

MATH 5075 R Project 11

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(3132017)
```

Problem 1

1. Generate a stationary series with 200 observations using `rnorm()`. Use the function `adf.test()` in the package `tseries` to verify that this series is stationary.

```
# Your code here
```

2. Generate a random walk with Normally-distributed increments with 200 observations using `rnorm()`. Use `adf.test()` to verify that the series is not stationary.

```
# Your code here
```

3. Generate yet a third series that is the sum of the series from the previous two parts. Is this a stationary sequence? Justify your answer.

```
# Your code here
```

4. We know that the series in parts 2 and 3 above are cointegrated. Use the Engle-Granger procedure to verify this. Consider using the `egcm()` function in the `egcm` package.

```
# Your code here
```

Problem 2

The following code downloads stock data for Chevron and ExxonMobile through 2016 using the package `quantmod` designed for managing financial data.

```
if (!require("quantmod")) {
  install.packages("quantmod")
  require("quantmod")
}

from_date <- as.Date("2016-1-1")
to_date <- as.Date("2016-12-31")

CVX <- getSymbols("CVX", return.class="ts", auto.assign=FALSE,
  from=from_date, to=to_date)[,"CVX.Adjusted", drop=TRUE]
XOM <- getSymbols("XOM", return.class="ts", auto.assign=FALSE,
  from=from_date, to=to_date)[,"XOM.Adjusted", drop=TRUE]
```

1. Plot these two series. Do they appear stationary? Cointegrated?

```
# Your code here
```

2. Use the augmented Dickey-Fuller test and the Engle-Granger procedure to test the conjectures made above.

```
# Your code here
```