Assignment 04, Question 1&2

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FBE 543 Forecasting and Risk Analysis

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Question 1

Downloading data:

```
library(quantmod)
```

```
## Loading required package: xts
```

```
## Loading required package: zoo
```

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

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

```
## Loading required package: TTR
```

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

```
## Version 0.4-0 included new data defaults. See ?getSymbols.
```

```
# Set start date and end date of data
start_date <- "2018-01-01"
end_date <- "2021-03-17"

# Get data
getSymbols("AAPL", src = "yahoo", from = start_date, to = end_date)
```

```
## 'getSymbols' currently uses auto.assign=TRUE by default, but will
## use auto.assign=FALSE in 0.5-0. You will still be able to use
## 'loadSymbols' to automatically load data. getOption("getSymbols.env")
## and getOption("getSymbols.auto.assign") will still be checked for
## alternate defaults.
##
## This message is shown once per session and may be disabled by setting
## options("getSymbols.warning4.0"=FALSE). See ?getSymbols for details.
```

```
## [1] "AAPL"
```

```
getSymbols("^GSPC", src = "yahoo", , from = start_date, to = end_date) # S&P 500
```

```
## [1] "^GSPC"
```

```
# Adjusted Prices
adjAAPL <- AAPL$AAPL.Adjusted
adjGSPC <- GSPC$GSPC.Adjusted
# Get adjusted returns data
#rAAPL <- diff(log(to.monthly(AAPL)$AAPL.Adjusted))
#rGSPC <- diff(log(to.monthly(GSPC)$GSPC.Adjusted))
```

a. Graph your AAPL against time (scatter diagram). Comment on the existence of time trend, seasonal trend, cyclical trend, autocorrelation, randomness, structural breaks, and outliers.

```
plot(adjAAPL, main="AAPL")
```


AAPL
2018−01−02 / 2021−03−16
140
120
100
80
60
40
Jan 02 2018
Jan 02 2019
Jan 02 2020
Dec 31 2020