

pstat274_lab04_aoxu

AO XU

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

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

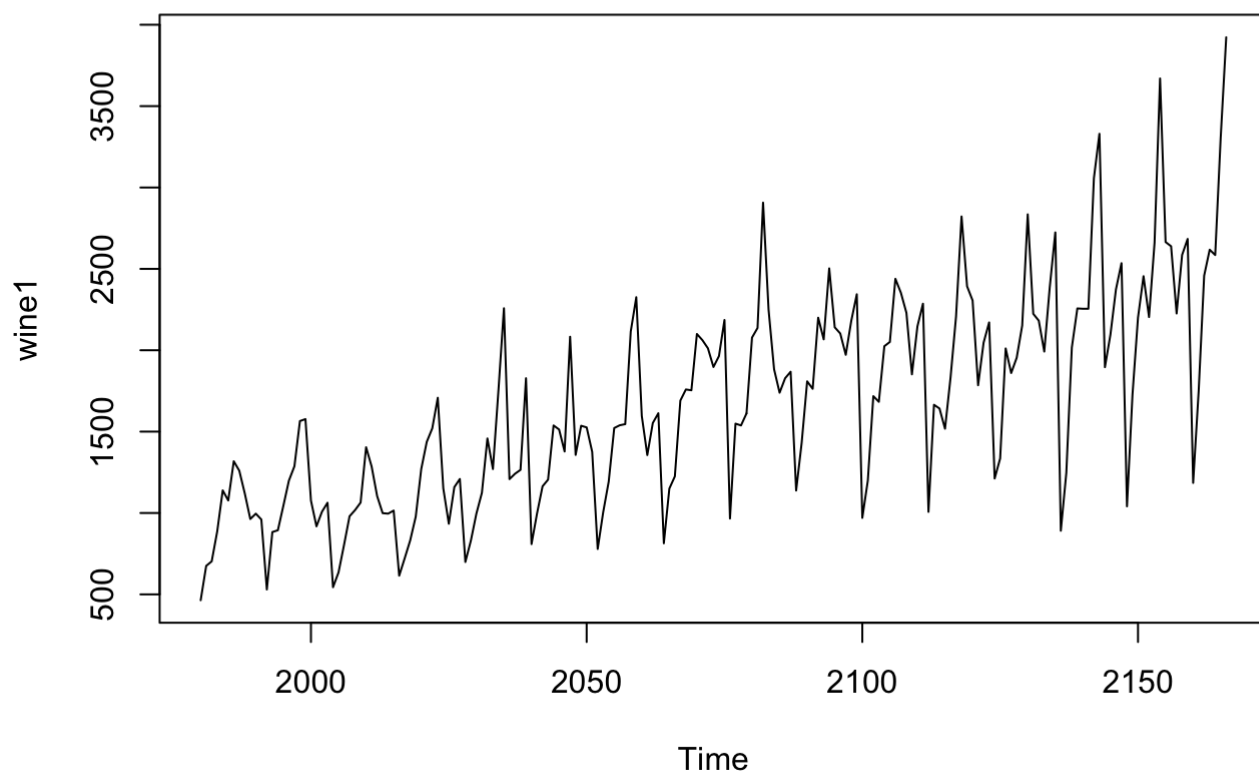
```
##          V1    V2  
## 1 1980-01  464  
## 2 1980-02  675  
## 3 1980-03  703  
## 4 1980-04  887  
## 5 1980-05 1139  
## 6 1980-06 1077
```

Problem 1

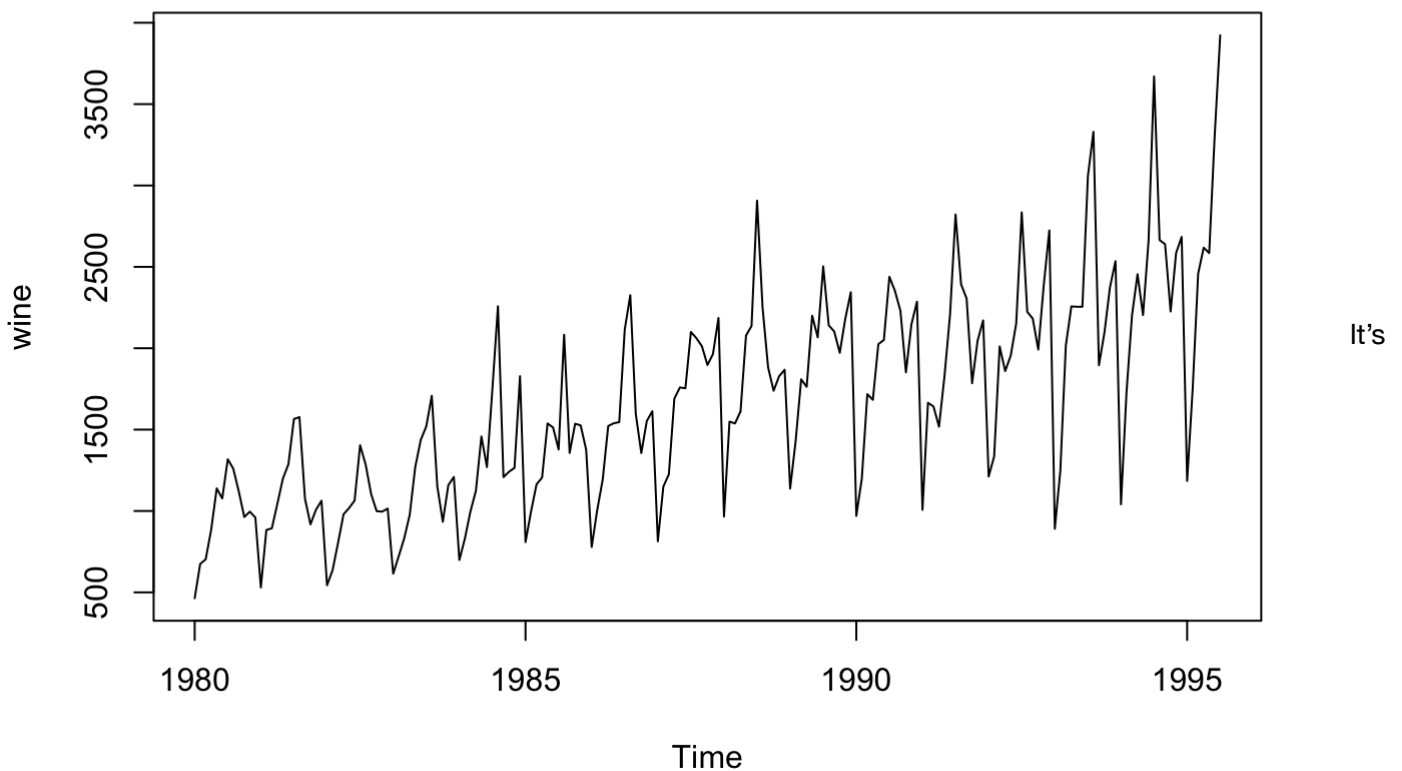
1.

```
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)
```



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)
```

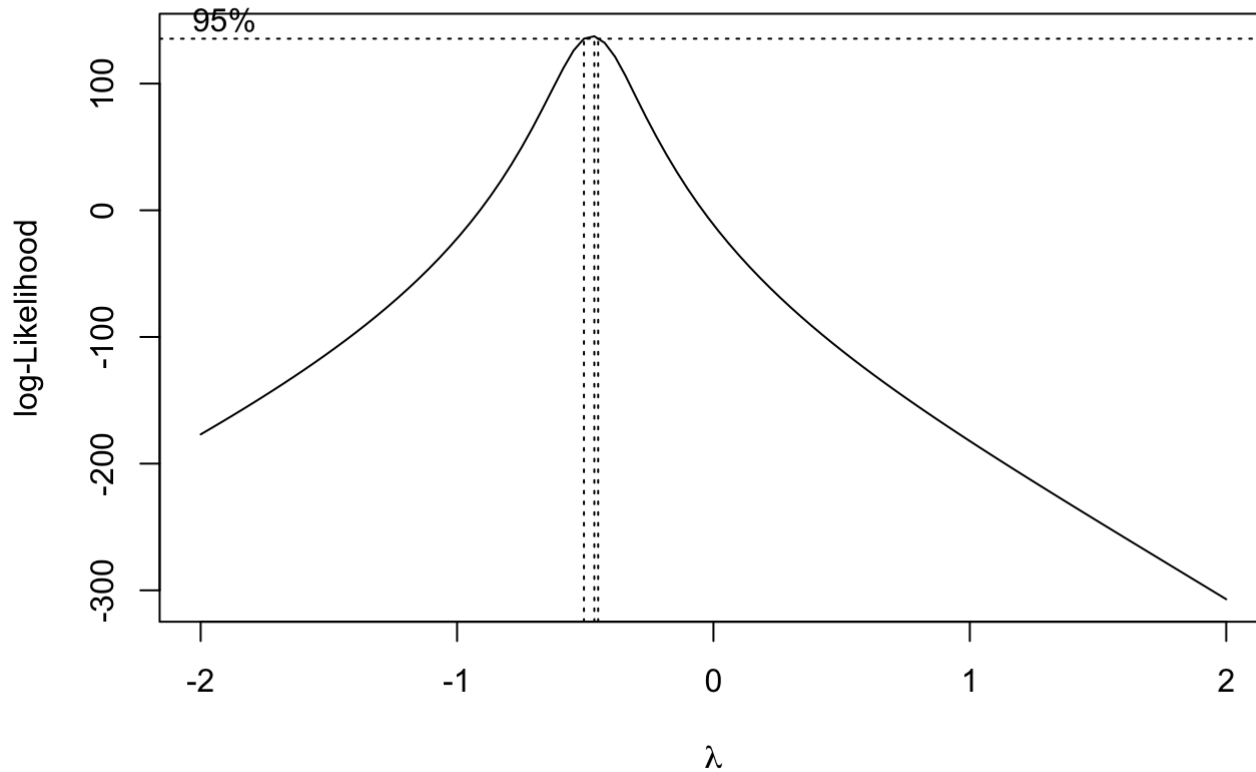
```
## Registered S3 method overwritten by 'quantmod':
##   method           from
##   as.zoo.data.frame zoo
```

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

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

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

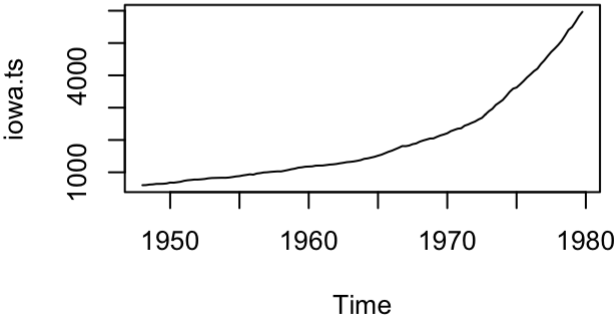
```
# Box-Cox Tranformation
library(MASS)
t = 1:length(iowa.ts)
fit = lm(iowa.ts ~ t)
bcTransform = boxcox(iowa.ts ~ t, plotit = TRUE)
```



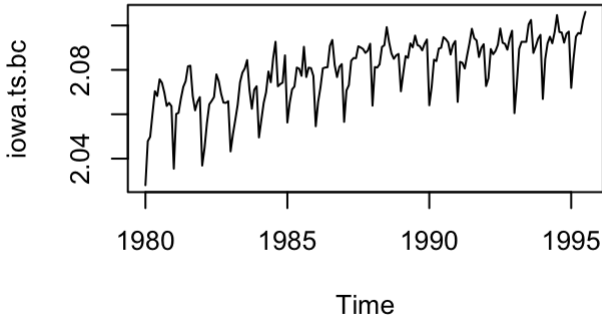
```
lambda = bcTransform$x[which(bcTransform$y == max(bcTransform$y))]
iowa.ts.bc = (1/lambda)*(wine^lambda-1)
```

```
#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")
```

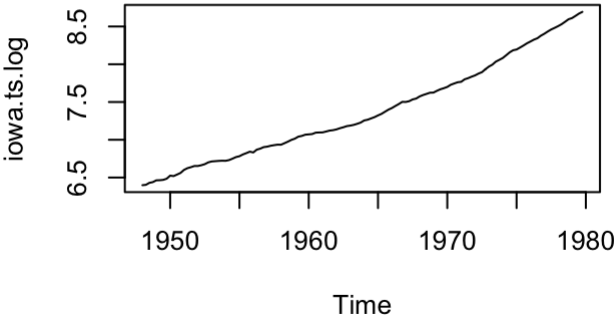
Original Times Series



Box-Cox Transform



Log Transform



Square Root Transform

