

# Homework1\_EEB590C

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## EEB590C -Homework 1

### Homework 1: Lectures 1-4

This assignment is due prior to class in week 6. You are to self-select and work in groups: 2-3 in a group. For the assignment below submit one R-script. Annotations via comments are highly encouraged. The script should run!

#### Assignment Instructions:

1: Select some form of linear model containing a single dependent variable (continuous) and at least 1 independent variable. Next, simulate two datasets: the first with no relationship between X & Y, and the second with some positive association between X & Y. Perform 100 simulations under each condition. Run the linear models on all datasets to confirm that on average, the patterns for condition 1 (no relationship) and condition 2 (some relationship) are met. (HINT: this requires determining an appropriate summary measure extracted from the linear model).

2: Devise a permutation procedure to evaluate the above linear model. Write code for this permutation procedure. Next, devise a SECOND implementation of the same permutation procedure (ie, code the procedure in a different manner). For a single dataset compare the two implementations for their computational performance. Summarize your findings via comments in the code (e.g., which approach was faster? Which components of the slower approach could be improved, etc.).

#### Homework Breakdown:

Select some form of linear model containing a single dependent variable (continuous) and at least 1 independent variable.

```
#TODO
```

Next, simulate two datasets: the first with no relationship between X & Y, and the second with some positive association between X & Y.

```
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```

Perform 100 simulations under each condition.

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Run the linear models on all datasets to confirm that on average, the patterns for condition 1 (no relationship) and condition 2 (some relationship) are met. (HINT: this requires determining an appropriate summary measure extracted from the linear model).

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#TODO
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Devise a permutation procedure to evaluate the above linear model.

*#TODO*

Write code for this permutation procedure.

*#TODO*

Next, devise a SECOND implementation of the same permutation procedure (ie, code the procedure in a different manner). For a single dataset compare the two implementations for their computational performance.

*#TODO*

Summarize your findings via comments in the code (e.g., which approach was faster? Which components of the slower approach could be improved, etc.).