Project 3 – Quick checkout

A supermarket has n tills. Two policies can be enforced for checkout:

    a) Undistinguished tills: any customer can check out at any till.
    b) Quick-checkout tills: a percentage p of tills is reserved for customers whose shopping cart holds less than k items (k being the *quick-checkout threshold*).

In both cases, a customer queues up at the till with the smallest queue among those where (s)he is allowed to queue. Consider the following workload: customer inter-arrival times are IID RVs (to be described later), their service demands (i.e., checkout times) are IID RV (to be described later). The percentage of quick-checkout tills can be varied (but stays constant in a single simulation), and so does k.

Compare the queueing and response time of the two options under a varying workload. More in detail, at least the following scenarios must be evaluated:

    - Exponential distribution of interarrival times and service demands.
    - Lognormal distribution of service demands.

In all cases, it is up to the team to calibrate the scenarios so that meaningful results are obtained.

Project deliverables:

    a) Documentation (according to the standards set during the lectures)
    b) Simulator code
    c) Presentation (up to 10 slides maximum)