Programming Task - Ruby

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Queuing Simulation

Create a simple program that simulates how a virtual queue feeds into a call center queue. Create 2 queues, a virtual queue, and a call center queue. See Figure 1 for a visualization of the virtual waiting process.

Part 1
Call Center Queue

- callers line up into the call center queue randomly at a certain rate, e.g. 100 calls / hour
- a fixed number of Agents (e.g. 50) serves the callers in the queue
- the length of each call varies randomly from 2 to 20 minutes
- after each time step, calculate the approximate average current waiting time and the average current serve time

Part 2
Virtual Queue

- callers line up randomly at a certain rate
- when lining up, a timer is set for the caller that is equal to the larger of
  - the current waiting time in the call center queue
  - the remaining waiting time of the last caller that lined up, plus the average serve time
- when the timer is up, the caller is served by the next available agent

average current waiting time == the average time it takes for a caller, from the time they call until transferred to an agent

average current serve time == average time between when a caller is transferred until the next caller is transferred

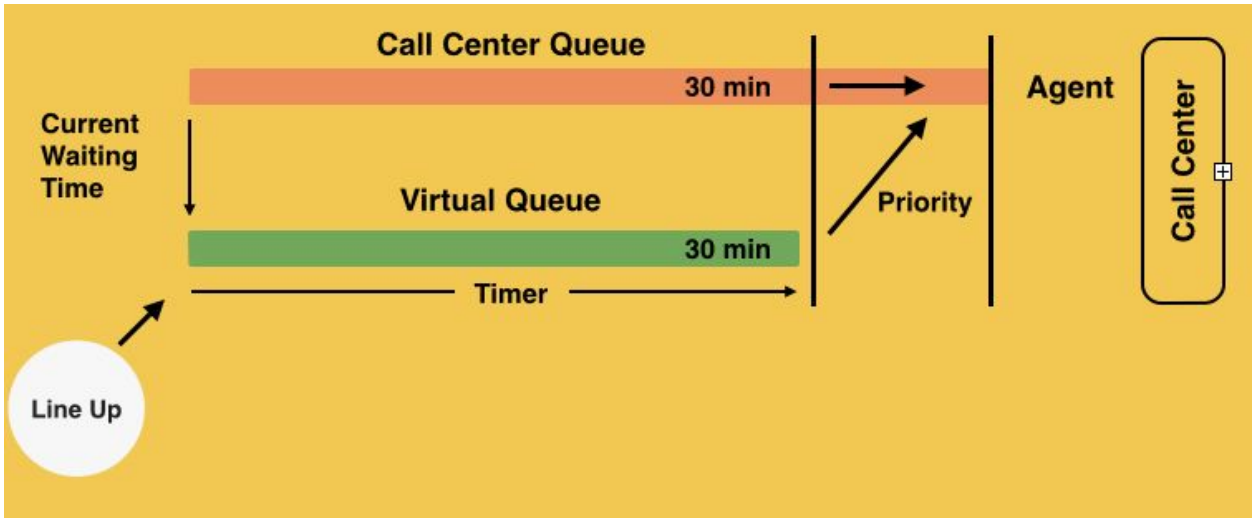

Figure 1: virtual waiting process

Suggestions on how to create the simulation

- initialize the simulation by creating the callers, queues, and agents
- create a loop using an integer for each time step. For example to simulate 120 minutes, the loop could run from 0 to 120
- for each time step, update all parties:
    - check all agents if they are currently on a call
        - if not, take the next caller out of the queue and set a timer for the call
        - if yes, check if time is up, if time is up, close the call
    - add new callers to the queue if there are any
    - update time averages and other tallies
- go to next time step

Optional Tasks

- vary the rate of new callers
- vary the number of agents
- graph the waiting times over the rate of callers

Unit-Test your code using a test suite of your choice. Add comments to your code as needed. Have fun! ;)