PSTAT174_Lab04

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1. Data Import

```
getwd()
```

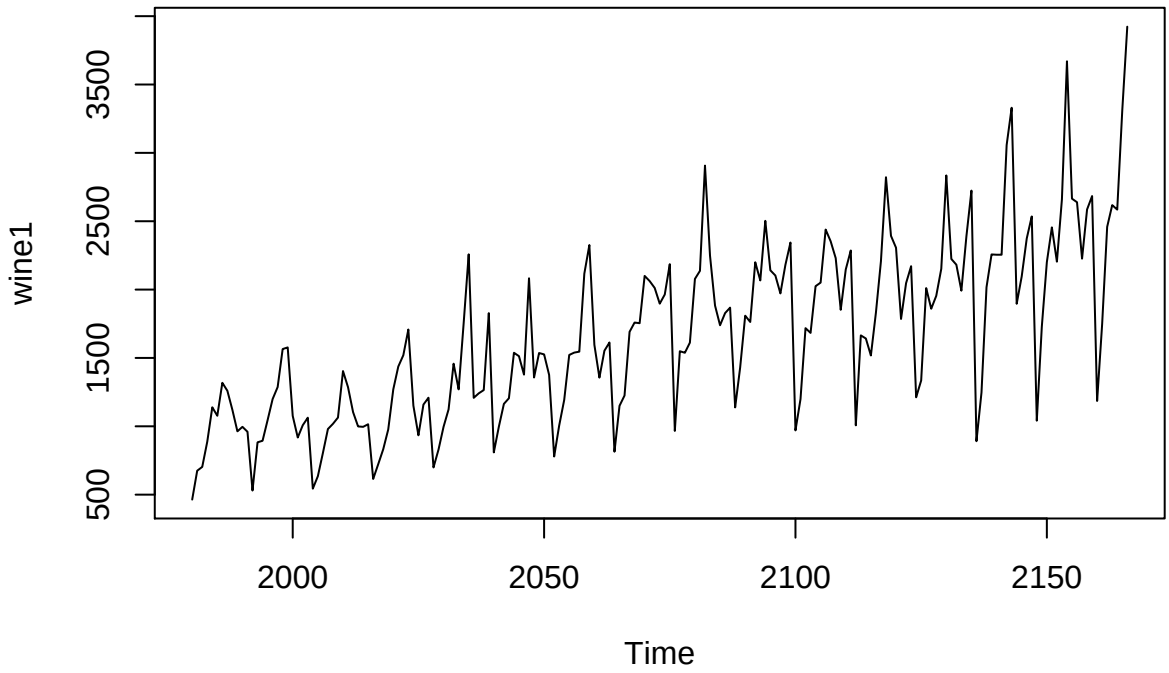
```
## [1] "/Users/celesteherrera/Documents/PSTAT174/Lab/Lab04"
```

```
setwd('/Users/celesteherrera/Documents/PSTAT174/Lab/Lab04')
wine_df <- read.table("aus-wine.csv", sep = ",", header = FALSE, skip = 1, nrows = 187)
```

```
wine <- ts(wine_df[,2], start = c(1980,1), frequency = 12)
wine
```

```
##       Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec
## 1980  464  675  703  887 1139 1077 1318 1260 1120  963  996  960
## 1981  530  883  894 1045 1199 1287 1565 1577 1076  918 1008 1063
## 1982  544  635  804  980 1018 1064 1404 1286 1104  999  996 1015
## 1983  615  722  832  977 1270 1437 1520 1708 1151  934 1159 1209
## 1984  699  830  996 1124 1458 1270 1753 2258 1208 1241 1265 1828
## 1985  809  997 1164 1205 1538 1513 1378 2083 1357 1536 1526 1376
## 1986  779 1005 1193 1522 1539 1546 2116 2326 1596 1356 1553 1613
## 1987  814 1150 1225 1691 1759 1754 2100 2062 2012 1897 1964 2186
## 1988  966 1549 1538 1612 2078 2137 2907 2249 1883 1739 1828 1868
## 1989 1138 1430 1809 1763 2200 2067 2503 2141 2103 1972 2181 2344
## 1990  970 1199 1718 1683 2025 2051 2439 2353 2230 1852 2147 2286
## 1991 1007 1665 1642 1518 1831 2207 2822 2393 2306 1785 2047 2171
## 1992 1212 1335 2011 1860 1954 2152 2835 2224 2182 1992 2389 2724
## 1993  891 1247 2017 2257 2255 2255 3057 3330 1896 2096 2374 2535
## 1994 1041 1728 2201 2455 2204 2660 3670 2665 2639 2226 2586 2684
## 1995 1185 1749 2459 2618 2585 3310 3923
```

```
wine1 <- ts(wine_df[,2], start = c(1980,1))
plot.ts(wine1)
```



1. We use frequency = 12" to tell R that the data is monthly standard starting for Janurary 1980.

2. The value we put inside frequency would be "frequency = 365" to show the correct year index for the daily data.

2. Data Tranformation

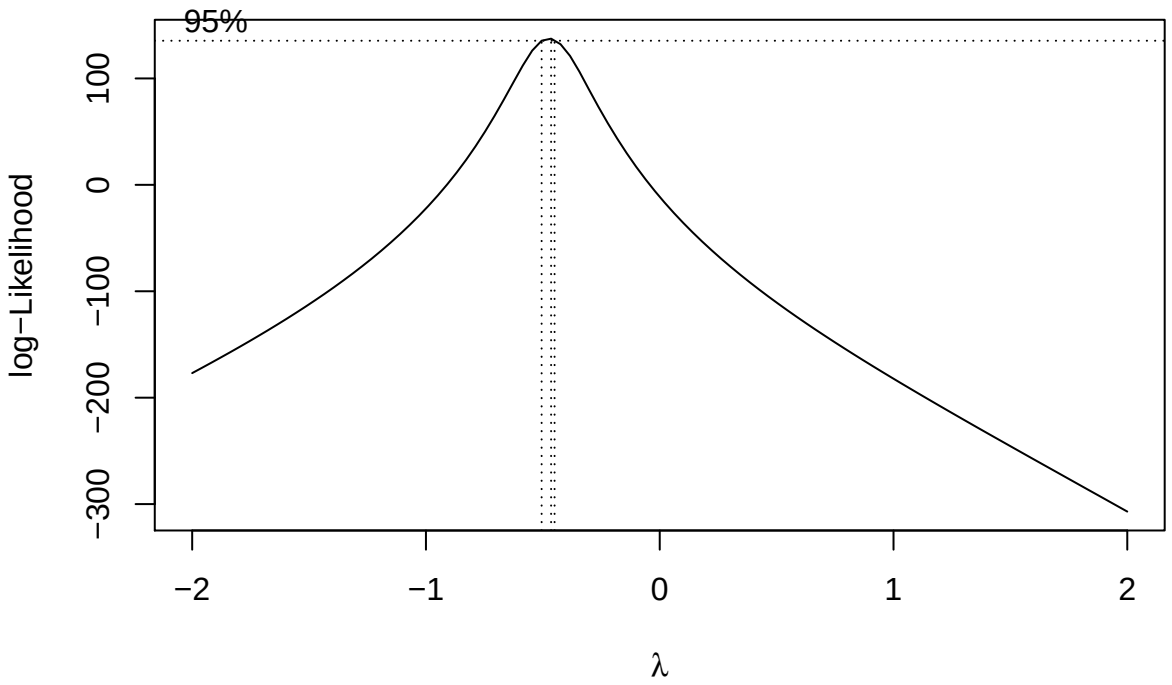
```
getwd()
```

```
## [1] "/Users/celesteherrera/Documents/PSTAT174/Lab/Lab04"
```

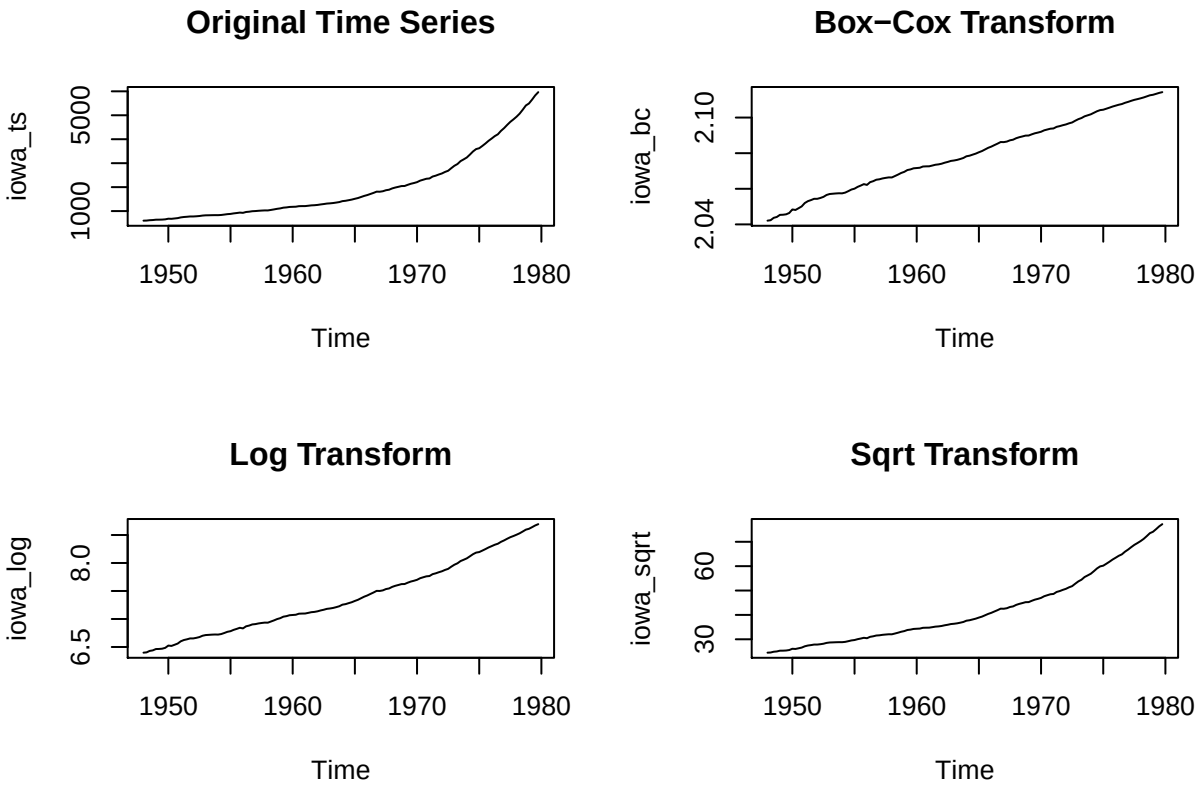
```
setwd("/Users/celesteherrera/Documents/PSTAT174/Lab/Lab04")
iowa_df <- read.csv("iowa.csv", header = TRUE, colClasses=c("NULL", NA))

iowa_ts <- ts(iowa_df[,1], start = c(1948,1), frequency = 4)
```

```
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_bc <- (1/lambda)*(iowa_ts^lambda-1)
iowa_log <- log(iowa_ts)
iowa_sqrt <- sqrt(iowa_ts)
par(mfrow=c(2,2))
ts.plot(iowa_ts, main = "Original Time Series")
ts.plot(iowa_bc, main = "Box-Cox Transform")
ts.plot(iowa_log, main = "Log Transform")
ts.plot(iowa_sqrt, main = "Sqrt Transform")
```


Original Time Series
iowa_ts
1000
5000
1950
1960
1970
1980
Time
Box−Cox Transform
iowa_bc
2.04
2.10
1950
1960
1970
1980
Time
Log Transform
iowa_log
6.5
8.0
1950
1960
1970
1980
Time
Sqrt Transform
iowa_sqrt
30
60
1950
1960
1970
1980
Time