**Homework 0**

Problem 1:

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

Chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart, scatter chart

Description automatically generated

Chart

Description automatically generated with medium confidence

Chart, line chart

Description automatically generated Graphical user interface

Description automatically generated

1. X1 has the lowest loss.
2. 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.

Problem 2:

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

Chart

Description automatically generated

1. 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.
2. Predictions:
   1. h(1,1,1) = 3.58
   2. h(2,0,4) = .24
   3. h(3,2,1) = .10