Airport check-in time estimation

The check-in of an airport consists of 6 parallel desks. For a departure, 140 passengers have tickets, the inter-arrival times of the passengers to the check-in follow an exponential distribution so that the expected number of incoming passengers in an hour is 100.

At the check-in, passengers are put in one queue and guided from it to the desk that is first free. The service time of each desk is between 1 and 5 minutes. Suppose that the first passengers start arriving to the check-in at the same time as the desks are opened.

The question is "How much time before the departure the check-in should be opened, so that all passengers get served 20 minutes before the departure?".

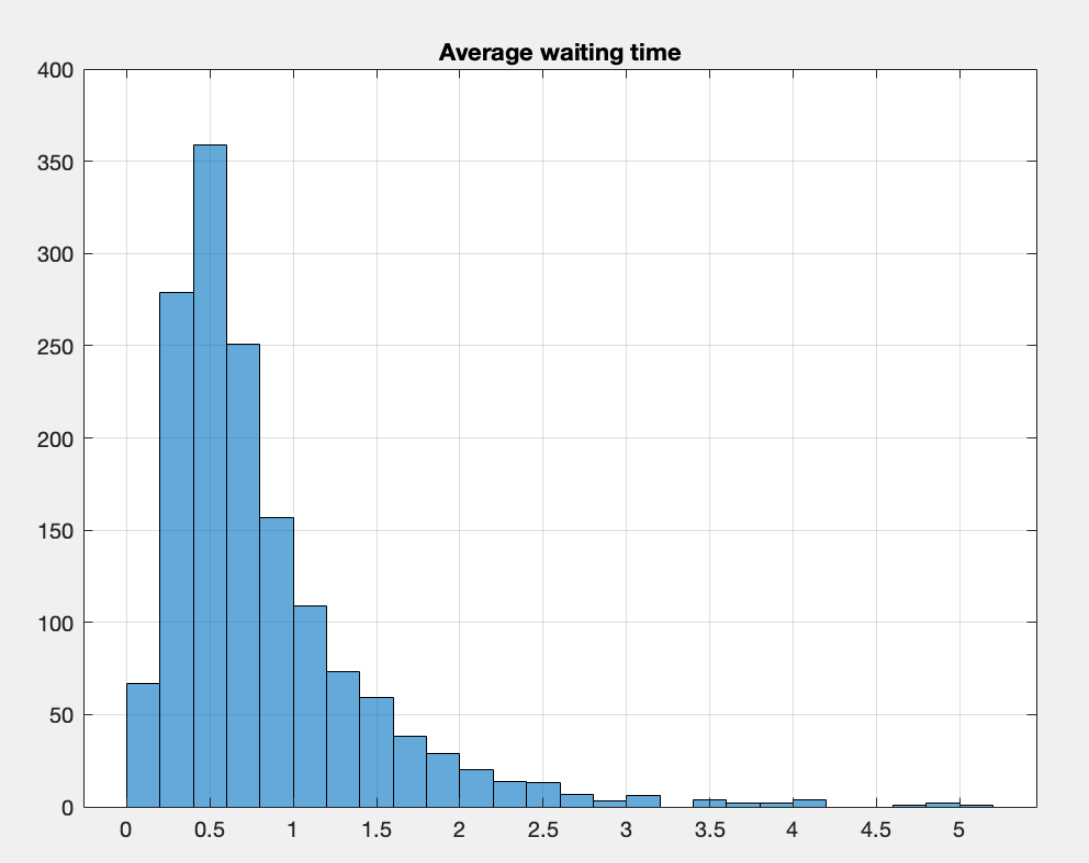
To solve this problem, we run the simulation process with 1500 iterations, written in ***Matlab*** program.

After the simulation, the ***maximum time*** when check-in desks have served all the passengers and can be closed is ***1.67 hour***.

So, addition to 20 minutes the passengers get served, ***the total time before departure the check-in should be open*** is 1.67 hour + 20 minutes = 2.01 ~ ***2 hours***.

The following draft shows the average waiting time of passengers of 1500 iterations. 0.5 hour (= 30 minutes) is the most frequent waiting time of passengers.

The code lines are provided in Matlab file ***(.m)*** of this folder.


Average waiting time
400
350
300
250
200
150
100
50
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5