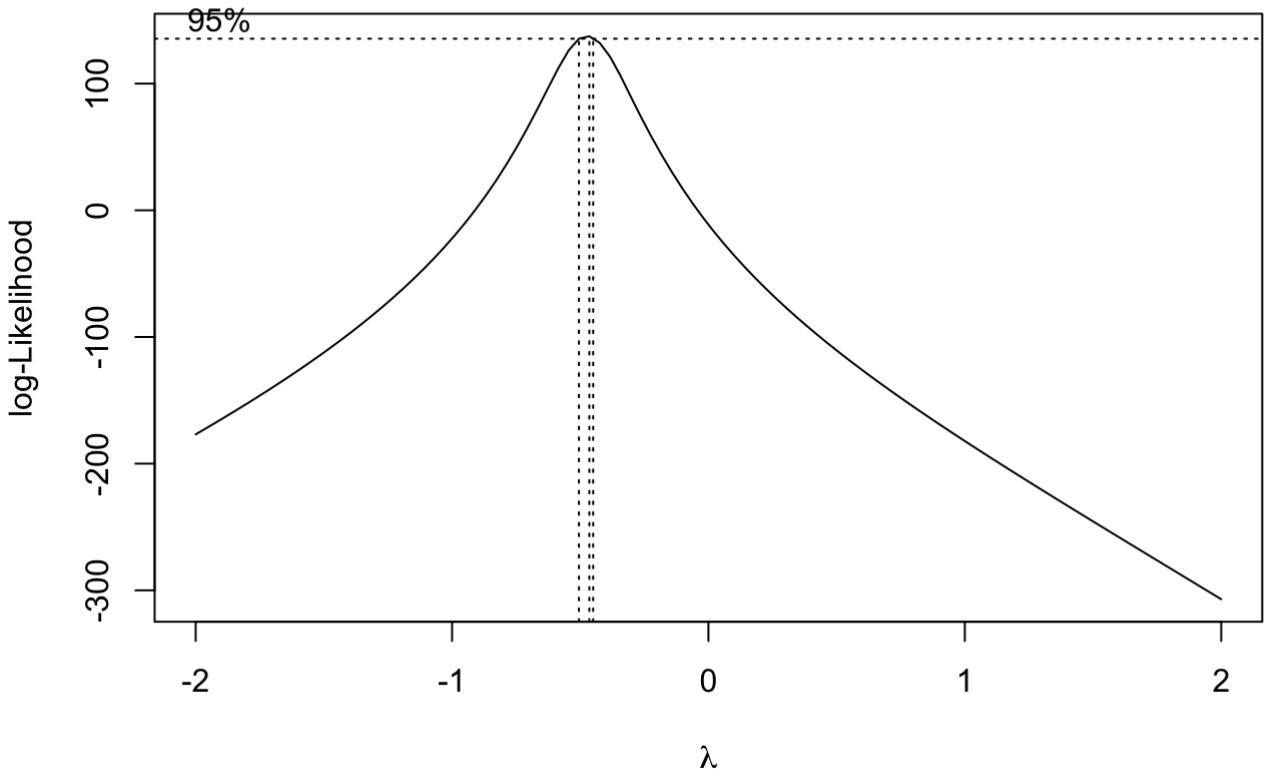
```
## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo
```

```
meta_tsdl$description[[1]]
```

```
## [1] "Quarterly Iowa nonfarm income (1948 – 1979)"
```

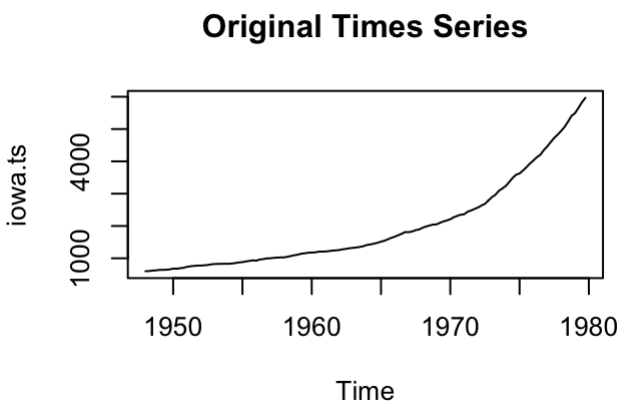
```
iowa.ts <- tsdl[[1]]
```

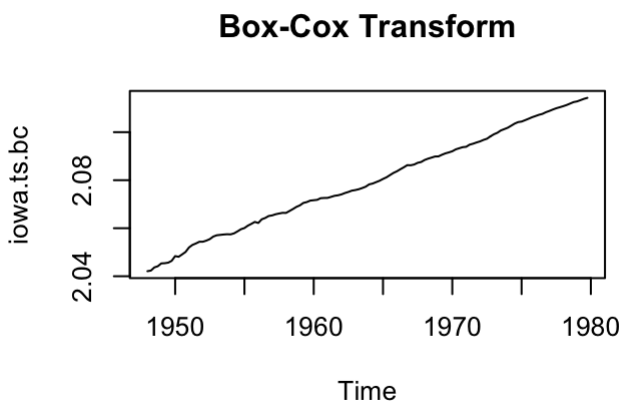
```
# Box-Cox Tranformation
library(MASS)
t = 1:length(iowa.ts)
fit = lm(iowa.ts ~ t)
bcTransform = boxcox(iowa.ts ~ t,plotit = TRUE)
```

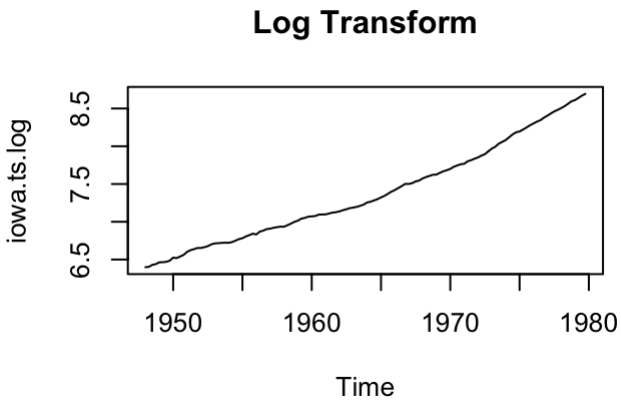


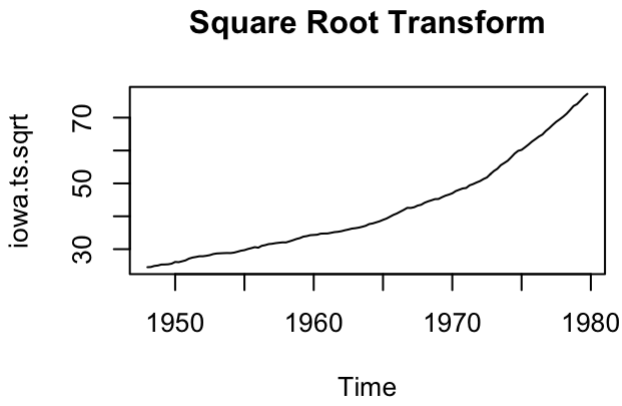

```
lambda = bcTransform$x[which(bcTransform$y == max(bcTransform$y))]
iowa.ts.bc = (1/lambda)*(iowa.ts^lambda-1)
```

```
#log transform
iowa.ts.log = log(iowa.ts)
# square root transform
iowa.ts.sqrt = sqrt(iowa.ts)
#Compare transforms
op= par(mfrow=c(2,2))
ts.plot(iowa.ts, main = "Original Times Series")
ts.plot(iowa.ts.bc, main = "Box-Cox Transform")
ts.plot(iowa.ts.log, main = "Log Transform")
ts.plot(iowa.ts.sqrt, main = "Square Root Transform")
```


Original Times Series
iowa.ts
1000
4000
1950
1960
1970
1980
Time


Box-Cox Transform
iowa.ts.bc
2.04
2.08
1950
1960
1970
1980
Time


Log Transform
iowa.ts.log
6.5
7.5
8.5
1950
1960
1970
1980
Time


Square Root Transform
iowa.ts.sqrt
30
50
70
1950
1960
1970
1980
Time