

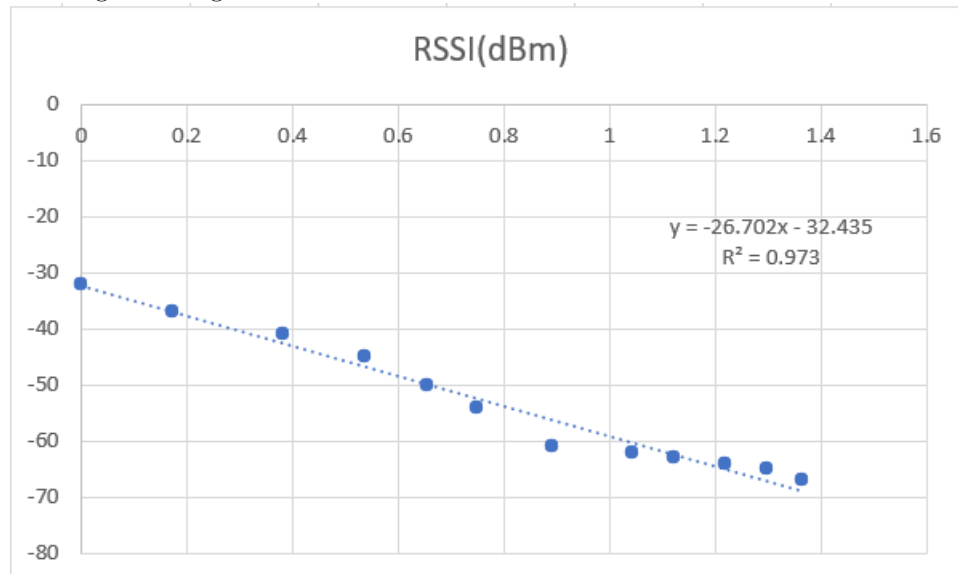
# CS425 Assignment-1

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## Step 1 - Finding Path Loss Exponent

In this step I plotted the graph using signal strength and distance between transceivers. Also I found out that in free space it (WiFi Analyzer app) gives same signal strength for different orientation.



According to the best fit line for the above log-log plot:

Slope = -26.702

and Hence path loss exponent  $n = \frac{26.702}{10} = 2.67$

From the excel sheet:

Variance of these RSSI samples wrt best fit line = 3.648299981

## Step 2 - Range Estimation

Using the formula:

$$P_r(d) = P_r(d_0) - 10n \log_{10} \left( \frac{d}{d_0} \right)$$

we get:

$$d = d_0 \left( 10^{\frac{P_r(d_0) - P_r(d)}{10n}} \right)$$

using  $d_0 = 1$ ,  $n = 2.67$  and  $P_r(d_0) = -32.435$  we get:

$$d = 10^{-\left( \frac{32.435 + P_r(d)}{26.702} \right)}$$

Average distance error by comparing with actual distance (according to excel sheet) = 1.347