Due data: 2/18/2019, end of the day.

Please submit an .ipynb file (i.e., Jupyter file) via Canvas.

In this homework, we write a program to find the coefficients for a linear regression model. You need to use Python to implement the following methods of finding the coefficients:

1) Normal equation, and
2) Gradient descent (batch or stochastic mode)
   a) Print the cost function vs. iterations
   b) Discuss how you choose the right alpha (learning rate). For example, you can plot cost function vs. learning rate to determine the best learning rate.

A simulated dataset will be provided, you job is to find the coefficients that can accurately estimate the true coefficients. Your solution should be 2 for intercept and 3, 4, 5 for the three coefficients.

Please do NOT use the fit() function of the Scikit-Learn library in your program. (You need to implement the Gradient Descent algorithm in your code.)

Simulated data is given as follows in Python:

```
import numpy as np

x1 = 2 * np.random.rand(100, 1)

x2 = 2 * np.random.rand(100, 1)

x3 = 2 * np.random.rand(100, 1)

y = 3 * x1 + 4 * x2 + 5 * x3 + np.random.randn(100, 1) + 2
```