# 18-748. Lab1. Assignment 2.

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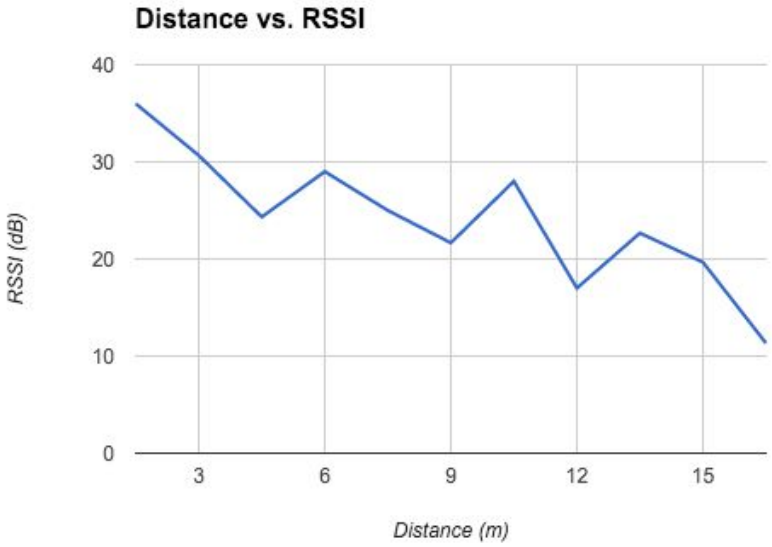
## Initial Investigation.

After the code was edited per the instructions, three RSSI data points were taken at eleven different distances ranging from 1.5m to 16.5m. The graph of the results is shown below. Each data point was determined by averaging the three points available at each distance.




## Determining the Path Loss Exponent.

First, consider the equation below that describes the relationship between distance and path loss.

$$L = 10\,n * log(d) + C$$

In this equation L is path loss, n is the desired path loss exponent, d is the distance, and C is a constant. Because an absolute distance was unknown, a distance difference was used to determine n. To do this, however, the above equation must be written:

$$L_2 - L_1 = 10\,n * log(d_2/d_1)$$

Noting that $RSSI_2 - RSSI_1 = L_2 - L_1$ and solving for n, the result it:

$$n = (RSSI_2 - RSS1_1)/(10log(d_2/d_1)$$

When the above formula was applied to the data shown in the above graph the path loss executed was determined to be 1.72 with a standard deviation of 0.49 and a variance of 0.24.