ELEC-E7460 Modeling and Simulation, fall 2018
Assignment 3

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1   Dispatching Problem

Policy	Load	Mean	95% CI
Random	0.1	0.4443	0.441161, 0.447445
	0.3	0.56986	0.567934, 0.571783
	0.5	0.7982	0.794924, 0.801467
	0.6	1.0021	0.996013, 1.00817
	0.7	1.3288	1.32323, 1.33443
	0.8	1.9894	1.96546, 2.01337
JSQ	0.1	0.58661	0.584228, 0.589001
	0.3	0.6192	0.617762, 0.620643
	0.5	0.75729	0.755513, 0.759059
	0.6	0.88313	0.878981, 0.887284
	0.7	1.0843	1.08088, 1.08768
	0.8	1.4735	1.46413, 1.48292
W-JSQ	0.1	0.57069	0.568746, 0.572625
	0.3	0.54304	0.542137, 0.543945
	0.5	0.61113	0.609361, 0.612903
	0.6	0.70014	0.698524, 0.701751
	0.7	0.85885	0.854486, 0.863224
	0.8	1.1945	1.18841, 1.20059

Present your results in a table or a figure and compare them. You may also simulate more load points and plot the mean values in figure which may help the comparison. What do you observe and try to explain your observations? Which policy performs best/worst? How does the load affect?
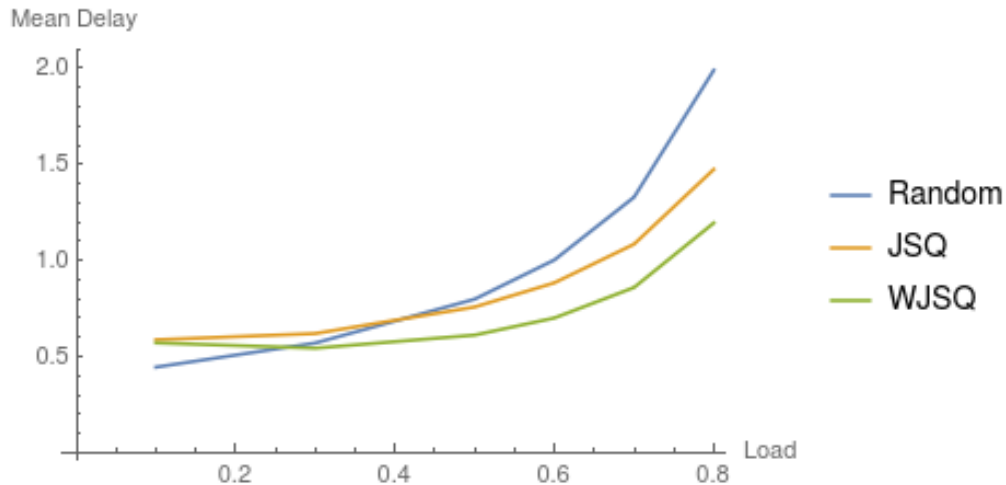
Ans.

– Random policy works the best when the load is low, however, as load increases, the performance degrades quickly. With a high load, the mean delay is much higher than the other policies

– With a low load, JSQ performs worst than Random, however performs better than Random when the load is higher.

– W-JSQ has similar performance to JSQ (starts of worst than Random but better with a higher load). With a high load, it performs better than JSQ. As such, W-JSQ can be seen as an improvement to JSQ.

Thus, we should have a dispatcher than dispatches the arrivals randomly when load is low, and switch to W-JSQ when the load is above a certain threshold.