Stock Exchange Analysics

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## R Markdown

### Importing Libraries.

library("quantmod")

## Warning: package 'quantmod' was built under R version 4.0.5

## Loading required package: xts

## Warning: package 'xts' was built under R version 4.0.5

## Loading required package: zoo

##   
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':  
##   
## as.Date, as.Date.numeric

## Loading required package: TTR

## Warning: package 'TTR' was built under R version 4.0.5

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

library("ggplot2")  
library("dplyr")

## Warning: package 'dplyr' was built under R version 4.0.5

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:xts':  
##   
## first, last

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

library(plotly)

## Warning: package 'plotly' was built under R version 4.0.5

##   
## Attaching package: 'plotly'

## The following object is masked from 'package:ggplot2':  
##   
## last\_plot

## The following object is masked from 'package:stats':  
##   
## filter

## The following object is masked from 'package:graphics':  
##   
## layout

### Loading Dataset

Data <- read.csv("indexProcessed.csv")  
summary(Data)

## Index Date Open High   
## Length:104224 Length:104224 Min. : 54.87 Min. : 54.87   
## Class :character Class :character 1st Qu.: 2046.89 1st Qu.: 2057.21   
## Mode :character Mode :character Median : 5772.14 Median : 5812.76   
## Mean : 8015.35 Mean : 8063.32   
## 3rd Qu.:10487.38 3rd Qu.:10552.18   
## Max. :68775.06 Max. :69403.75   
## Low Close Adj.Close Volume   
## Min. : 54.87 Min. : 54.87 Min. : 54.87 Min. :0.000e+00   
## 1st Qu.: 2037.19 1st Qu.: 2047.51 1st Qu.: 2047.36 1st Qu.:0.000e+00   
## Median : 5725.20 Median : 5773.71 Median : 5773.71 Median :9.529e+05   
## Mean : 7962.58 Mean : 8014.37 Mean : 8014.16 Mean :1.348e+09   
## 3rd Qu.:10416.09 3rd Qu.:10488.62 3rd Qu.:10488.62 3rd Qu.:2.065e+08   
## Max. :68516.99 Max. :68775.06 Max. :68775.06 Max. :9.440e+10   
## CloseUSD   
## Min. : 10.21   
## 1st Qu.: 320.46   
## Median : 1371.60   
## Mean : 3046.73   
## 3rd Qu.: 4383.05   
## Max. :18934.38

Data$Date <- unlist(Data$Date)  
Data$CloseUSD <- unlist(Data$CloseUSD)

### Mutating Dataset

# Adding column based on other column:  
Data<-Data %>%  
 mutate(Status = if\_else(Open<=Close,"True","False")  
 )  
Data<-Data %>%  
 mutate(Inc\_or\_Dec = (Close-Open)  
 )  
summary(Data)

## Index Date Open High   
## Length:104224 Length:104224 Min. : 54.87 Min. : 54.87   
## Class :character Class :character 1st Qu.: 2046.89 1st Qu.: 2057.21   
## Mode :character Mode :character Median : 5772.14 Median : 5812.76   
## Mean : 8015.35 Mean : 8063.32   
## 3rd Qu.:10487.38 3rd Qu.:10552.18   
## Max. :68775.06 Max. :69403.75   
## Low Close Adj.Close Volume   
## Min. : 54.87 Min. : 54.87 Min. : 54.87 Min. :0.000e+00   
## 1st Qu.: 2037.19 1st Qu.: 2047.51 1st Qu.: 2047.36 1st Qu.:0.000e+00   
## Median : 5725.20 Median : 5773.71 Median : 5773.71 Median :9.529e+05   
## Mean : 7962.58 Mean : 8014.37 Mean : 8014.16 Mean :1.348e+09   
## 3rd Qu.:10416.09 3rd Qu.:10488.62 3rd Qu.:10488.62 3rd Qu.:2.065e+08   
## Max. :68516.99 Max. :68775.06 Max. :68775.06 Max. :9.440e+10   
## CloseUSD Status Inc\_or\_Dec   
## Min. : 10.21 Length:104224 Min. :-4770.621   
## 1st Qu.: 320.46 Class :character 1st Qu.: -17.583   
## Median : 1371.60 Mode :character Median : 0.000   
## Mean : 3046.73 Mean : -0.987   
## 3rd Qu.: 4383.05 3rd Qu.: 19.310   
## Max. :18934.38 Max. : 2882.141

table(Data$Status)

##   
## False True   
## 40313 63911

### Analyzing Graphs for overall data, the questions and answers are in Report

ggplot(Data) + geom\_line(mapping = aes(x=Date, y=Volume, group=1), color='blue')

![](data:image/png;base64;base64,)

ggplot(Data) + geom\_histogram(mapping = aes(x=Volume,color=Status), fill='white')

## `stat\_bin()` using `bins = 30`. Pick better value with `binwidth`.

![](data:image/png;base64;base64,)

ggplot(data = Data) + geom\_point(mapping = aes(x = Date, y =CloseUSD,color=Index))

![](data:image/png;base64;base64,)

ggplot(data = Data) + geom\_point(mapping = aes(x = Date, y =Open))

![](data:image/png;base64;base64,)

### Getting Data for New York Stock Exchange from 2021 and analyzing it.

Data <- Data %>% filter(Index == 'NYA')  
Data$Date <- as.Date(Data$Date)  
Data <- Data %>% filter(Date > '2021-01-01')  
  
fig <- Data %>% plot\_ly(x = ~Date, type="candlestick",  
 open = Data$Open, close = Data$Close,  
 high = Data$High, low = Data$Low)   
fig <- fig %>% layout(title = "Basic Candlestick Chart",  
 xaxis = list(rangeslider = list(visible = F)))  
  
fig

Data <- Data[,c(2,3,4,5,6,8,7)]  
summary(Data)

## Date Open High Low   
## Min. :2021-01-04 Min. :14379 Min. :14579 Min. :14258   
## 1st Qu.:2021-02-09 1st Qu.:15078 1st Qu.:15232 1st Qu.:15015   
## Median :2021-03-17 Median :15557 Median :15650 Median :15475   
## Mean :2021-03-17 Mean :15584 Mean :15676 Mean :15502   
## 3rd Qu.:2021-04-22 3rd Qu.:16120 3rd Qu.:16234 3rd Qu.:16034   
## Max. :2021-05-28 Max. :16590 Max. :16686 Max. :16532   
## Close Volume Adj.Close   
## Min. :14377 Min. :2.947e+09 Min. :14377   
## 1st Qu.:15123 1st Qu.:4.017e+09 1st Qu.:15123   
## Median :15576 Median :4.568e+09 Median :15576   
## Mean :15602 Mean :4.736e+09 Mean :15602   
## 3rd Qu.:16167 3rd Qu.:5.155e+09 3rd Qu.:16167   
## Max. :16590 Max. :9.878e+09 Max. :16590

Data<-xts(Data[, -1], order.by=as.Date(Data$Date))  
barChart(Data)

![](data:image/png;base64;base64,)