Converting .csv to Time Series

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Create Time Series

Generate time series from scratch.

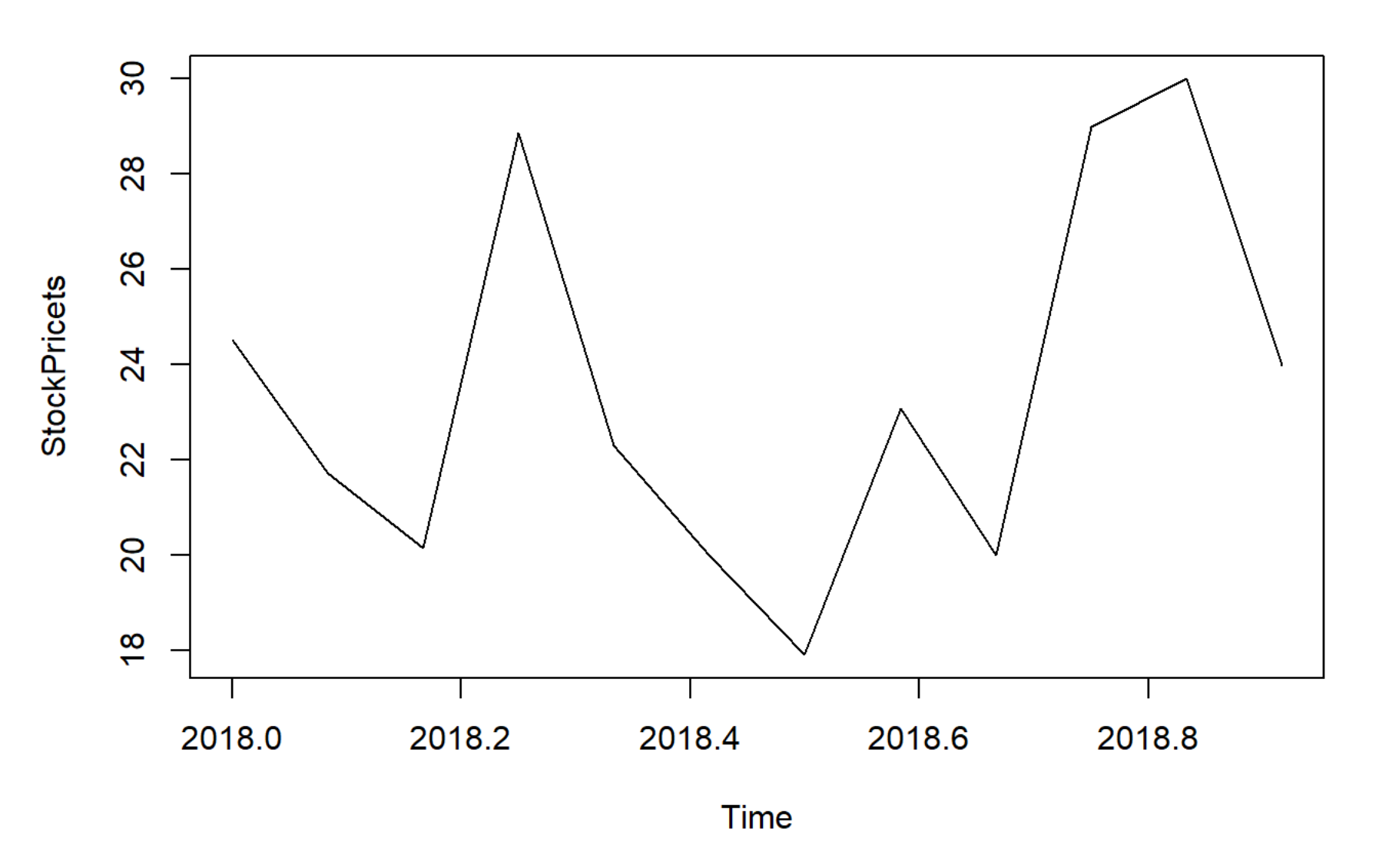
```
setwd("C:/Users/ddaya/OneDrive/Data Science Portfolio/Quantitative Finance")


################## CREATE TIME SERIES  ##########################

### Generate a time series: Exampple
  ## Example
    StockPrice<-c(24.52,21.72,20.14,28.87,22.3,20,17.9,23.08,20,29,30,23.98) # data
      StockPrice
```

```
##  [1] 24.52 21.72 20.14 28.87 22.30 20.00 17.90 23.08 20.00 29.00 30.00
## [12] 23.98
```

```
        StockPricets<- ts(StockPrice,start = c(2018,1),frequency = 12)  # set start dates of our data
          StockPricets
```

```
##        Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov
## 2018 24.52 21.72 20.14 28.87 22.30 20.00 17.90 23.08 20.00 29.00 30.00
##        Dec
## 2018 23.98
```

```
            plot(StockPricets) # graph
```



Example 1 - Convert .csv to Zoo

After importing the stock data, we analyze it.

```
### Convert data to time series: Example 1 --converting the dataset to Zoo after importing
  #import data
 library(readr)
```

```
## Warning: package 'readr' was built under R version 3.5.1
```

```
    StockData <- read_csv("GOOG.csv")
```

```
## Parsed with column specification:
## cols(
##   Date = col_date(format = ""),
##   Open = col_double(),
##   High = col_double(),
##   Low = col_double(),
##   Close = col_double(),
##   `Adj Close` = col_double(),
##   Volume = col_integer()
## )
```

```
        ### Estimate the Net-Return
          # let's suppose we invested $1358.18 on March 29 of 2020
            Investment<-1358.18
              StockData$Return<-StockData$`Adj Close`-Investment
                # set as time series
                   # install.packages("zoo") # I already have it installed
                      library(zoo)
```

```
## Warning: package 'zoo' was built under R version 3.5.1
```

```
##
## Attaching package: 'zoo'
```

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

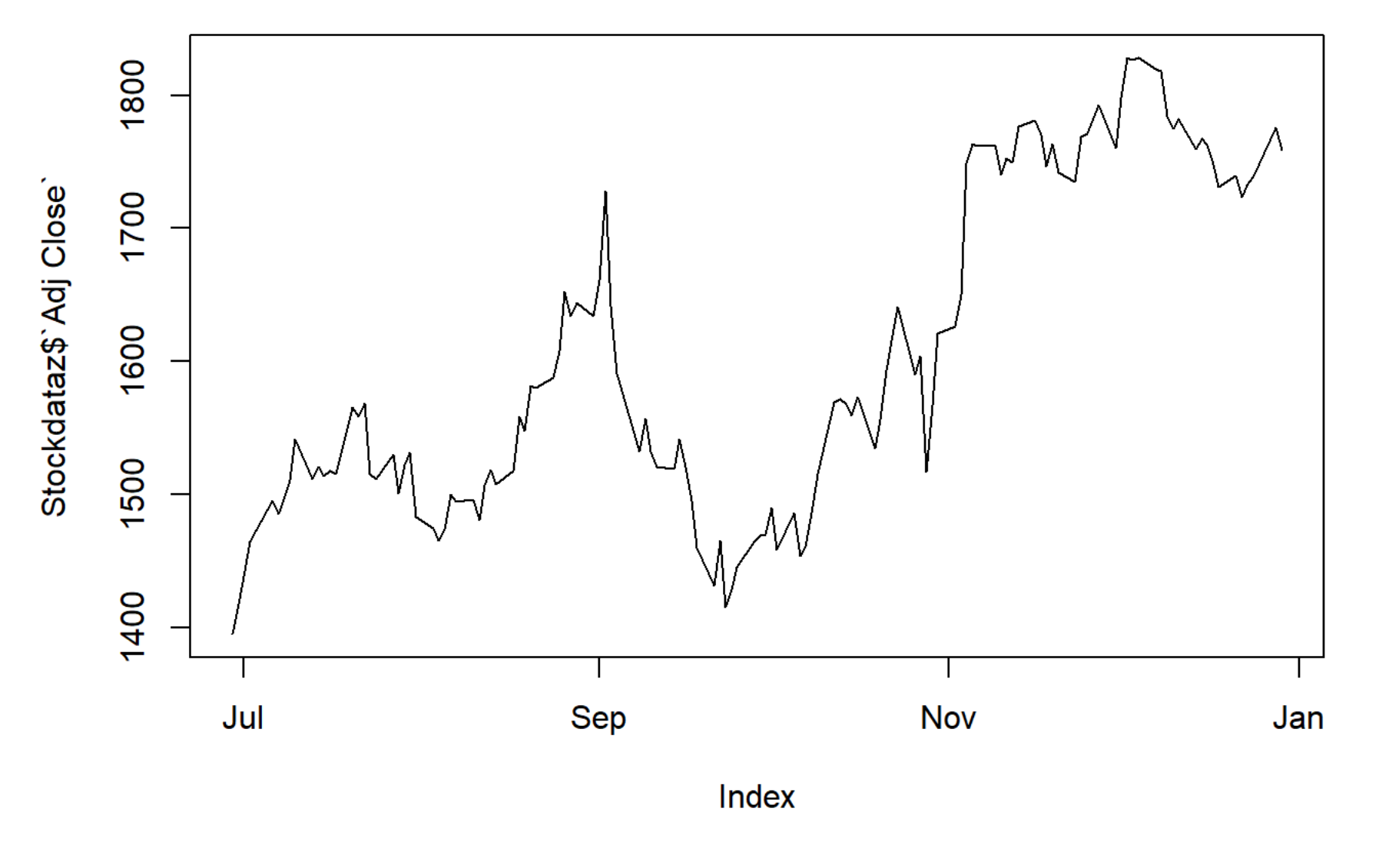
```
                              # select all dates after March 28, because, we invested on March 29.
                                StockData<-StockData[StockData$Date >= "2020-06-29" & StockData$Date <= "2020-12-30",]
                                  dt = as.Date(StockData$Date, format="%Y-%m-%d")
                                    Stockdataz = zoo(x=cbind(StockData$Volume,StockData$`Adj Close`), order.by=dt)
                                      colnames(Stockdataz) <- c("Volume","Adj Close")
                                        head(Stockdataz)
```

```
##             Volume Adj Close
## 2020-06-29 1810200   1394.97
## 2020-06-30 2042400   1413.61
## 2020-07-01 1775200   1438.04
## 2020-07-02 1859100   1464.70
## 2020-07-06 1564000   1495.70
## 2020-07-07 1458200   1485.18
```

```
summary(Stockdataz)
```

```
##      Index                Volume          Adj Close
##  Min.   :2020-06-29   Min.   : 346800   Min.   :1395
##  1st Qu.:2020-08-12   1st Qu.:1348875   1st Qu.:1505
##  Median :2020-09-28   Median :1591050   Median :1566
##  Mean   :2020-09-27   Mean   :1726113   Mean   :1601
##  3rd Qu.:2020-11-11   3rd Qu.:1859725   3rd Qu.:1740
##  Max.   :2020-12-29   Max.   :4329100   Max.   :1828
```

```
plot(Stockdataz$`Adj Close`)
```



Example 2 - converting .csv to Zoo

```
 #import data
    StockData <- read.zoo("GOOG.csv",header = TRUE, sep = ",",format="%Y-%m-%d")
      StockData[length(StockData$Open),] # to identify last date
```

```
##               Open    High     Low   Close Adj.Close  Volume
## 2020-12-29 1787.79 1792.44 1756.09 1758.72   1758.72 1299400
```

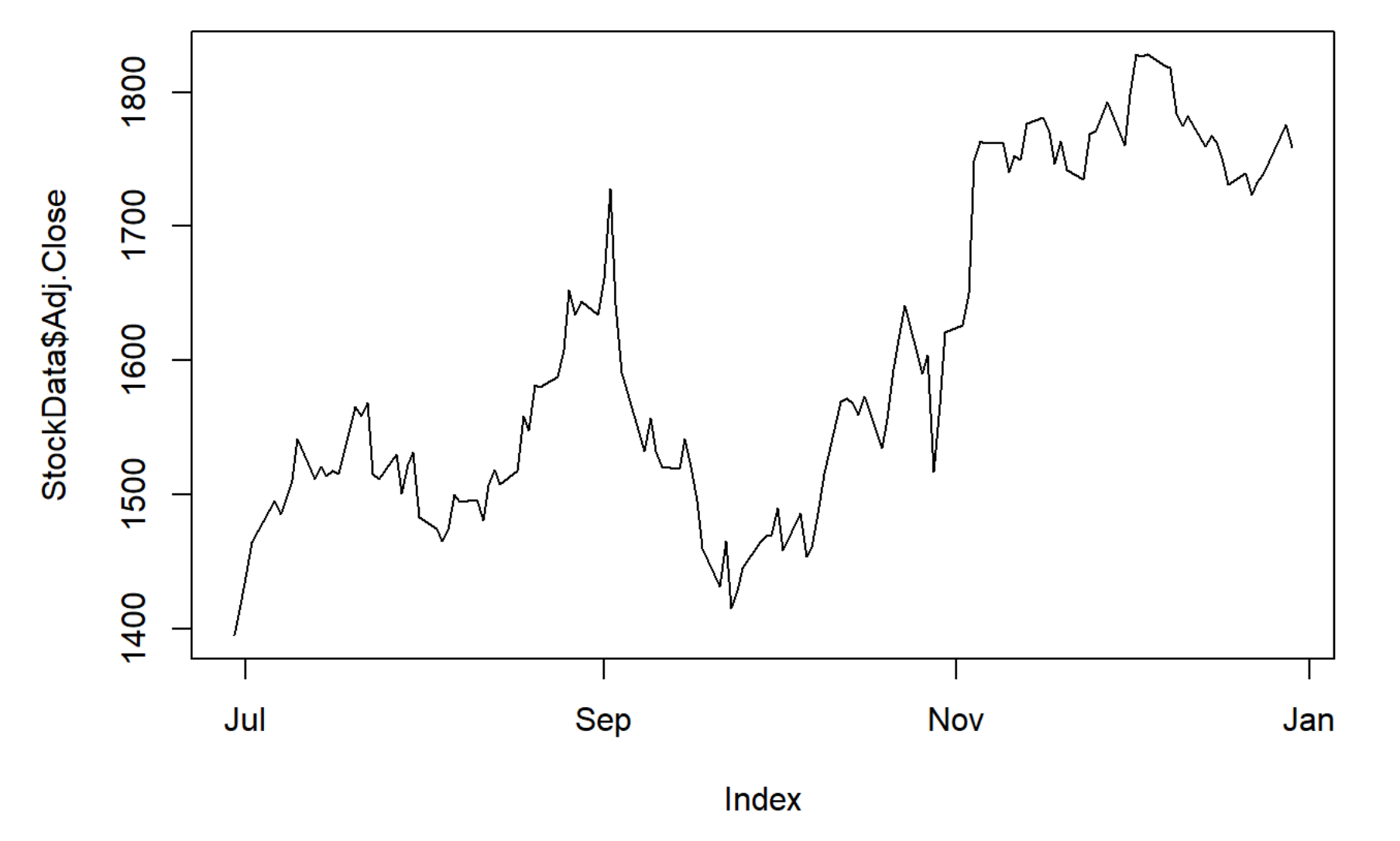
```
        StockData <- window(StockData, start=as.Date("2020-06-29"), end=as.Date("2020-12-30")) ## select all dates after Mar
ch 28, because, we invested on March 29.
          StockData$Return<-StockData$`Adj.Close`-Investment
            # Explotring the on our last 10 dates of the dataset, this also allows to verify our return at the end of the ye
ar.
              tail(StockData, n=10)
```

```
##                Open     High      Low   Close Adj.Close  Volume Return
## 2020-12-15 1764.420 1771.420 1749.950 1767.77   1767.77 1482300 409.59
## 2020-12-16 1772.880 1773.000 1756.080 1763.00   1763.00 1513500 404.82
## 2020-12-17 1768.510 1771.784 1738.660 1747.90   1747.90 1624700 389.72
## 2020-12-18 1754.180 1755.110 1720.220 1731.01   1731.01 4016400 372.83
## 2020-12-21 1713.510 1740.850 1699.000 1739.37   1739.37 1828400 381.19
## 2020-12-22 1734.430 1737.405 1712.575 1723.50   1723.50  936700 365.32
## 2020-12-23 1728.110 1747.990 1725.040 1732.38   1732.38 1033800 374.20
## 2020-12-24 1735.000 1746.000 1729.110 1738.85   1738.85  346800 380.67
## 2020-12-28 1751.635 1790.728 1746.335 1776.09   1776.09 1393000 417.91
## 2020-12-29 1787.790 1792.440 1756.090 1758.72   1758.72 1299400 400.54
```

```
summary(StockData)
```

```
##      Index                 Open           High           Low
##  Min.   :2020-06-29   Min.   :1358   Min.   :1396   Min.   :1347
##  1st Qu.:2020-08-12   1st Qu.:1498   1st Qu.:1517   1st Qu.:1486
##  Median :2020-09-28   Median :1561   Median :1585   Median :1541
##  Mean   :2020-09-27   Mean   :1599   Mean   :1620   Mean   :1582
##  3rd Qu.:2020-11-11   3rd Qu.:1735   3rd Qu.:1757   3rd Qu.:1721
##  Max.   :2020-12-29   Max.   :1825   Max.   :1847   Max.   :1823
##      Close        Adj.Close        Volume            Return
##  Min.   :1395   Min.   :1395   Min.   : 346800   Min.   : 36.79
##  1st Qu.:1505   1st Qu.:1505   1st Qu.:1348875   1st Qu.:146.87
##  Median :1566   Median :1566   Median :1591050   Median :208.30
##  Mean   :1601   Mean   :1601   Mean   :1726113   Mean   :243.05
##  3rd Qu.:1740   3rd Qu.:1740   3rd Qu.:1859725   3rd Qu.:381.44
##  Max.   :1828   Max.   :1828   Max.   :4329100   Max.   :469.81
```

```
plot(StockData$Adj.Close)
```



Example 3 - Converting Each Variable to Zoo

```
### Convert data to time series: Example 3 --converting each variable to Zoo

StockData <- read.table("GOOG.csv",header = TRUE, sep = ",")
  zVolume <-zoo(StockData[,2:2],as.Date(as.character(StockData[, 1]), format="%Y-%m-%d"))
    zAdj.Close <-zoo(StockData[,3:3],as.Date(as.character(StockData[, 1]), format="%Y-%m-%d"))
      zVars<-cbind(zVolume, zAdj.Close)
```

We see the first dates of our dataset

```
        head(StockData)
```

```
##         Date     Open     High      Low    Close Adj.Close  Volume
## 1 2014-12-30 526.6441 529.6957 525.6867 528.9677  528.9677  876200
## 2 2014-12-31 529.7955 531.1417 524.3604 524.9587  524.9587 1368200
## 3 2015-01-02 527.5616 529.8154 522.6650 523.3731  523.3731 1447500
## 4 2015-01-05 521.8273 522.8944 511.6552 512.4630  512.4630 2059800
## 5 2015-01-06 513.5900 514.7617 499.6781 500.5856  500.5856 2899900
## 6 2015-01-07 505.6118 505.8552 498.2820 499.7280  499.7280 2065000
```

Now, we explore the first dates of the variables that we changed to Zoo.

```
head(zVars)
```

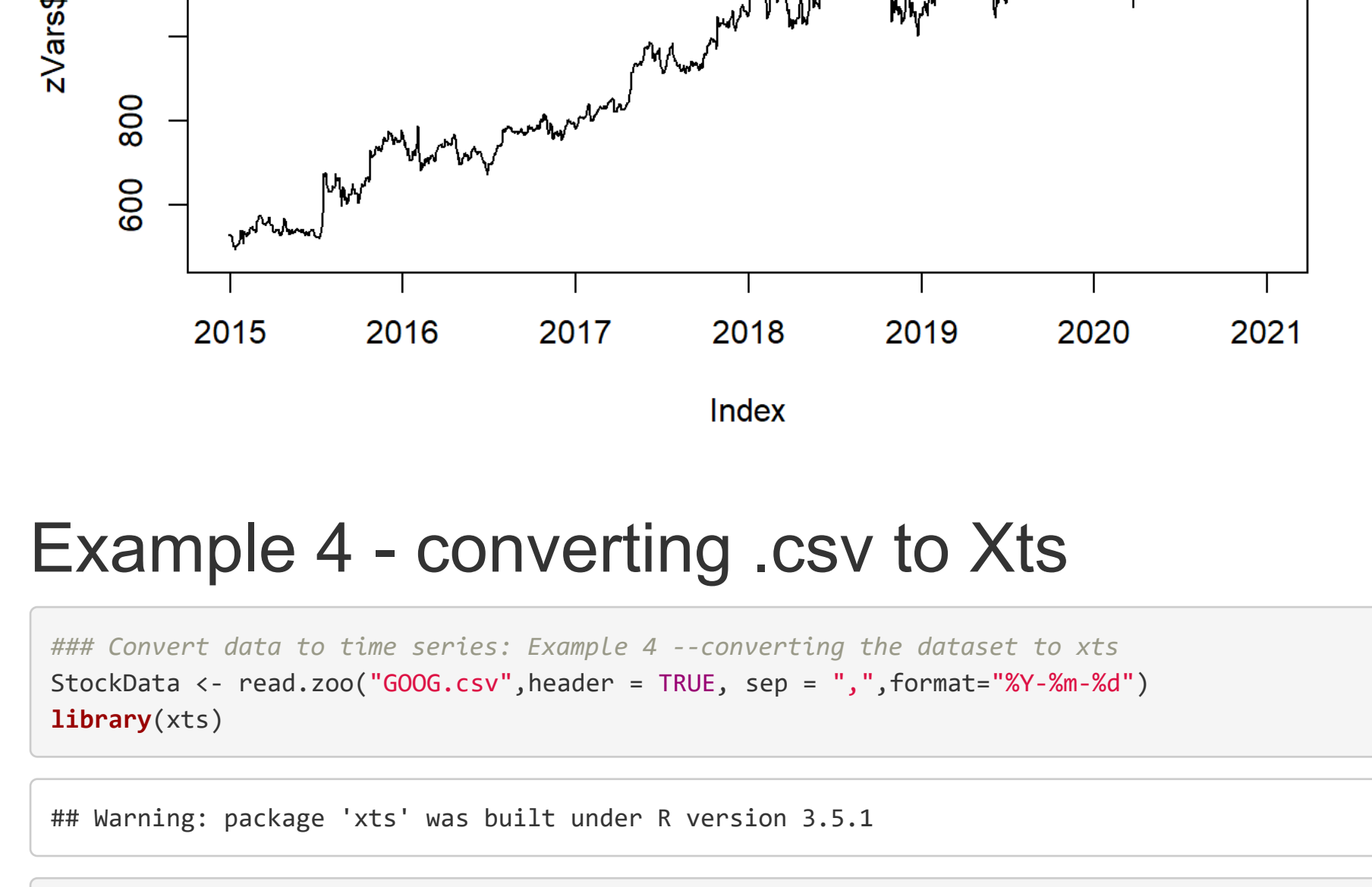
```
##             zVolume zAdj.Close
## 2014-12-30 526.6441   529.6957
## 2014-12-31 529.7955   531.1417
## 2015-01-02 527.5616   529.8154
## 2015-01-05 521.8273   522.8944
## 2015-01-06 513.5900   514.7617
## 2015-01-07 505.6118   505.8552
```

Let us explore the variables.

```
summary(zVars)
```

```
##      Index               zVolume         zAdj.Close
##  Min.   :2014-12-30   Min.   : 493.3   Min.   : 494.6
##  1st Qu.:2016-06-29   1st Qu.: 752.4   1st Qu.: 758.0
##  Median :2017-12-28   Median :1027.2   Median :1040.4
##  Mean   :2017-12-29   Mean   :1006.5   Mean   :1016.3
##  3rd Qu.:2019-07-01   3rd Qu.:1195.3   3rd Qu.:1204.2
##  Max.   :2020-12-29   Max.   :1824.5   Max.   :1847.2
```

```
plot(zVars$zAdj.Close)
```



Example 4 - converting .csv to Xts

```
### Convert data to time series: Example 4 --converting the dataset to xts
StockData <- read.zoo("GOOG.csv",header = TRUE, sep = ",",format="%Y-%m-%d")
library(xts)
```

```
## Warning: package 'xts' was built under R version 3.5.1
```

```
  matrix_xts <- as.xts(StockData,dateFormat='POSIXct')
    head(matrix_xts)
```

```
##                Open     High      Low    Close Adj.Close  Volume
## 2014-12-30 526.6441 529.6957 525.6867 528.9677  528.9677  876200
## 2014-12-31 529.7955 531.1417 524.3604 524.9587  524.9587 1368200
## 2015-01-02 527.5616 529.8154 522.6650 523.3731  523.3731 1447500
## 2015-01-05 521.8273 522.8944 511.6552 512.4630  512.4630 2059800
## 2015-01-06 513.5900 514.7617 499.6781 500.5856  500.5856 2899900
## 2015-01-07 505.6118 505.8552 498.2820 499.7280  499.7280 2065000
```

```
summary(matrix_xts)
```

```
##      Index                 Open             High             Low
##  Min.   :2014-12-30   Min.   : 493.3   Min.   : 494.6   Min.   : 486.2
##  1st Qu.:2016-06-29   1st Qu.: 752.4   1st Qu.: 758.0   1st Qu.: 745.6
##  Median :2017-12-28   Median :1027.2   Median :1040.4   Median :1016.3
##  Mean   :2017-12-29   Mean   :1006.5   Mean   :1016.3   Mean   : 997.1
##  3rd Qu.:2019-07-01   3rd Qu.:1195.3   3rd Qu.:1204.2   3rd Qu.:1185.8
##  Max.   :2020-12-29   Max.   :1824.5   Max.   :1847.2   Max.   :1822.7
##      Close           Adj.Close          Volume
##  Min.   : 491.2   Min.   : 491.2   Min.   :  346800
##  1st Qu.: 751.1   1st Qu.: 751.1   1st Qu.: 1242050
##  Median :1027.8   Median :1027.8   Median : 1525200
##  Mean   :1007.1   Mean   :1007.1   Mean   : 1737910
##  3rd Qu.:1195.6   3rd Qu.:1195.6   3rd Qu.: 1973300
##  Max.   :1828.0   Max.   :1828.0   Max.   :11164900
```

```
plot(matrix_xts$Adj.Close)
```