

TSA Competition

2024-03-27

Loading packages

```
library(lubridate)
```

```
##  
## Attaching package: 'lubridate'  
  
## The following objects are masked from 'package:base':  
##  
##     date, intersect, setdiff, union
```

```
library(ggplot2)  
library(forecast)
```

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

```
library(Kendall)  
library(tseries)  
library(outliers)  
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --  
## v dplyr   1.1.4     v stringr 1.5.1  
## v forcats 1.0.0     v tibble  3.2.1  
## v purrr   1.0.2     v tidyr   1.3.1  
## v readr   2.1.5
```

```
## -- Conflicts ----- tidyverse_conflicts() --  
## x dplyr::filter() masks stats::filter()  
## x dplyr::lag()     masks stats::lag()  
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(cowplot)
```

```
##  
## Attaching package: 'cowplot'  
##  
## The following object is masked from 'package:lubridate':  
##  
##     stamp
```

```
library(sarima)
```

```
## Loading required package: stats4
##
## Attaching package: 'sarima'
##
## The following object is masked from 'package:stats':
##
##      spectrum
```

```
library(readxl)
```

```
#Importing data and wrangling
```

```
#Importing data
```

```
data <- read_excel("./Data/load.xlsx")
```

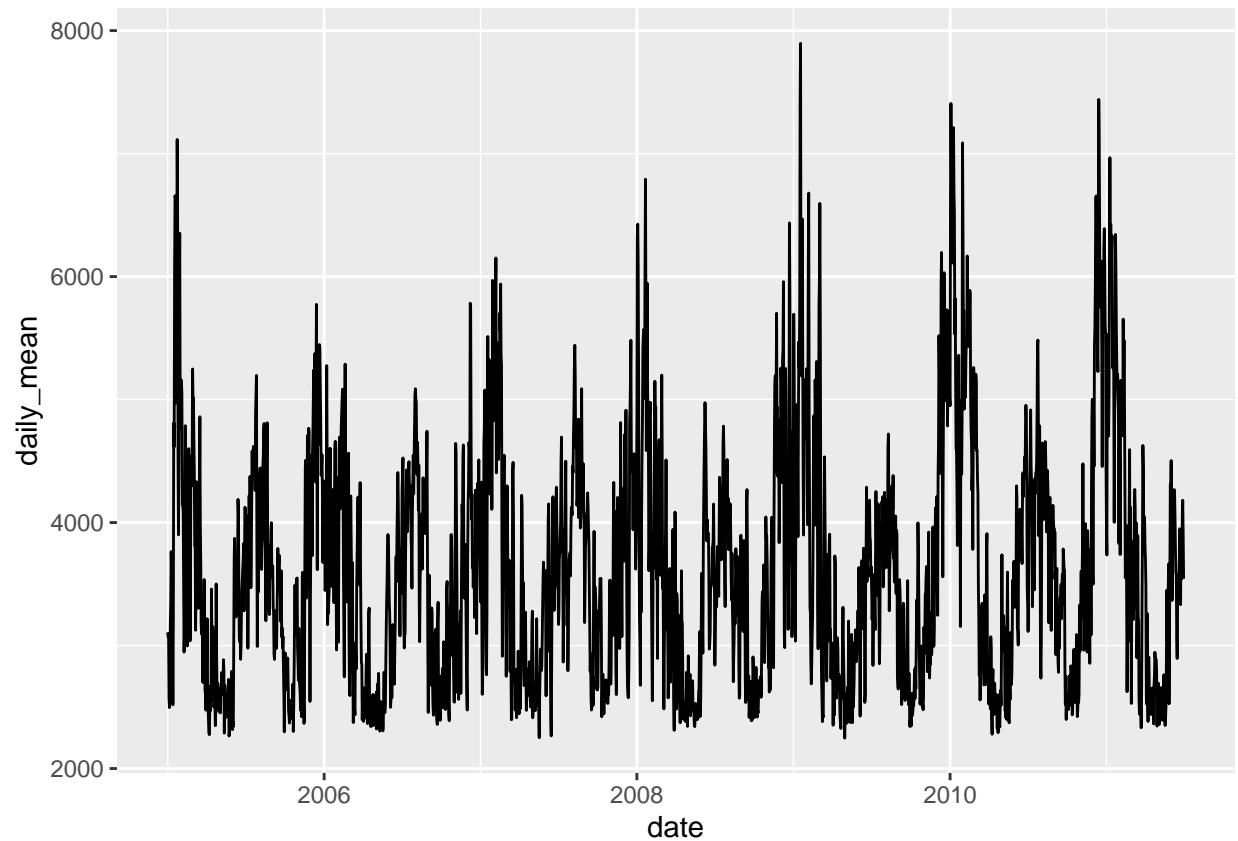
```
df_load_data<-data[,3:26]
```

```
df_load_processed<-df_load_data %>%  
  mutate(daily_mean=rowMeans(df_load_data, na.rm = TRUE))
```

```
data_final <- cbind(data[,2],df_load_processed[,25])
```

```
#Showing initial plot
```

```
ggplot(data_final,aes(x = date, y = daily_mean)) +  
  geom_line()
```



```
#Converting to time series
```

```
mts_data <- msts(data_final[,2],seasonal.periods = c(7,365), start = c(2005, 01, 01), end=c(2011,05,31),
head(mts_data)
```

```
## Multi-Seasonal Time Series:
```

```
## Start: 2005 1
```

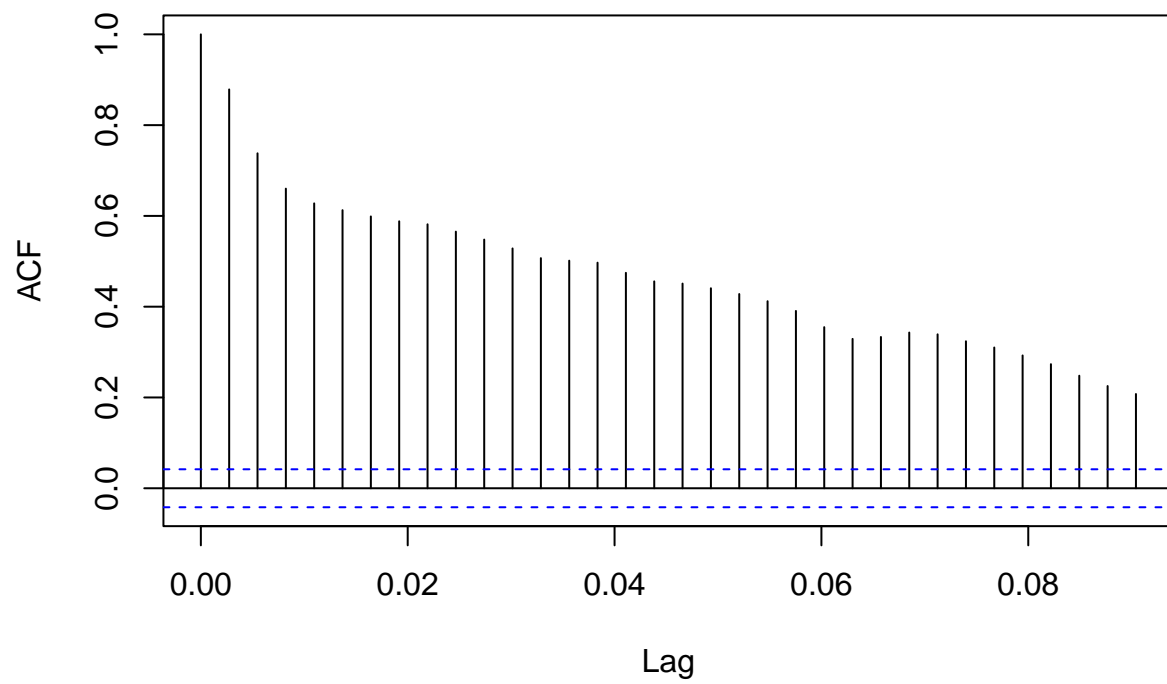
```
## Seasonal Periods: 7 365
```

```
## Data:
```

```
## [1] 3107.625 3068.292 3061.292 2565.708 2495.708 2734.917
```

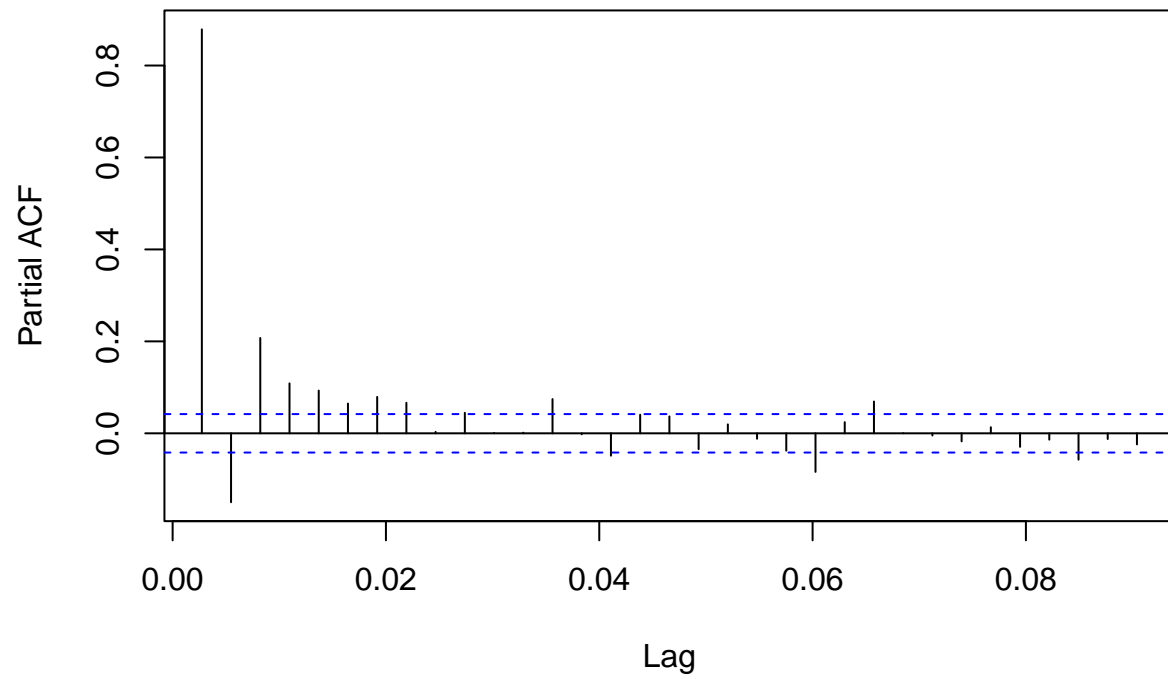
```
ACFplot <- acf(mts_data)
```

Series mts_data



```
PACFplot <- pacf(mts_data)
```

Series mts_data



```
ARIMA_Four_fit <- auto.arima(mts_data,  
                             seasonal=FALSE,  
                             lambda=0,  
                             xreg=fourier(mts_data,  
                                           K=c(2,12))  
                             )  
  
autoplot(ARIMA_Four_fit)
```

