Simulation Engineering - Homework 1

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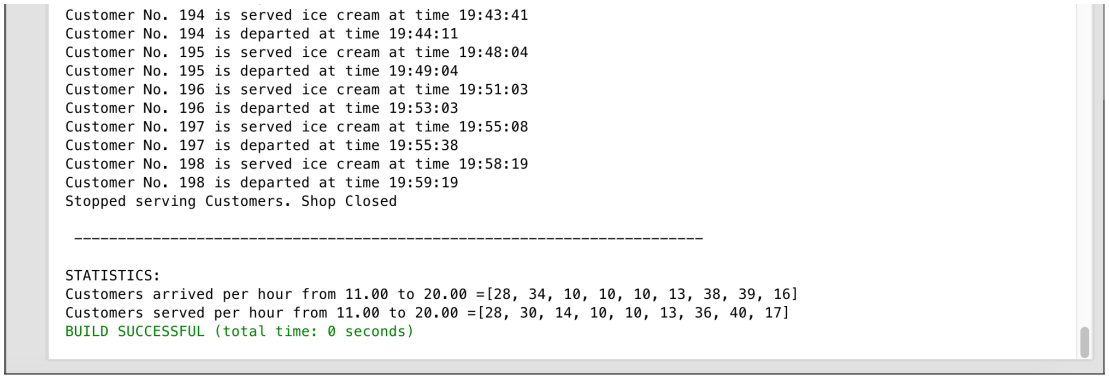
Ice Cream Shop Simulation

1. How does the queue changes over the day?

   Answer Refer to Figure 1. We can see that 198 customers arrive and are served through the day. Hourly statistics can also be observed from the figure. We can see that 28 customers arrive during 11:00 to 12:00, 34 customers arrive from 12:00 to 13:00, and so on.



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Customer No. 194 is served ice cream at time 19:43:41
Customer No. 194 is departed at time 19:44:11
Customer No. 195 is served ice cream at time 19:48:04
Customer No. 195 is departed at time 19:49:04
Customer No. 196 is served ice cream at time 19:51:03
Customer No. 196 is departed at time 19:53:03
Customer No. 197 is served ice cream at time 19:55:08
Customer No. 197 is departed at time 19:55:38
Customer No. 198 is served ice cream at time 19:58:19
Customer No. 198 is departed at time 19:59:19
Stopped serving Customers. Shop Closed

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STATISTICS:
Customers arrived per hour from 11.00 to 20.00 =[28, 34, 10, 10, 10, 13, 38, 39, 16]
Customers served per hour from 11.00 to 20.00 =[28, 30, 14, 10, 10, 13, 36, 40, 17]
BUILD SUCCESSFUL (total time: 0 seconds)
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Figure 1: Customers Arrived and Served per hour from 11:00 to 20:00

2. Does Mike need to employ somebody else?

   Answer Refer to Figure 1 again. We can see that Mike (Server) lags a bit behind when serving customers from 12:00 to 13:00 and from 17:00 to 18:00. For the lag of 4 persons between 12:00 to 13:00 he makes up by serving them in the next hour and for the lag of 2 persons from 17:00 to 18:00 he makes up by serving them in the next two hours.

3. Full time or part time

   Answer In the current scenario, Mike would not benefit much even by employing another serving part-time in the peak hour which is 12:00 to 13:00 in our case (as per week 3 slides) as he can make up for the lag in serving customers himself. However, by changing customer frequency, the number of customer scoop preference or/and the serving time for each scoop, the scenario will change and then it might be useful to assess again whether to have another server working full-time or part-time.