The problems of this assignment are from §2.4 R Lab and §2.5 Exercises of Ruppert and Matteson 2015 (attached).

**2.4.1** Data Analysis

- Problems 1-2
- Do Problem 3 with R package "quantmod", see Handout 1.
  - Install and load the package.
  - Use `getSymbols()` to load the last 10 years of stock quotes of Microsoft and Merck, stock symbols are MSFT and MRK. Specify `from = "2011-01-01"` and `to = "2021-01-01"`.
  - Plot both adjusted closing price of Microsoft and Merck in one frame.

    ```
    >plot(cbind(Ad(MSFT),Ad(MRK)), legend.loc = "topleft")
    ```

    The function `plot()` calls `plot.xts()` because the data downloaded or computed using `quantmod` functions are of xts class. If you like to change the settings such as colors and labels, find the help file with the command `help(plot.xts)`.
  - Use `dailyReturn()` to compute both returns and log returns.
  - Repeat Problems 1 and 2 for Microsoft and Merck. When plot scatter plots, it requires to convert a time series to a numerical vector with the R functions `as.numeric()` or `as.vector()`.

**2.4.2** Problem 4 only.

**2.4.3** Problems 9-11. The codes will produce 9 plots ($3 \times 3$), these plots will be very difficult to see with the default size of R Markdown. Please change the size by setting the height at the beginning, for example,

```
///{r, fig.height=8}
```

You should adjust the value when necessary, "8" may not work for your R Markdown document. Also, plot the line plots, set `type = "l"` instead of `"b"` for both.

**2.4.4** Problems 12-15, 17.

**2.5 Exercises** Questions 1 and 4. All computation should be done in R.