MATH 5075 R Project 9

Your Name Here

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Remember: I expect to see commentary either in the text, in the code with comments created using **#**, *or (preferably) both!* ***Failing to do so may result in lost points!***

Since this assignment involves simulation, I set the seed to the following in order to get the same results:

```
set.seed(5292016)
```

Problem 1

Use **garchSim()** *from the* **fGarch** *package to simulate 200 observations from the following GARCH(1,1) processes (you may use the default burn-in period), and plot them:*

$$\omega = 0.1, \alpha = 0.1, \beta = 0.1$$

$$\omega = 0.7, \alpha = 0.1, \beta = 0.1$$

$$\omega = 0.001, \alpha = 0.1, \beta = 0.1$$

$$\omega = 0.1, \alpha = 0.7, \beta = 0.1$$

$$\omega = 0.1, \alpha = 0.1, \beta = 0.7$$

$$\omega = 0.1, \alpha = 0.49, \beta = 0.49$$

In addition to plotting the simulated processes, also plot the ACF and PACF of each simulated process, and compare to what would be seen for AR(p) *or* MA(q) *processes.*

```
# Your code here
```

Problem 2

Use **garchFit()** *from the* **fGarch** *package to fit a GARCH*$(1,1)$ *model to the* **nyse** *data set (***astsa***), using the quasi-maximum likelihood estimator. After fitting a model, simulate a GARCH*$(1,1)$ *model with the same parameters as the fitted model, and with 2000 observations. Does the simulated process look similar to that of the actual NYSE data?* (Hint: If you save the fitted model in `x`, you can access the coefficients with `x@fit$coef`; the `@` accessor is similar to the `$` accessor, but is used for S4 class R objects.)

```
# Your code here
```