Random number generation

Consider a server, that executes jobs individually, in order of arrival and without interruption. Jobs arrives and are served according to the following inter-arrival time and service time distribution:

- Arrivals: an hyper-exponential distribution with two stages, characterized by $(\lambda_1 = 0.1, \lambda_2 = 0.05, p_1 = 0.5)$
- Service: an hypo-exponential distribution with two stages characterized by $(\lambda_1 = 0.1, \lambda_2 = 0.5)$

Generate the arrival and completion curves, and compute the 95% confidence intervals of the system average service time (R), average number of jobs (N), utilization (U) and throughput (X). Consider at least N = 10000 jobs, with K = 50 runs of M = 200 jobs each.

OPTIONAL[*]

For the average response time, compare the results that can be obtained considering either a single run with N = 10000 jobs, or K = 50 runs of M = 200 jobs each.

[*] Optional parts are useful to challenge your understanding of the topic. You are encouraged to do them, but they will not asked during the exam