CPSC531
Assignment3 Report

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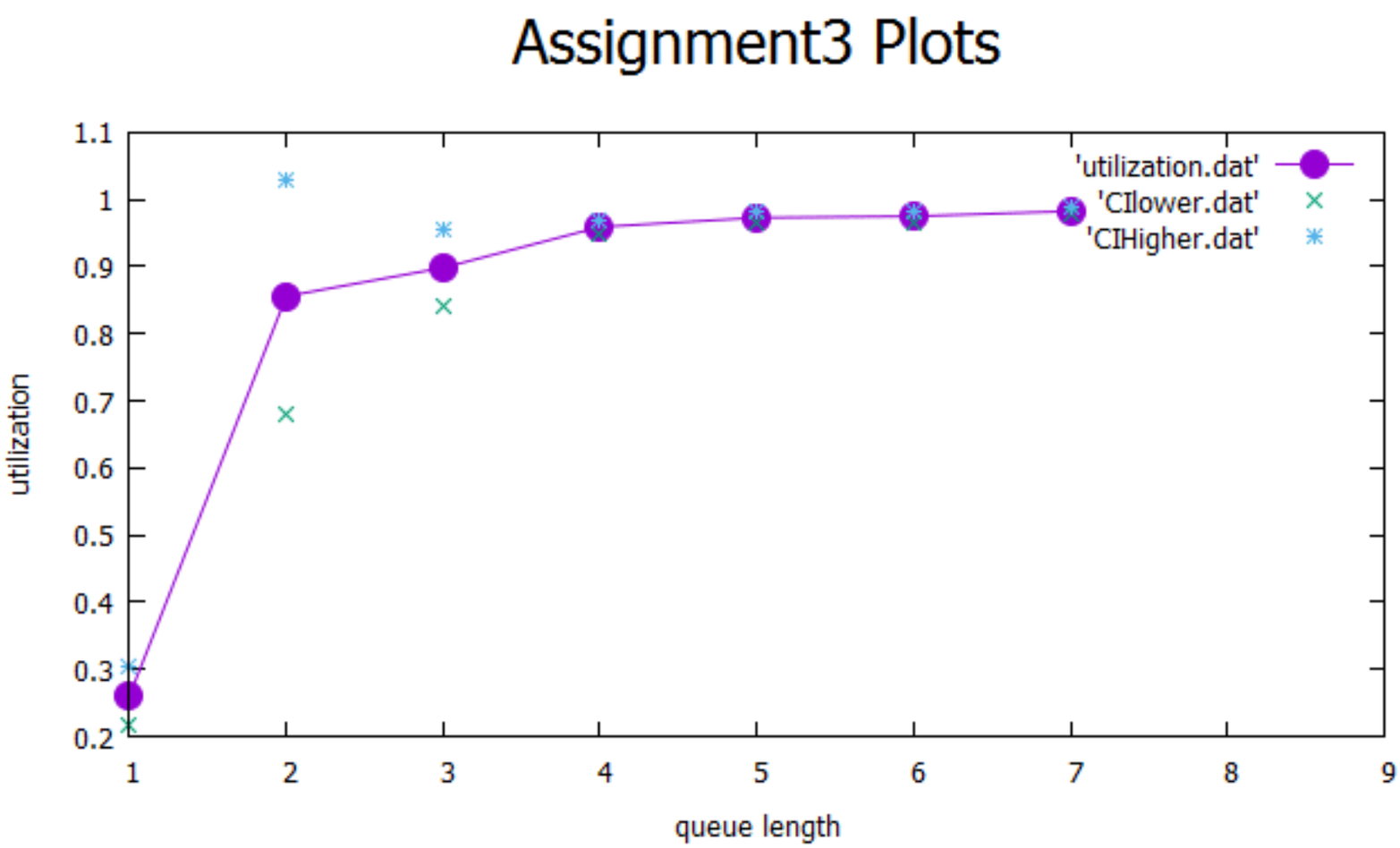
Part I



As shown in the plot, while queue length hits 7 and above 7, absolute improvement of chef utilization diminishes less than 0.5. Also, at the time the width of the confidence interval is smaller than 0.01. Since the number of arrival follows uniform distribution and n = 4 which means if the queue length is around 7, the queue will mostly be full and the chef will be busy most of the time.
In math: E(uniform) = (7+1)/2 = 4 which is equal to queue length.
Selected xRange to 9 just to make sure the plot takes 3/4 of the graph.

Part II

- Random number streams: I used RngStream which Dr.Ghaderi showed us for assignment 2. I initialized the init 3 RngStream object(arrival,patience,uniform) with seed. And called different times of resetNextSubstream function to generate different sub stream from the origin random stream. In addition, I used Random class their nextGaussian() to generate normal distribution random variate for chef service time.
    - Link: http://www.iro.umontreal.ca/~lecuyer/myftp/streams00/java/RngStream.pdf

- I picked 10000 as the time runs for the simulation. Both the number of runs it takes when the absolute improvement of utilization is less than 5% and the number of runs it takes when the confidence interval is less than 1% stable. Ps, I tried 2000 which gives the same output.

- According to formula slide40/41 to compute the number of simulation runs. We have m* = (2*7*0.95/0.1) , the result is close to 7. Thus, we ran our simulation 7 times which fits the maths.