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Large and Social Networks

Project 3 Report

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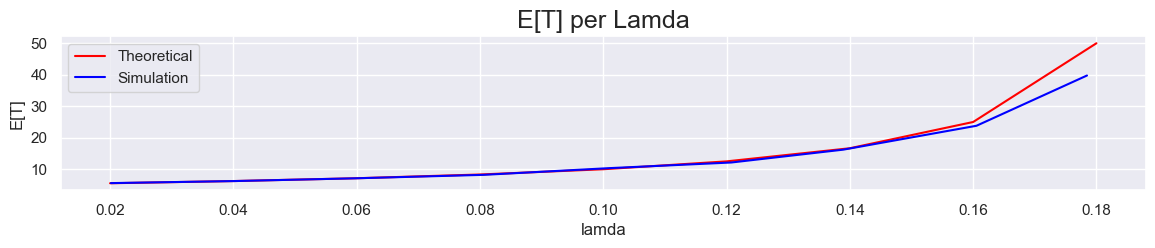
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1. M/M/1 Queue Simulation:

At first we simulated an M/M/1 queue.

To find the theoretical E[T] (response times) for each lamda the below equation was used:

After simulating 15000 jobs the following plot occurred:



We can see that the simulation values are almost the same with the theoretical ones until the system becomes heavily loaded (lamda >= 0.16). Then the simulation values start to deviate from the theoretical ones, by a small margin.

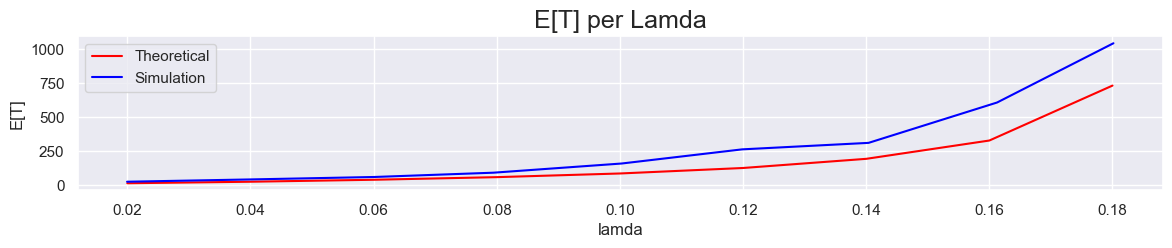
1. M/G/1 FCFS Queue Simulation:

In order to find the theoretical E[T] for the M/G/1 system the below equation was used:

Where:

And:

The simulation seems to converge for n = 50.000 jobs. After running it we get the following plot:



Simulation values seem to converge with the theoretical ones until lamda >= 0.1. Then they start to deviate from the theoretical ones, at first by a small margin and then, when the system is heavily loaded, by a bigger one.

This may happen because in theory there is exact 98% of a small job occurring and 2% of a large one occurring but in reality, there may be 97% of small jobs and 3% of bigger ones, congesting the system more than we expected.