Data_Main_Characteristics_Decompose_ACF_PACF

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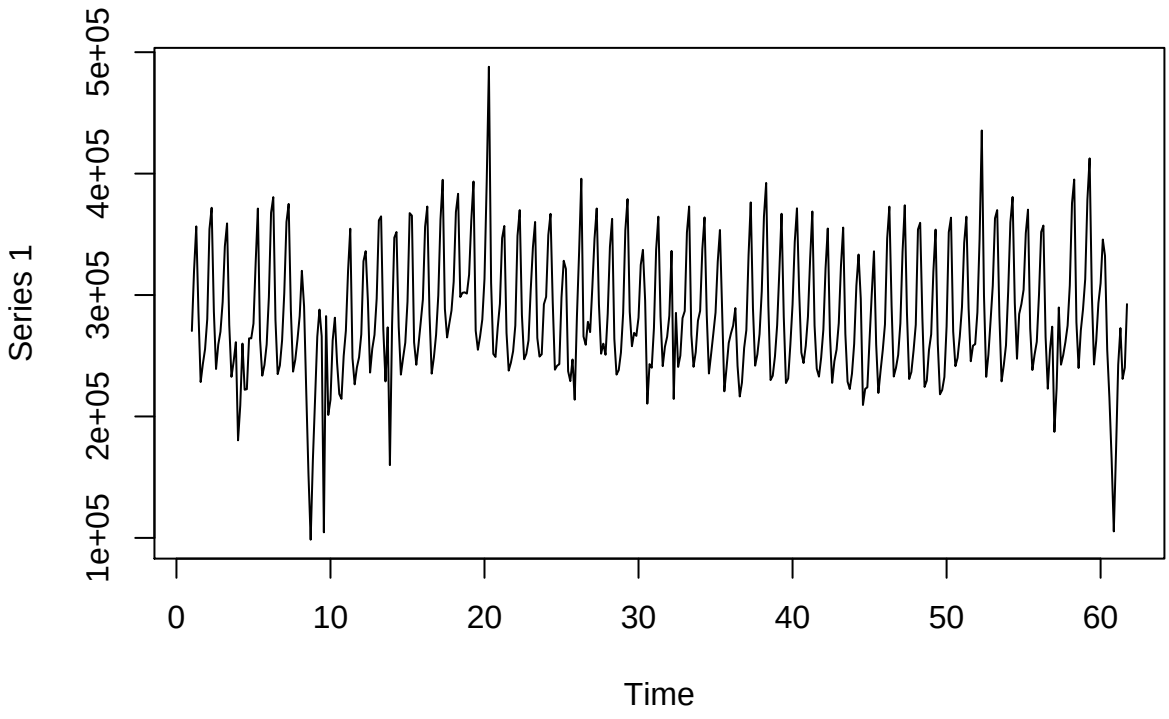
Import Data

```
dataPath<- "/Users/amilyhuang/Google Drive (yunh@uchicago.edu)/04-Uchicago/03-Fall_20/02-Time_Series/03
rs<- read.csv(file = paste(dataPath,"RidershipTS.csv", sep = "/"), header = TRUE )
```

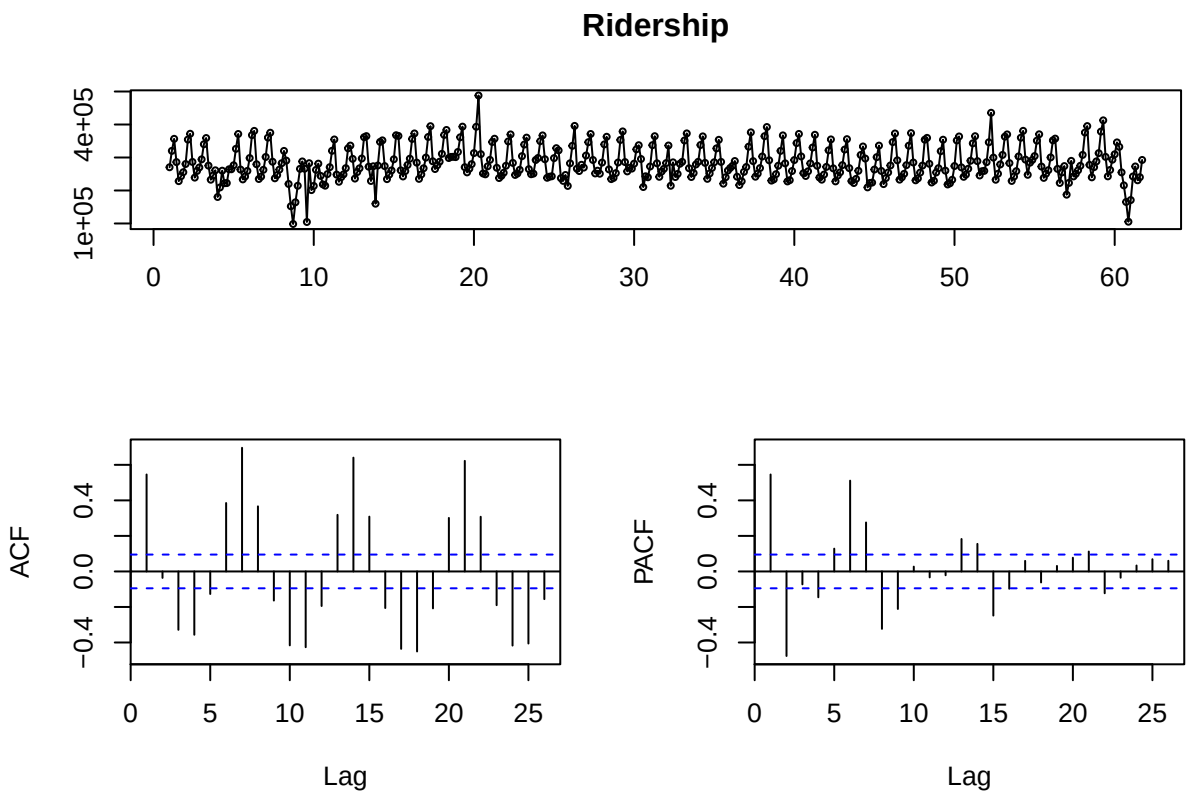
```
time_index <- seq(from = as.Date("2018-11-01"),
                  to = as.Date("2019-12-31"), by = "day")

rs_ts <- as.xts(rs[,2], order.by = time_index, frequency = 7)

Ridership <- ts(rs_ts, frequency=7)
```

Plot ACF and PACF

```
plot(Ridership)
```




```
tsdisplay(Ridership)
```

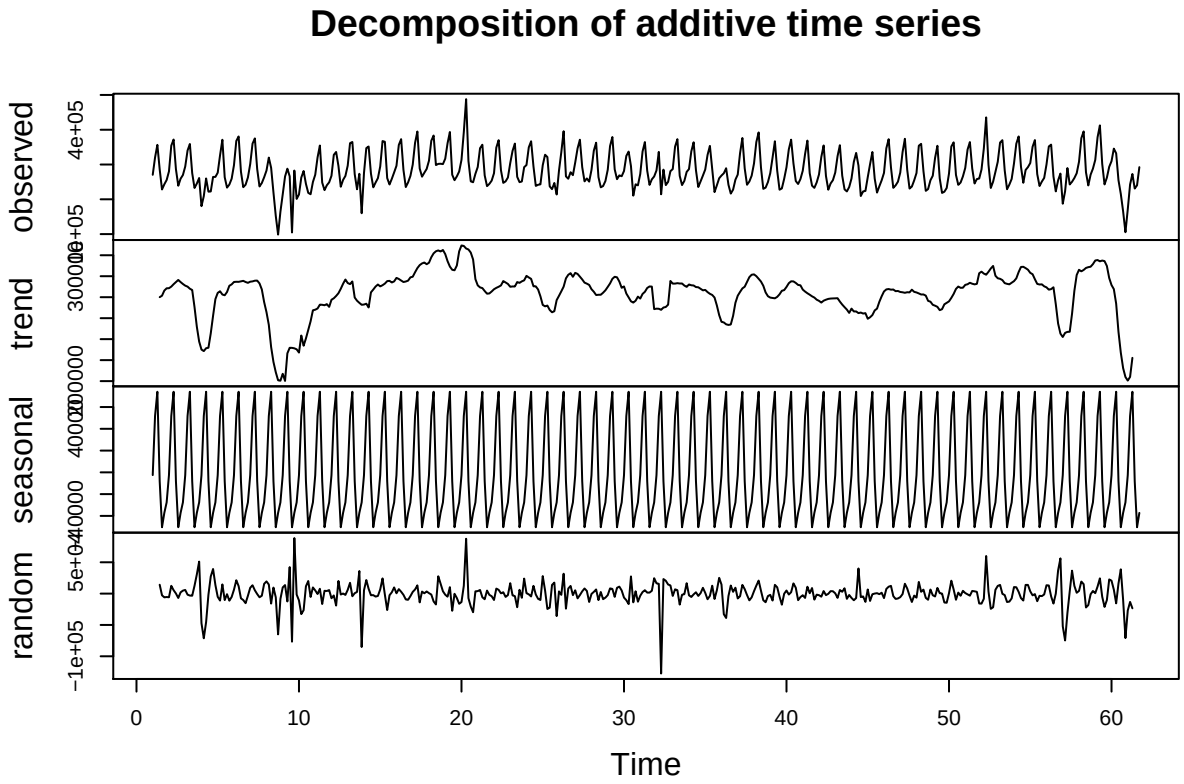



```
adf.test(Ridership, k=25)
```

```
##
##  Augmented Dickey-Fuller Test
##
## data:  Ridership
## Dickey-Fuller = -2.9795, Lag order = 25, p-value = 0.1636
## alternative hypothesis: stationary
```

Decompose Data

```
decp_add<- decompose(Ridership, type = "additive")
plot(decp_add)
```




```
Box.test(decp_add$random, lag = 25, type ="Ljung-Box")
```

```
##
##  Box-Ljung test
##
## data:  decp_add$random
## X-squared = 73.797, df = 25, p-value = 1.035e-06
```

```
#Not white noise
```

```
adf.test(decp_add$random[4:423]) #Stationary
```

```
## Warning in adf.test(decp_add$random[4:423]): p-value smaller than printed p-
## value
```

```
##
##  Augmented Dickey-Fuller Test
##
## data:  decp_add$random[4:423]
## Dickey-Fuller = -12.035, Lag order = 7, p-value = 0.01
## alternative hypothesis: stationary
```

```
kpss.test(decp_add$random[4:423]) #Stationary
```

```
## Warning in kpss.test(decp_add$random[4:423]): p-value greater than printed p-
## value
```

```
##
##  KPSS Test for Level Stationarity
##
## data:  decp_add$random[4:423]
## KPSS Level = 0.03419, Truncation lag parameter = 5, p-value = 0.1
```

```
tsdisplay(decp_add$random)
```