ns3 Simulations
EE5150 : Communication Networks

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EE14B127

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1 Exercise 1

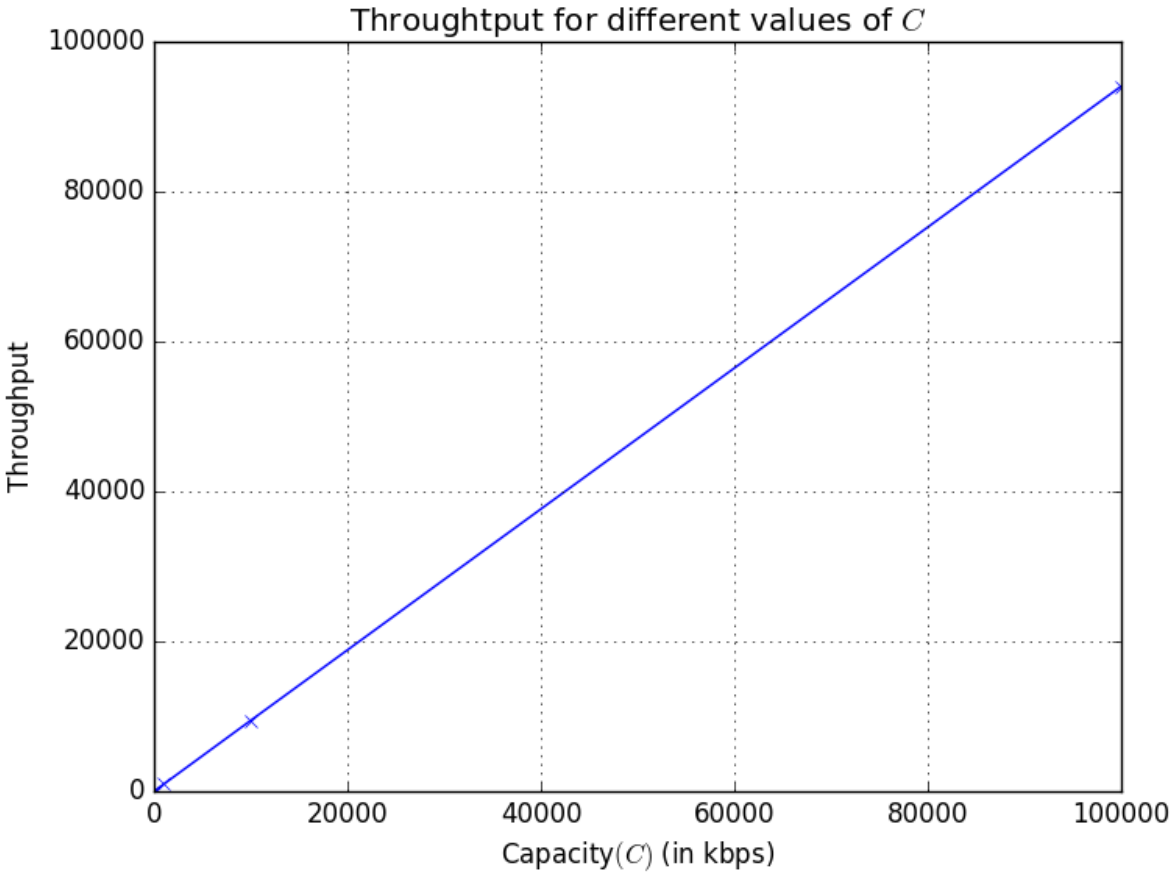
In this exercise we consider a single link with nodes n_0 and n_1 with a fixed capacity C and a propagation delay d. We consider a long lived TCP session transferring data from n_0 and n_1.

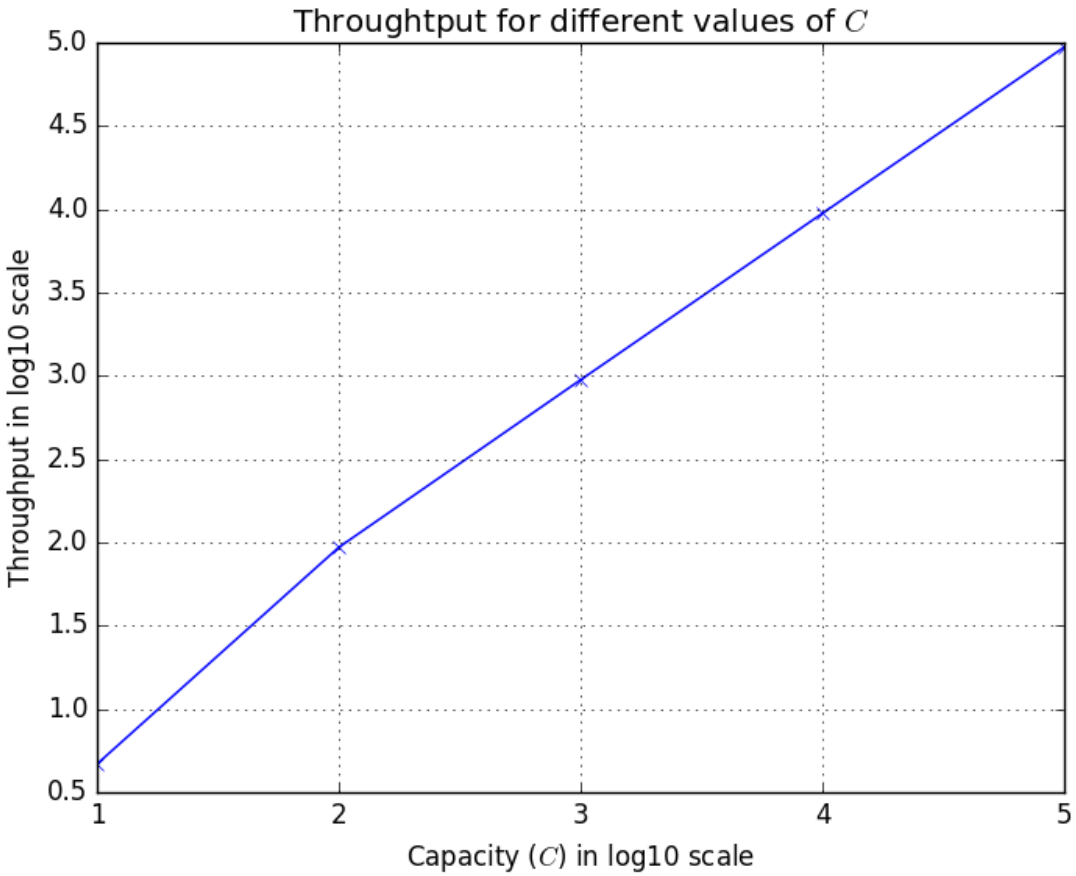
1.1 Part A

1.1.1 Question

Plot the average throughput of the TCP session for different values of the link capacity C. Assume $d = 5$ms and let the link (bit or frame) error rate be 0.

1.1.2 Solution



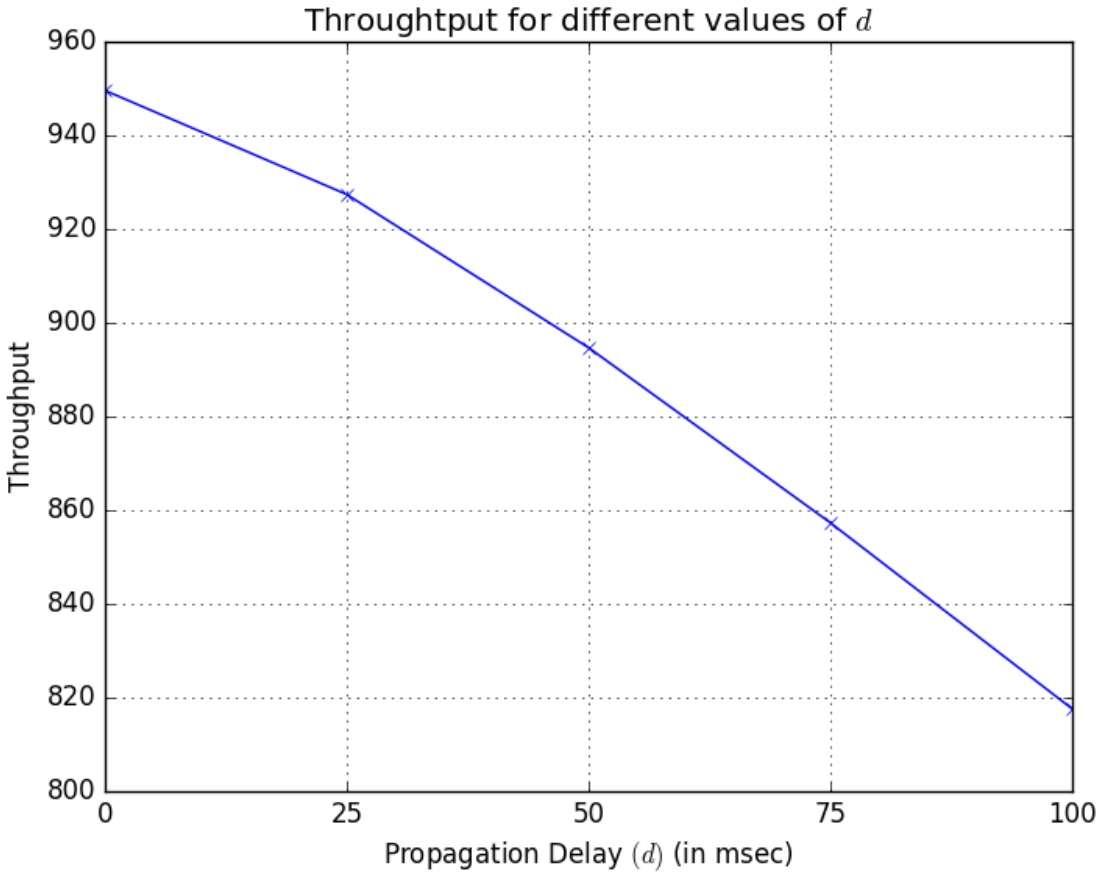


1.2 Part B

1.2.1 Question

Plot the average throughput of the TCP session for different values of the propagation delay d. Assume the $C = 1$Mbps and let the link (bit or frame) error rate be 0.

1.2.2 Solution

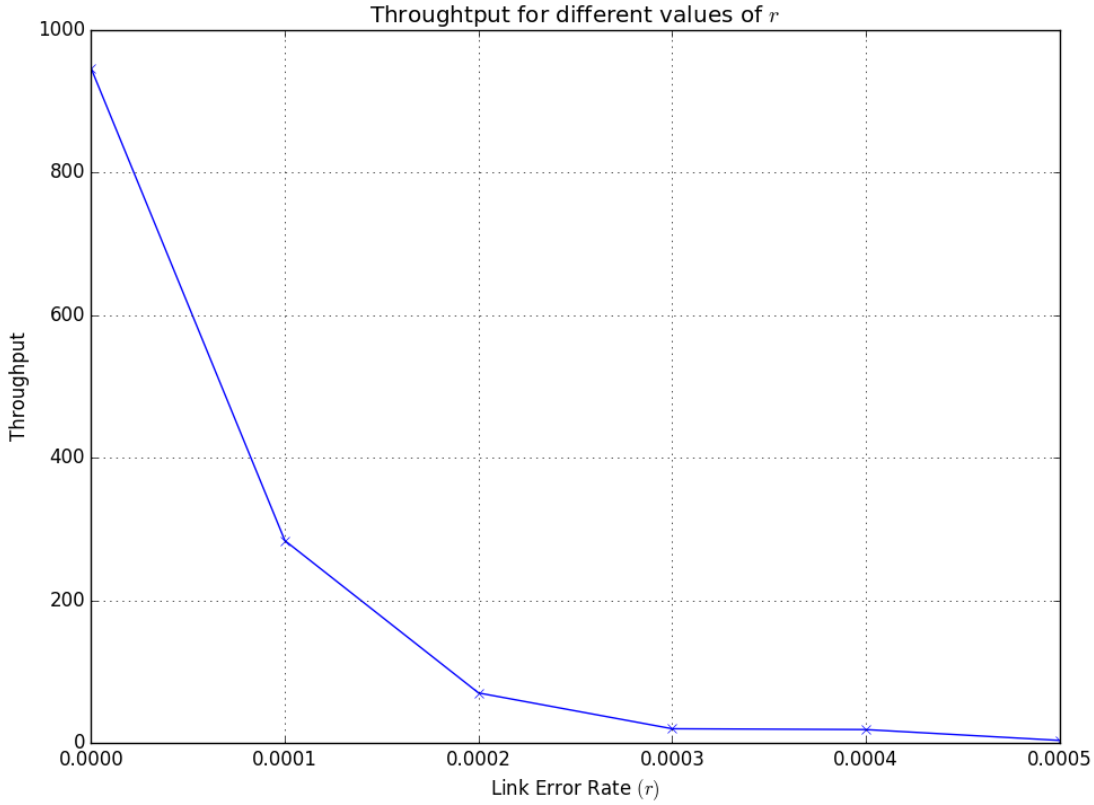


1.3 Part C

1.3.1 Question

Assume $C = 1$Mbps and $d = 5$ms. Enable the error rate model for the link (p2p channel and devices) in the simulation script. Plot the average throughput of the TCP session for different values of link error rate.

1.3.2 Solution

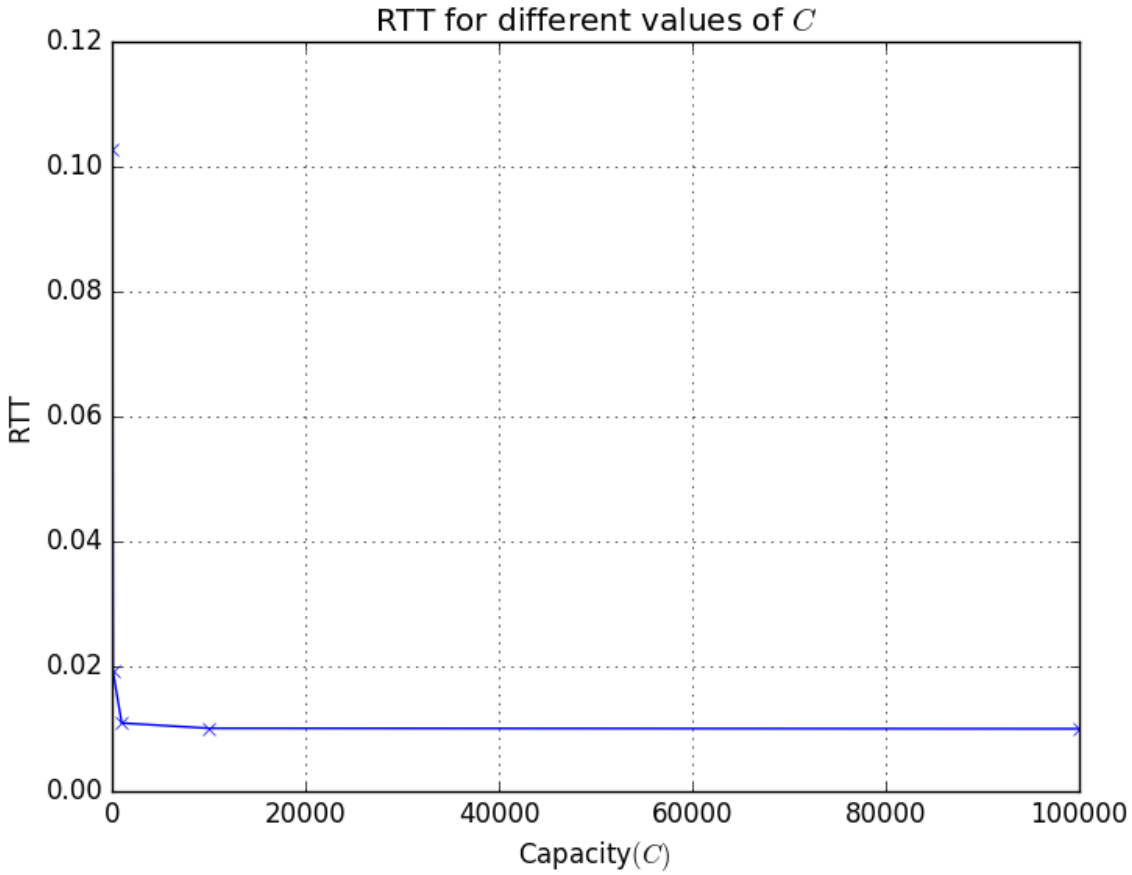


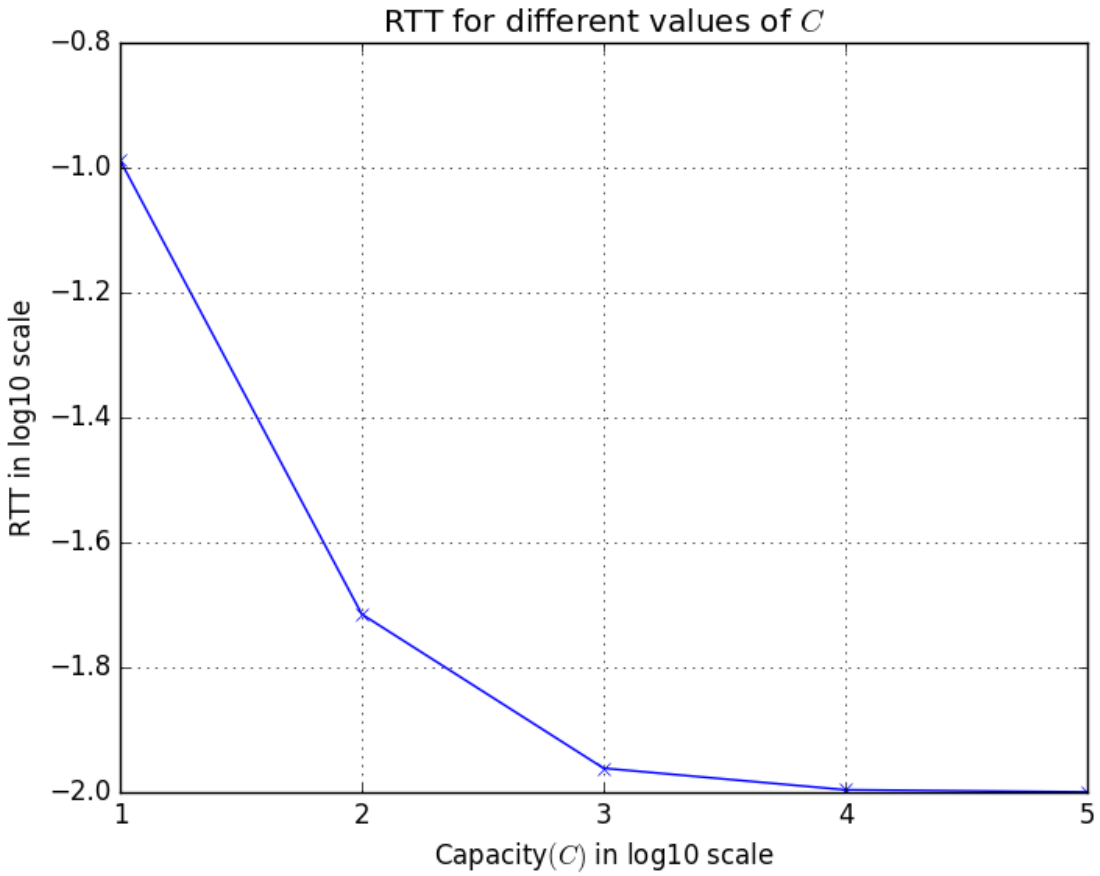
1.4 Part D

1.4.1 Question

Enable trace for the simulation and plot throughput and RTT(round trip time) of the packets from wireshark.

1.4.2 Solution





2 Exercise 2

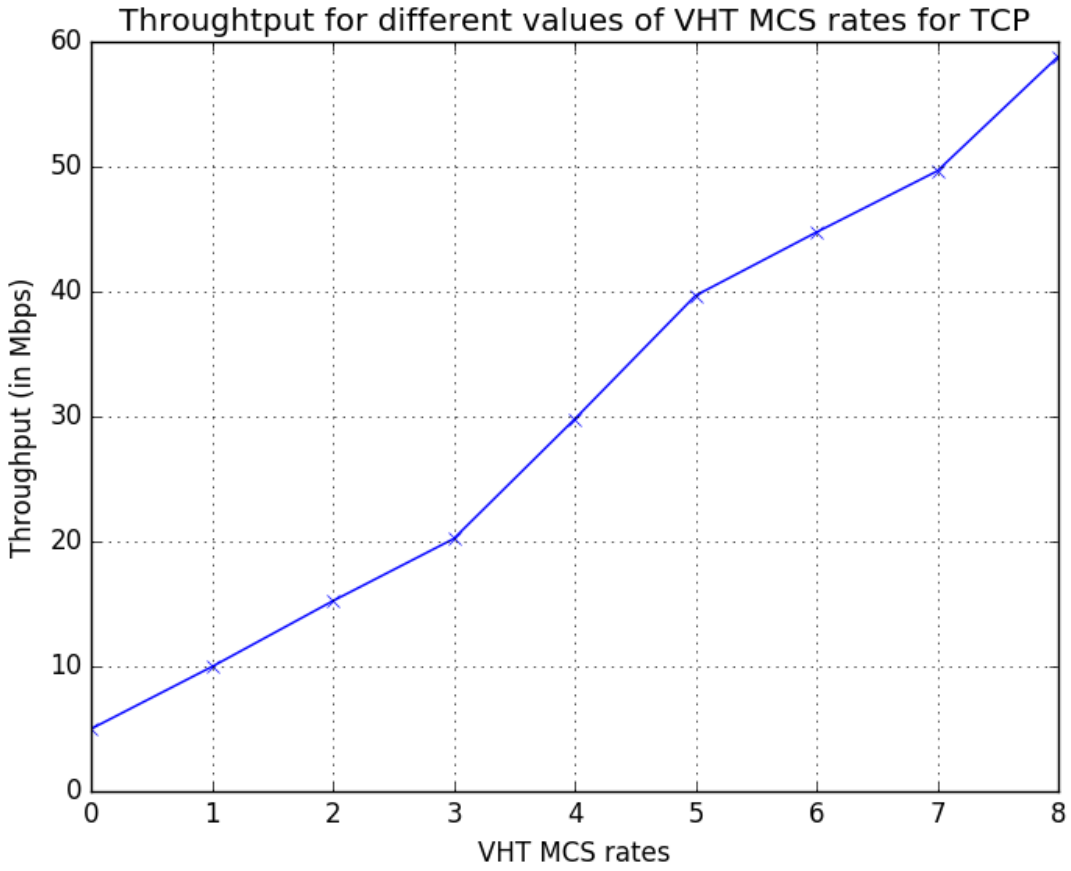
In this question, we consider two types of file transfers (UDP and TCP) from a server to a client over a wireless LAN. We consider a wired link between the server and the access point (of a fixed capacity and propagation delay) and an IEEE 802.11ac PHY/MAC between the access point and the client.

2.1 Part A

2.1.1 Question

Plot the average throughput of the TCP session for different values of VHT MCS rates (or indices).

2.1.2 Solution

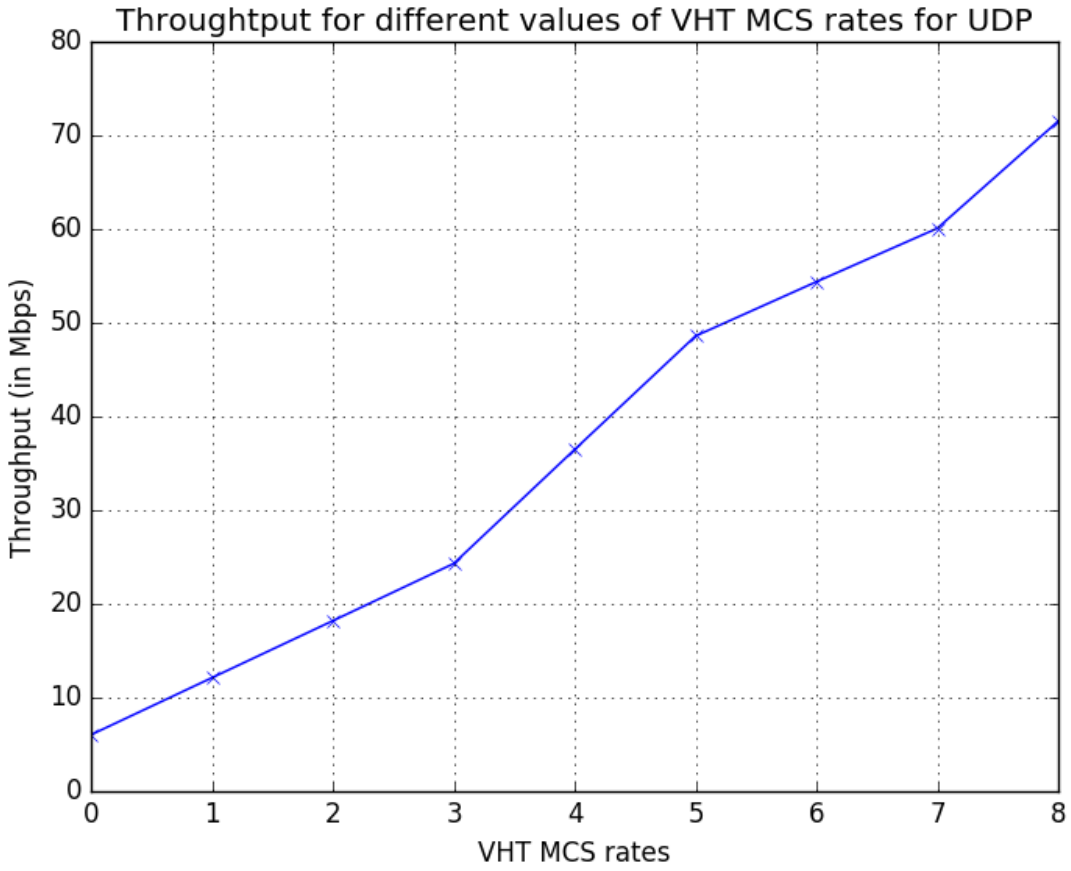


2.2 Part B

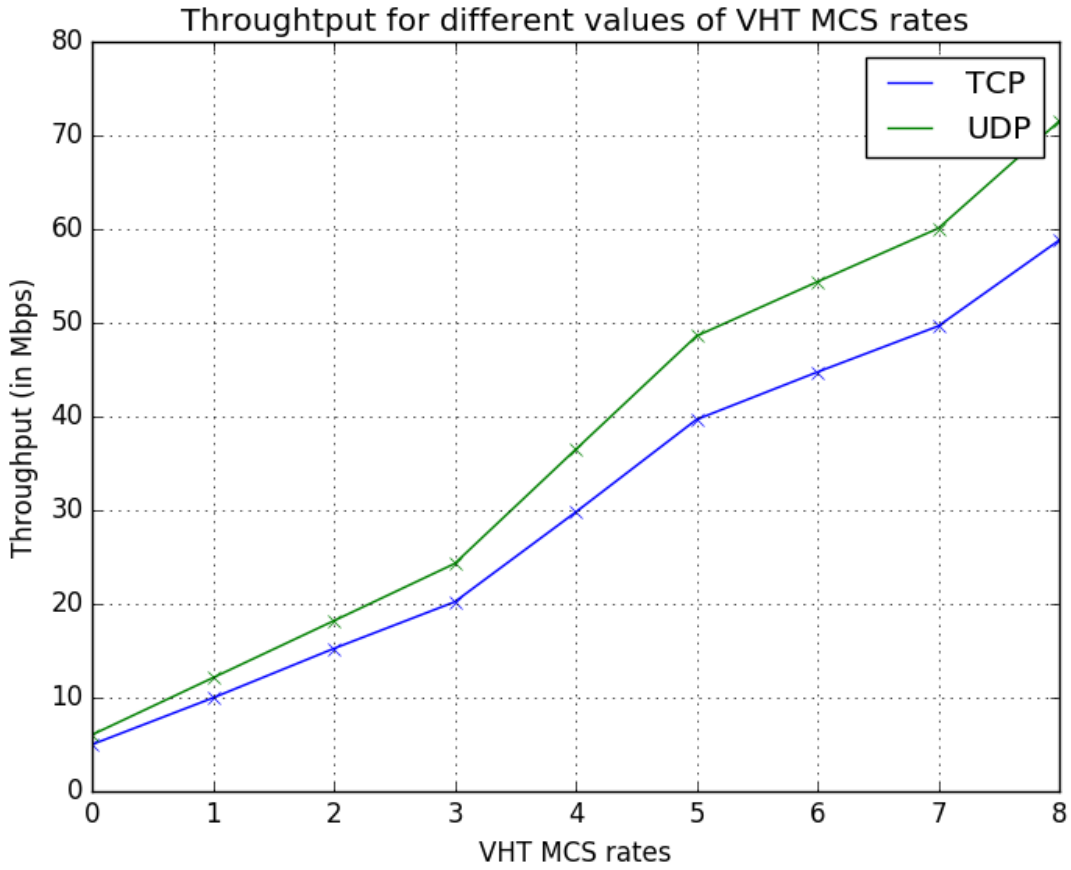
2.2.1 Question

Plot the average throughput of the UDP session for different values of VHT MCS rates (or indices).

2.2.2 Solution



2.3 Aside : Comparison of UDP and TCP File Transfers



2.4 Part C

2.4.1 Question

Plot the average throughput of the TCP session for different distance between the access point and the client.

2.4.2 Solution