CS425: Computer Networks

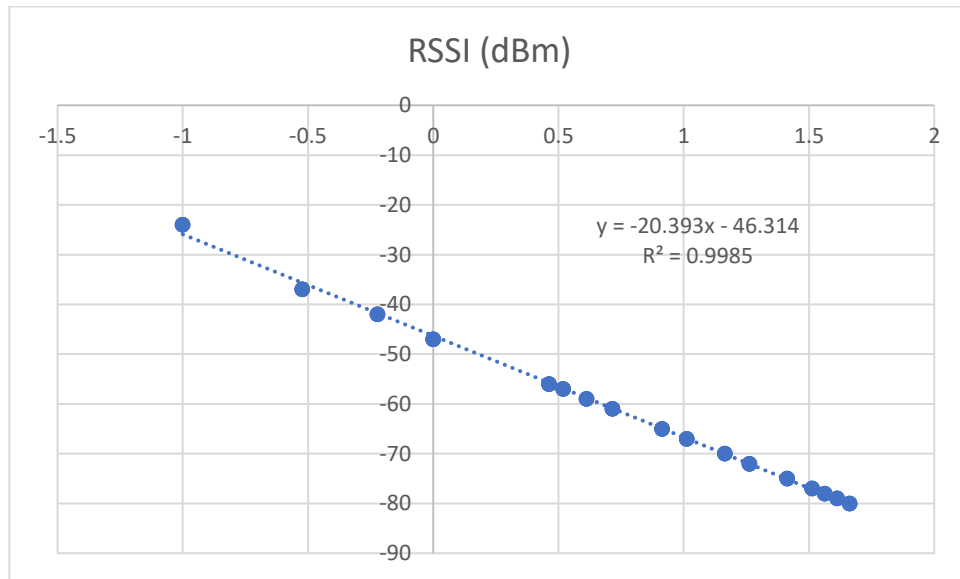## HW 2

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Link to sheet: [Link](#)

Step 1) Finding Path Loss Exponent

First of all I measured the signal strength of Access Point with respect to distance using a WiFi Analyzer App. This measurement is done for 4 orientations and I observe that no change in signal strength is recorded.

Trend Line Curve

d) Slope of best fit line = -20.393

Hence path loss exponent **(n)** = 20.393/10 = 2.04

e) From the excel sheet we can see that the variance of samples with respect to best fit line

$$\sum (\text{RSSI} - \text{RSSI\_from\_best\_fit\_line})^2/68 = 0.373$$

Step 2) Range Estimation

a) Distance estimation using the formula done in excel sheet (Column E)

$$\text{Formula used to estimate distance / range} = 10^{-(P - P(\text{at } d = 1m))/10n}$$

$$= 10^{-(P + 46.314)/20.393}$$

b) Average error is calculated as $\sum \text{abs (dist} - \text{estimated\_distance})/68 = 0.27$

Findings: The experiment was conducted in an obstruction-free environment, with no obstacles between the router access point and phone, therefore the path loss exponent was about 2, as expected in the ideal scenario. The average error between the distance estimated using the method and the actual distance is 0.27, indicating good path loss exponent findings from part 1.