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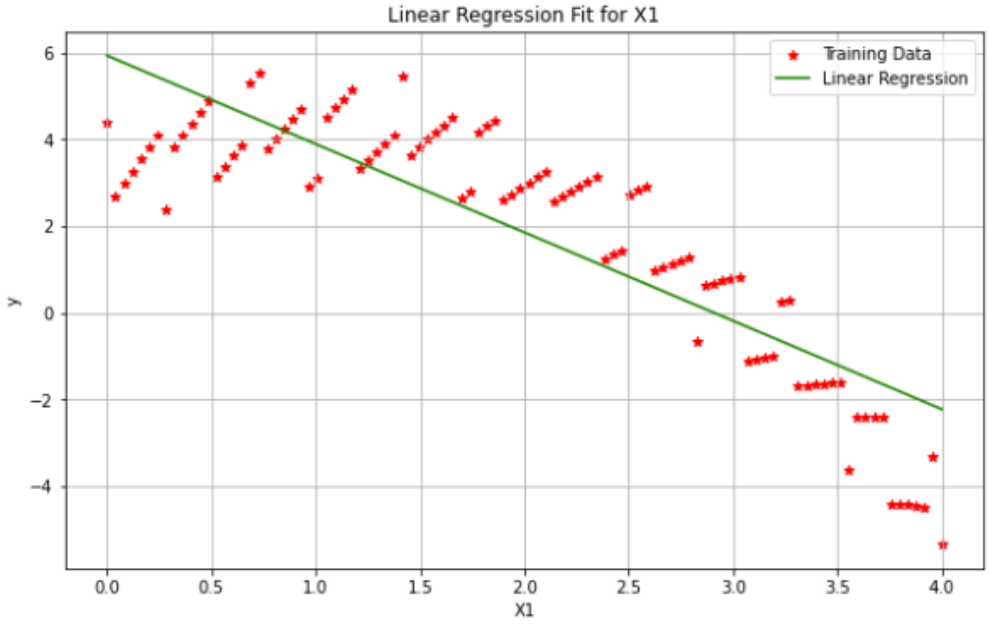
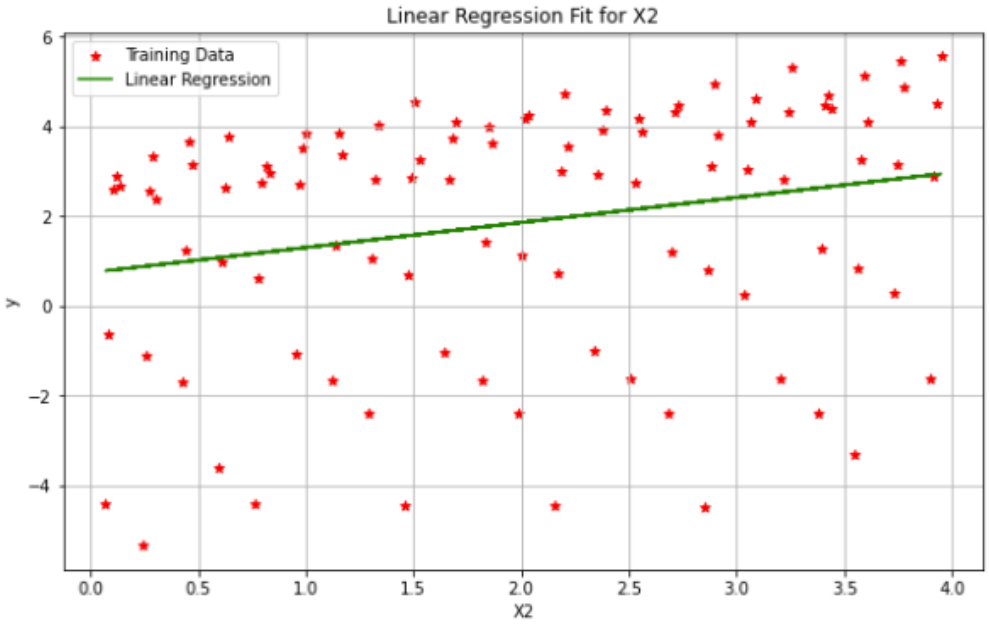
Homework 0

GitHub: https://github.com/pballou/ECGR_4105/tree/master/Homework/homework_0

Problem 1:

1. Linear models
    a. X1: h(x) = 5.93*x1 – 2.04
    b. X2: h(x) = .74*x1 + .56
    c. X3: h(x) = 2.87*x1 - .52
2. Regression models and loss graphs:





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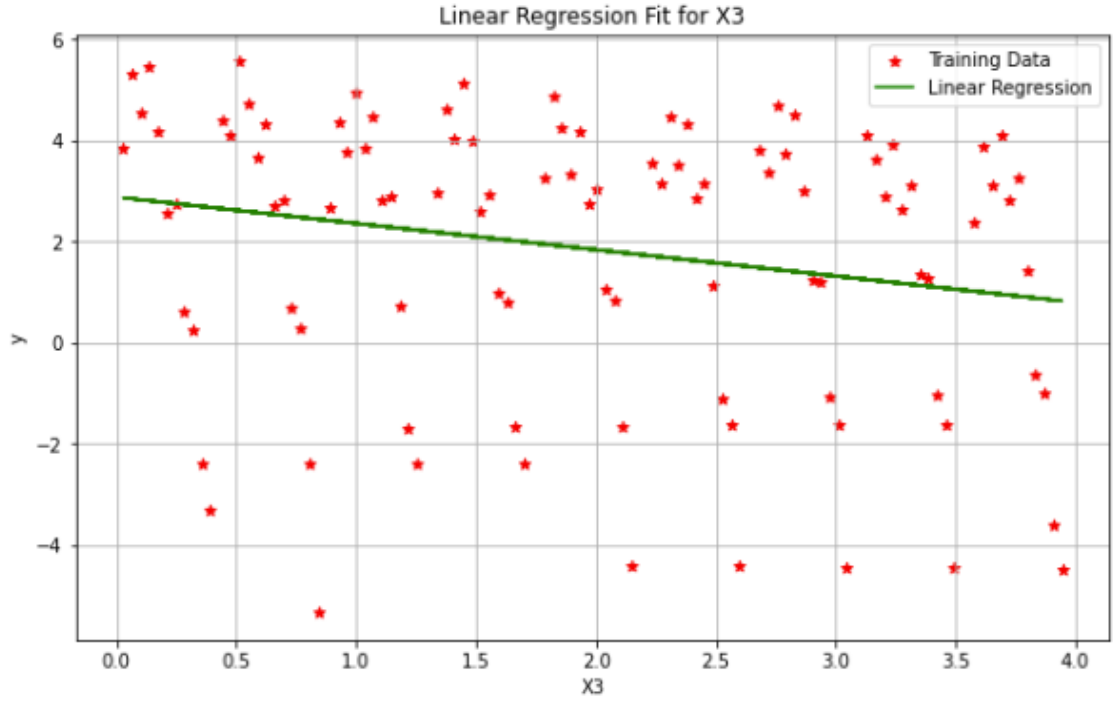

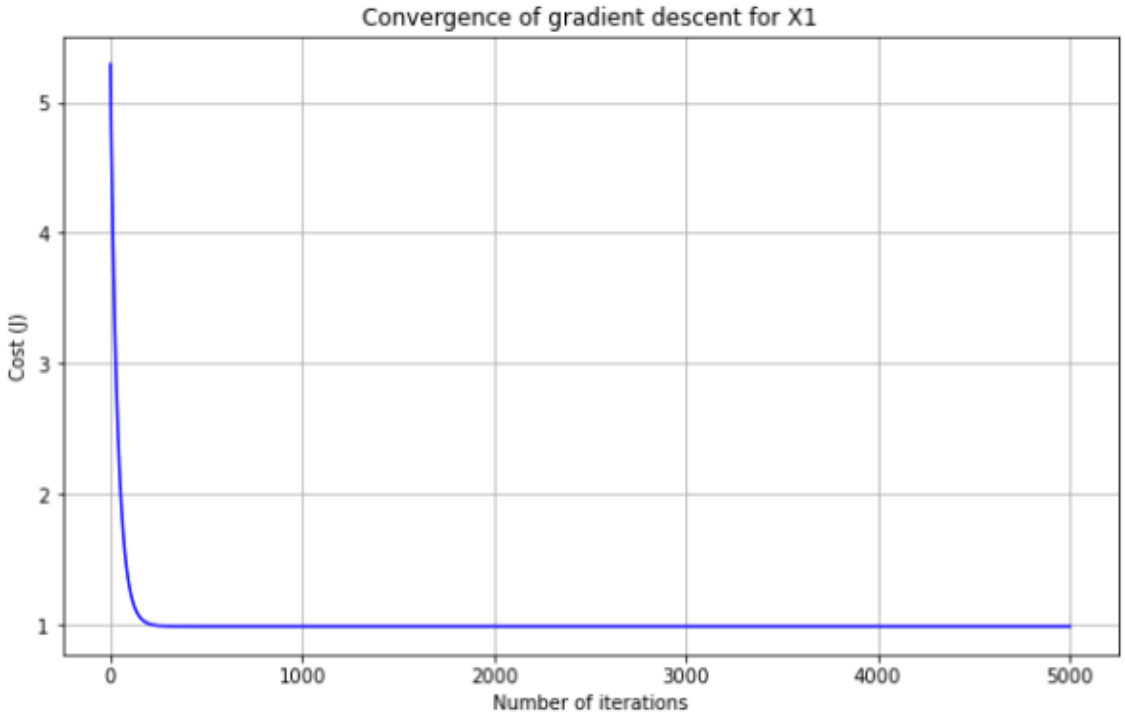

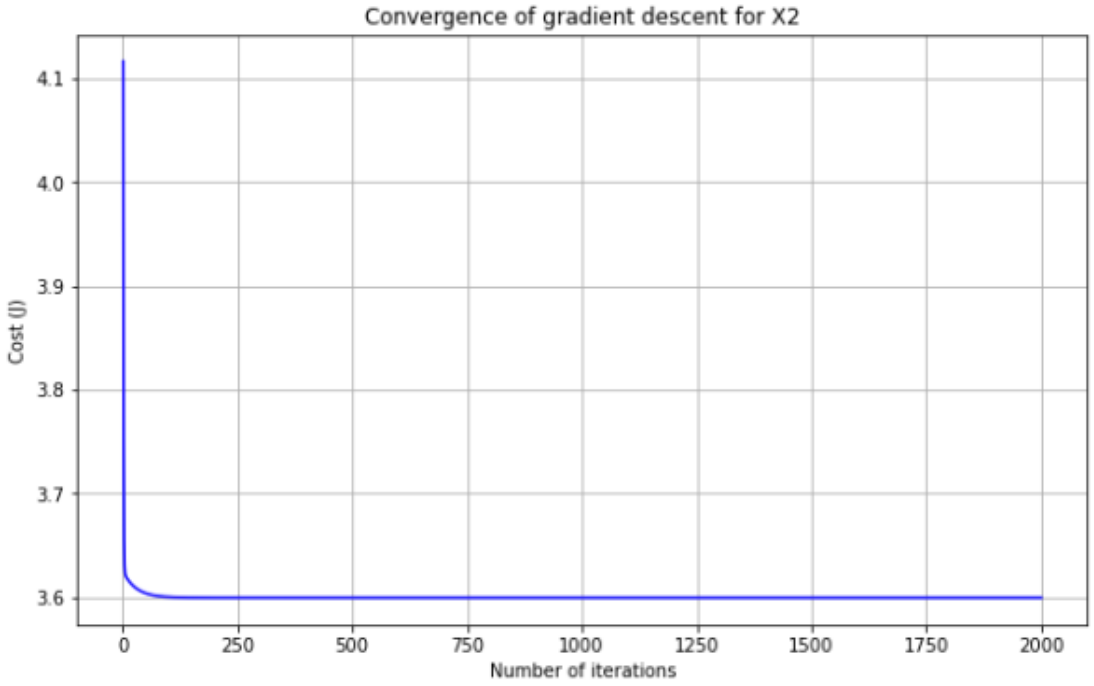

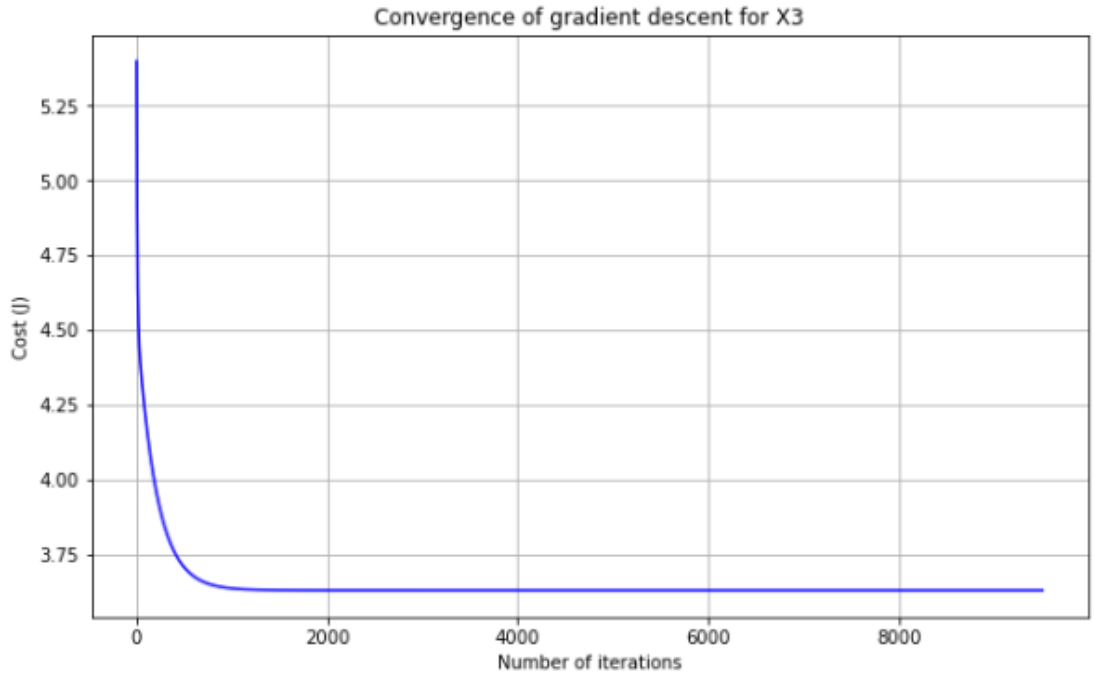

3. X1 has the lowest loss.
4. If I went too low, like alpha = .01 and less, the final loss would get worse. I basically just played around with the learning rate and found the one that resulted in the lowest final loss. The number of iterations didn't make a difference past a certain point, but it wouldn't quite converge if I went too low. This varied for each X input.

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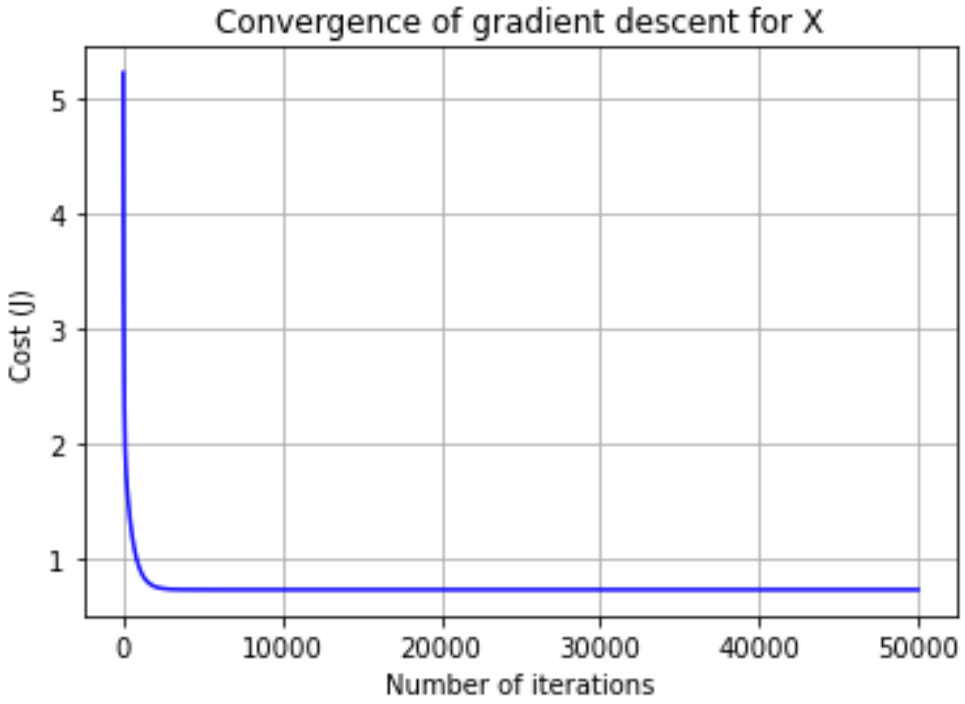
Problem 2:

1. h(X) = 5.31*x3 – 2.00*x2 + .53*x1 - .27
2. 

3. The lowest loss I was able to achieve was ~.738464. In general, even higher learning rates (.1) produced roughly the same final cost if the number of iterations was increased.
4. Predictions:
    a. h(1,1,1) = 3.58
    b. h(2,0,4) = .24
    c. h(3,2,1) = .10