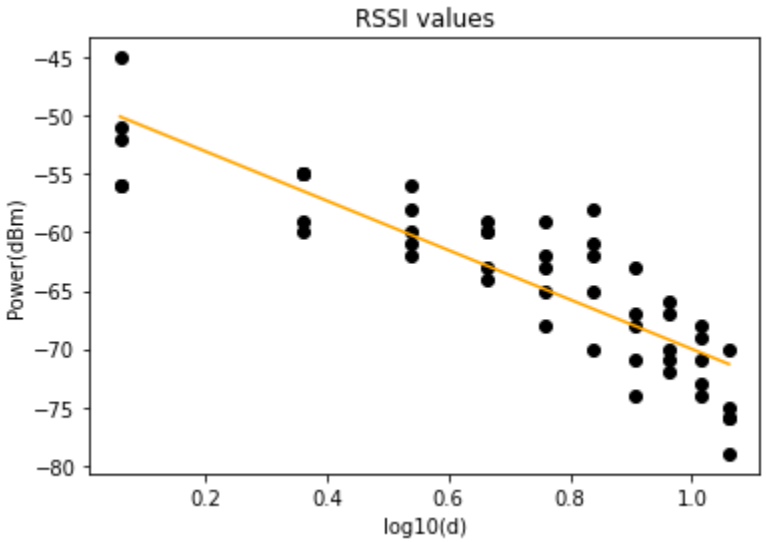
CS425 Homework-1

Experimental Setup:

- Access point : Mobile Hotspot
- Location : Hall of Residence's corridor
- Weather : Cloudy
- Application used: Wifi Analyzer

Outcomes:

Path loss Exponent



As we can see in the graph

- We got different values for different orientations of the phone at the same distance , also it was not minor but sometimes significant which can be due to reasons like:
    - Location of receiver can vary in different orientations
    - Receiver can be obstructed more in some orientation than other(by the mobile itself)

- Value of n(path loss exponent) turned out to be 2.14 which is close to the path loss exponent value in free space. We got this value so close to 2 because I performed the experiment with minimal obstructions in between but anyways there were some obstructions from walls, pillars, etc.
- Shadowing variance came out to be ~12.5 which is due to reflection, absorption and other attenuation of the signal.

Range Estimation:

- For d0=1m, I used 5 data in different orientations of phone and used the average of these value i.e. -50.2 dBm as Pr_d0

RSSI value (in dBm)	Calculated Distance	Actual Distance	Error
-55	1.7 m	2.3 m	0.6 m
-59	2.6 m	4.6 m	2.0 m
-63	4.0 m	6.9 m	2.9 m
-68	6.9 m	9.2 m	1.3 m
-74	13.2 m	11.5 m	1.7 m

- Average error in distance was 1.9 m which is significant error as my datapoints are in the range of 1-12 m. This can be due to various reasons like ignoring noise and others which I have listed below.

Scope of error:

- Application was taking time in changing the value and sometimes, it was responding way slow . So some data can differ.
- I took my unit of measurement as one square tile whose dimensions was close to 57cm x 57cm. So, for larger distances, the error in distance can be more.