CIEG 675
INCLASS #1 Due **Wednesday January 13, 2021 by 11:59p**

1) Use the following data (copy/paste into your script) to complete this problem:

$$y(x) = p_1 + p_2 x$$

where,

```
x = 0:0.1:20;
noise = ?? % a number, you need to define!
y = 4*x + noise*rand(1,length(x)); % rand outputs uniformly distributed
random numbers between 0 & 1. We will discuss later
```

Vary the value for `noise` **as 0, 50 and 100** to get three different results for p_1 and p_2, using the following 3 approaches:

(a) From a linear algebra standpoint, determine the coefficients, p_1 and p_2, of the least-squares-regression of a line fit through the data defined above.

(b) Explore the `polyfit` function and compare your answers for the three tests in 4(a). Are they the same? Are they different?

(c) Explore the `regress` function and compare your answer. Specifically, use the built-in function that allows output `[B,BINT,R,RINT,STATS]`. (For now, we will only need `B`, which is the solution matrix.) Are your answers for the coefficients the same?

Report your results for p_1 and p_2 with all three values of noise and from all three methods in the supplementary Word document (in a table), or simply output the results to the command window. (There *is* a simple and clean way to do this problem with 2D matrices by the way, so kudos if you can do it that way)