Machine Learning Homework 1

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1 Problem 1

Using a value $\alpha = 0.1$, my gradient decent code yielded the following values for the hypothesis function parameters $\theta_0, \theta_1, \theta_2, \theta_3$:

$$\theta_0 = 5.314167 \tag{1}$$
$$\theta_1 = -2.003719 \tag{2}$$
$$\theta_2 = 0.532563 \tag{3}$$
$$\theta_3 = -0.265602 \tag{4}$$

Below are some predicted values for y based on different inputs (x_1, x_2, x_3):

$$\begin{aligned}(1,1,1) \Rightarrow y &= (5.314167) + (-2.003719)(1) \\ &\quad + (0.532563)(1) + (-0.265602)(1) = \mathbf{3.577409}\end{aligned} \tag{5}$$
$$\begin{aligned}(2,0,4) \Rightarrow y &= (5.314167) + (-2.003719)(2) \\ &\quad + (0.532563)(0) + (-0.265602)(4) = \mathbf{0.244321}\end{aligned} \tag{6}$$
$$\begin{aligned}(3,2,1) \Rightarrow y &= (5.314167) + (-2.003719)(3) \\ &\quad + (0.532563)(2) + (-0.265602)(1) = \mathbf{0.102534}\end{aligned} \tag{7}$$

This is all that was required for problem 1. Check out my code in `Problem1.c`.

2 Problem 2

My analytical solution code computed the following values for the hypothesis function parameters $\theta_0, \theta_1, \theta_2, \theta_3$:

$$\theta_0 = 2626.268614, \tag{8}$$
$$\theta_1 = 0.420484, \tag{9}$$
$$\theta_2 = 12.716237, \tag{10}$$
$$\theta_3 = -6.496562. \tag{11}$$

This is all that was required for problem 2. Check out my code in `Problem2.c`.