web

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

```
## Warning: package 'forecast' was built under R version 4.1.2
```

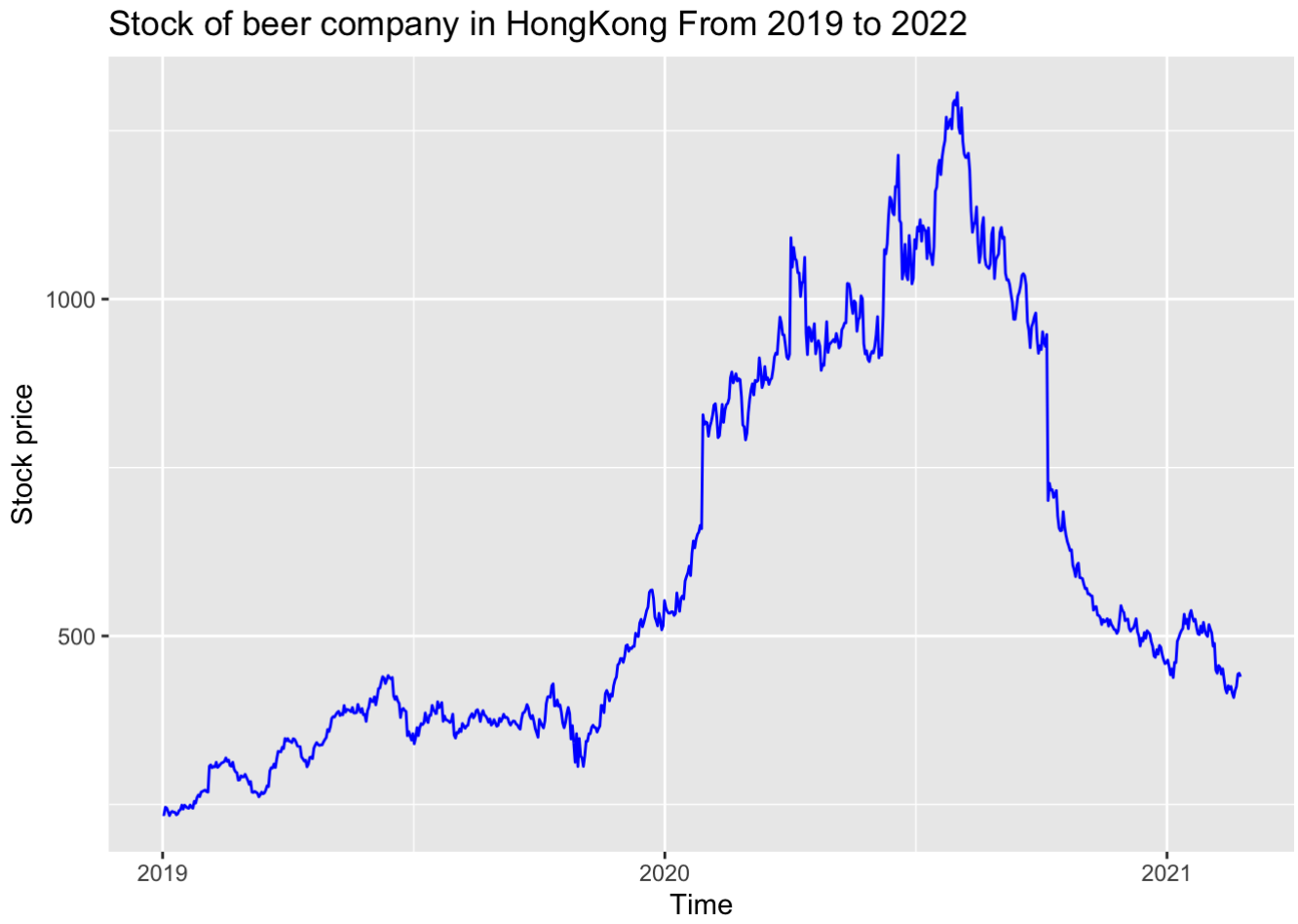
```
library(astsa)
library(xts)
library(tseries)
library(fpp2)
library(fma)
library(lubridate)
library(tidyverse)
library(TSstudio)
library(quantmod)
library(tidyquant)
library(plotly)
library(ggplot2)
```

```
bos = read.csv("B_beer.csv",header=TRUE)
head(bos)
```

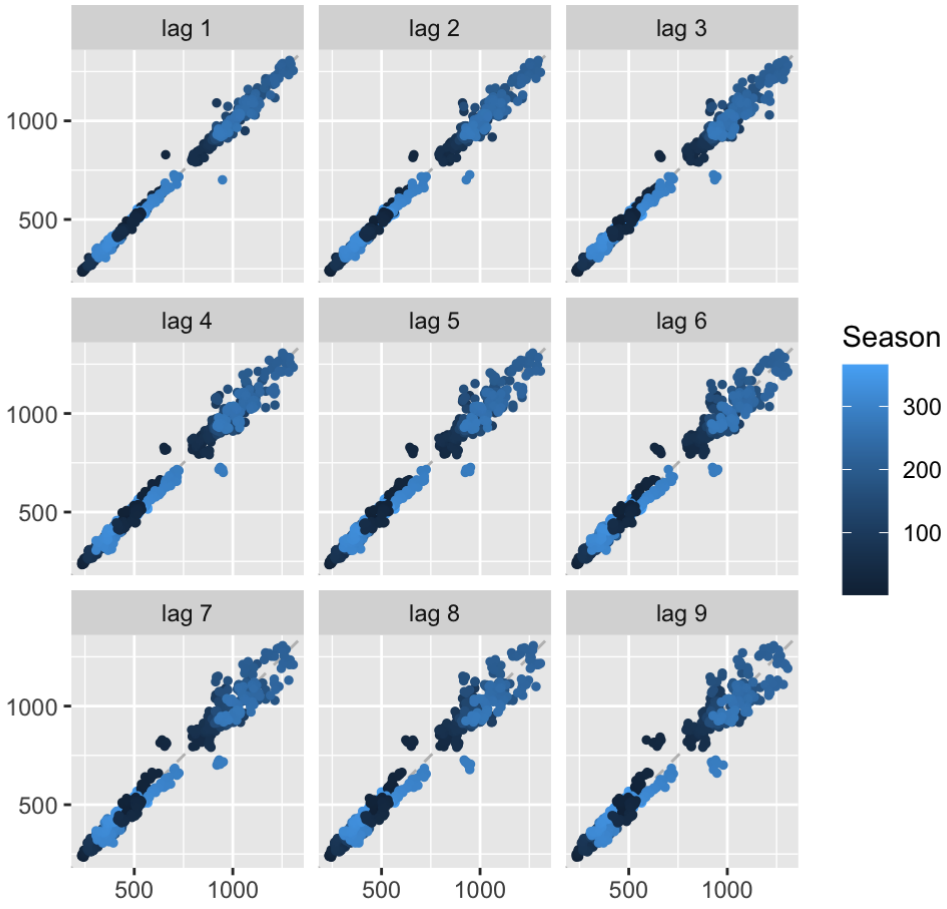
```
##         Date   High    Low   Open  Close Volume Adj.Close
## 1 2019-01-02 237.56 231.57 237.56 235.03 198400    235.03
## 2 2019-01-03 237.69 232.13 232.94 234.74 117000    234.74
## 3 2019-01-04 246.32 230.93 232.02 245.88 175800    245.88
## 4 2019-01-07 249.66 236.38 245.02 244.51 180500    244.51
## 5 2019-01-08 245.71 236.57 245.68 239.14 163200    239.14
## 6 2019-01-09 238.97 231.89 233.37 233.45 245400    233.45
```

```
bos$Date<-as.Date(bos$Date,"%Y-%m-%d")
```

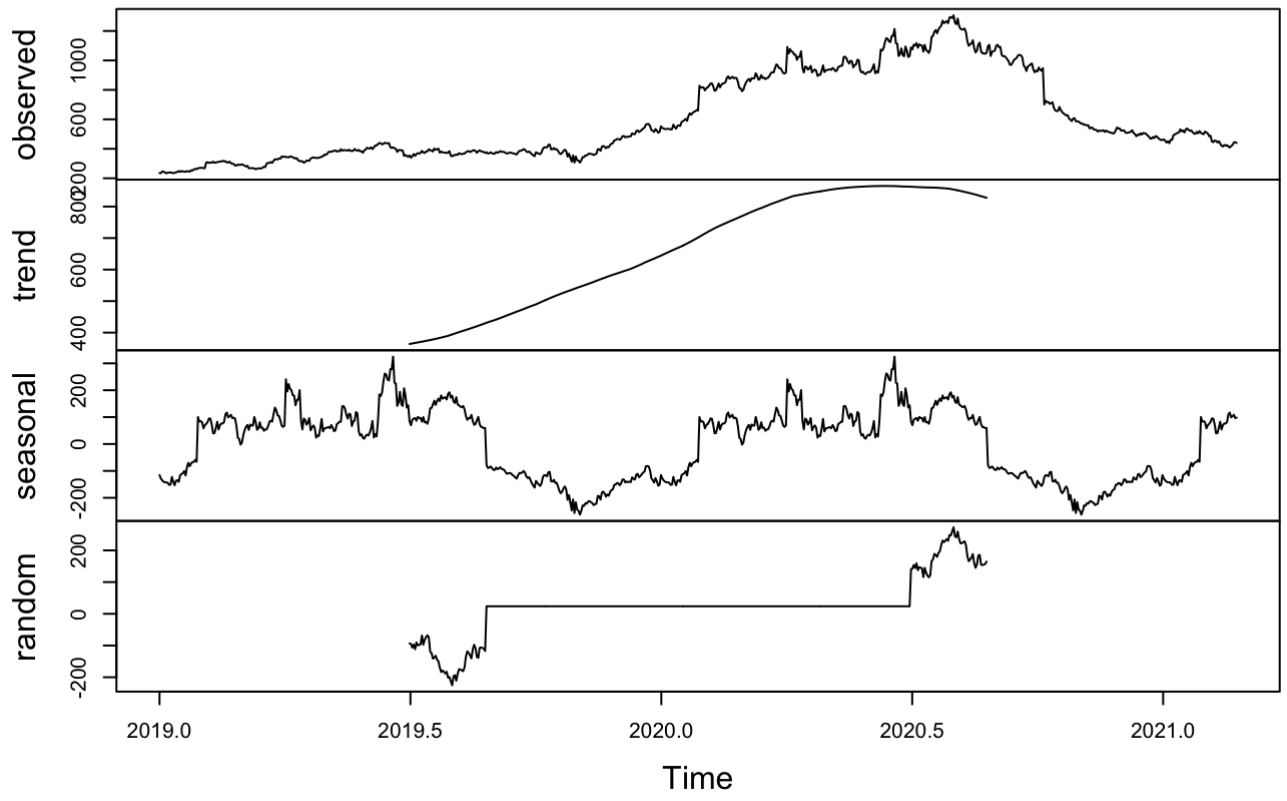
```
close=bos$Adj.Close
boston=ts(close, star=decimal_date(as.Date("2019-01-01")),frequency = 365.25)

autoplot(boston, colour = 'blue')+
  ggtitle("Stock of beer company in HongKong From 2019 to 2022")+
  ylab("Stock price")+
  theme(legend.position="none")
```




```
gglagplot(boston, do.lines=FALSE, lags=9)
```



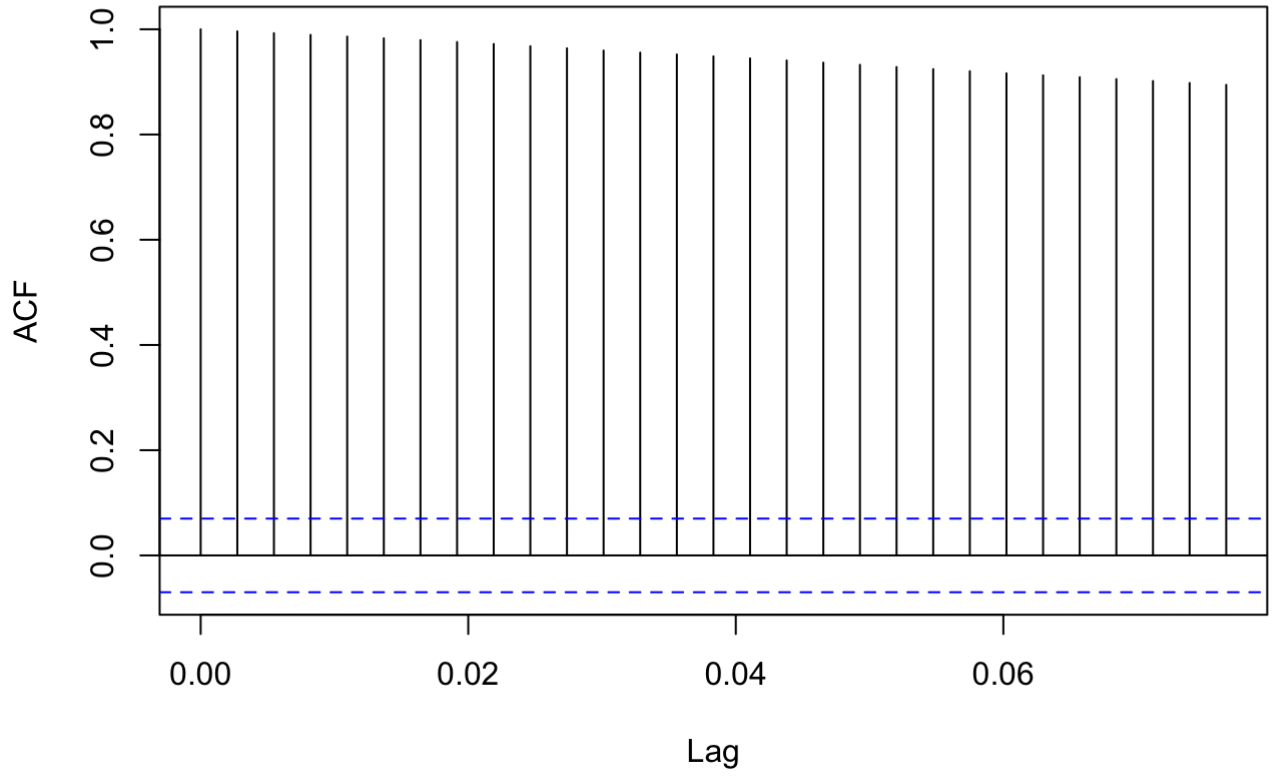

```
plot(decompose(boston))
```



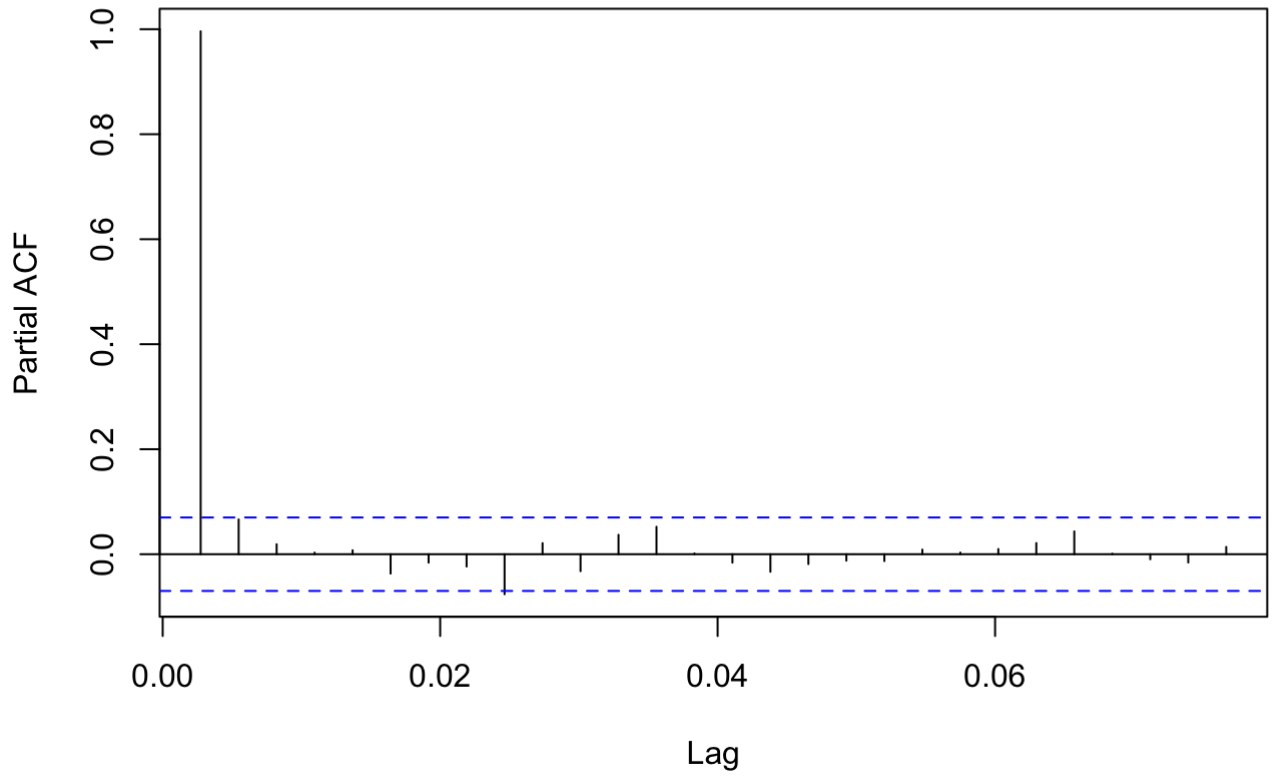

```
dev.off()
```

```
## null device
##           1
```

```
acf(boston)
```



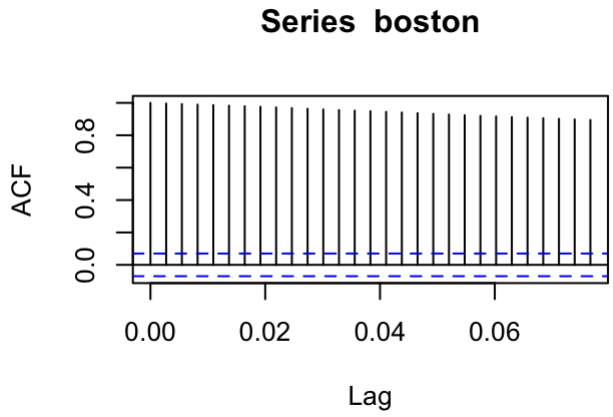

```
pacf(boston)
```

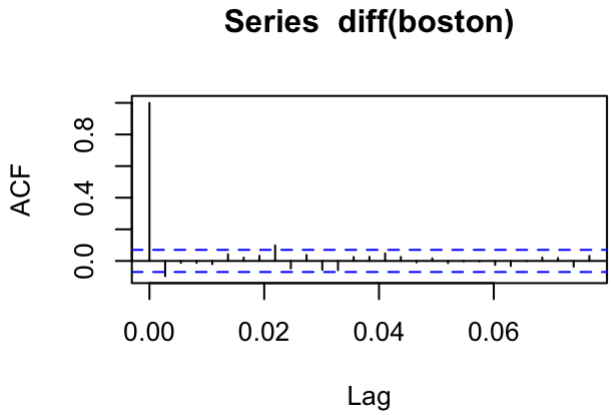


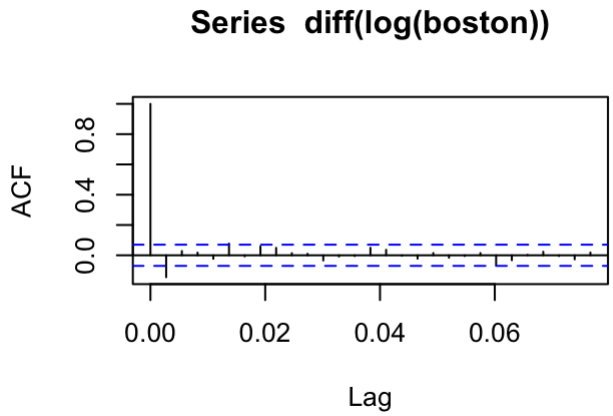

```
tseries::adf.test(boston)
```

```
##
##  Augmented Dickey-Fuller Test
##
## data:  boston
## Dickey-Fuller = -0.58743, Lag order = 9, p-value = 0.9778
## alternative hypothesis: stationary
```

```
par(mfrow=c(2,2))
acf(boston)
acf(diff(boston))
acf(diff(log(boston)))
```








```
tseries::adf.test(diff(log(boston)))
```

```
## Warning in tseries::adf.test(diff(log(boston))): p-value smaller than printed p-
## value
```

```
##
##  Augmented Dickey-Fuller Test
##
## data:  diff(log(boston))
## Dickey-Fuller = -7.6277, Lag order = 9, p-value = 0.01
## alternative hypothesis: stationary
```