Intelligent Systems: Reasoning and Recognition

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Use your favorite computing language or environment to estimates the weight for a person given their height using gradient descent to estimate parameters for a linear model $\hat{y} = f(\bar{X}, \vec{w})$

$$\hat{y} = Weight \qquad \bar{X} = \begin{pmatrix} 1 \\ Height \end{pmatrix}$$

Test your program with the following table. First run the algorithm with the raw data. Initialize your model as zero, and then let the your program run for 100 iterations using alpha values of 0.1, 0.01, 0.001 and 0.0001. For each iteration, i, print out the value of the Loss function $L(\vec{w}^{(i)})$ and the coefficients $\vec{w}^{(i)}$. Does the algorithm converge?

Now normalize the data so that the scale is between 0 and 1 and repeat the exercise. How does normalization affect convergence? Be sure to undo the normalization when you project the resulting line back onto the original data.

As your answer, return the values for alpha, i, $L(\vec{w}^{(i)})$, $w_0^{(i)}$, $w_1^{(i)}$ after 100 iterations for each alpha by email. There is no need to send your code.

M	Height	Weight
1	145	46
2	154	56
3	158	61
4	161	64
5	172	77
6	158	62
7	163	67
8	169	73
9	156	58
10	161	65