Assignment 3
Wireless Networks

Create a network scenario where there are 10 stations connected to an AP over a 40MHz channel and with a guard interval of 3200ns. Stations use an MCS of 11 and are within a radius of 5m from the AP. MAC queue is of 6000 packets and the packet size is 1000 bytes. Take the simulation time as 10 seconds.

a) The stations do video conferencing with per STA data rate of 10Mbps. Compare the packet latency distribution (Application Layer) with both OFDM and OFDMA transmissions with 18 RUs for both DL and UL. Also compute the median TCP RTT and compare them for the above configurations. Identify which configuration (OFDMA/OFDM) wil providel better performance in terms of each metric and explain your answer.[5 + 2+ 3]

b) The STAs send HTTP requests and receive HTTP response with the following parameters:

Parameter	**Value**
Main Object Size	truncated LogNormal (21420) B
Embedded Object Size	truncated LogNormal (15516)
No. of Embedded Objects in a page	Uniform Random (90 to 110)
Reading Time	unbounded exponential (1)

Compare the average page load time and average latency for main object with both OFDM and OFDMA transmissions with 18 RUs and identify which configuration (OFDMA/OFDM) wil providel better performance and why. [5+ 3]

Hint: https://www.nsnam.org/docs/models/html/applications.html
https://www.nsnam.org/doxygen/dc/d86/three-gpp-http-example_8cc.html