Simulation of a multi-server queuing system – Activity Instructions

Get into 18 groups. Mostly groups of 4, but some teams of 3 are OK.

Nominate 1 person in your group to be part of the model.

Students modeling the *customer*:

1. Each student will pick a card with the arrival time and the service time.
2. Students will stand in line based on the ID (order of arrival).
3. Students walk to the queue (arrival) based on their own arrival time – reference the timer (from 0 to 8 minutes maximum)
4. Students wait in the queue until any server becomes available, hand the note card to the service person. Stay with the server until the service person lets you know that your order is finished.
5. Leave the server, walk to the delay area for an additional 30 seconds
6. Leave the system.

Students modeling the *server*:

1. Collect the note card from the customer. Announce the time service starts.
2. Hold the customer for the service time. Announce the time service ends and let the customer leave the server.

We will do a practice round with four participants and one server.

Students Collecting Data:

1. Record the time each customer enters the system (Arrival Time)
   1. You should also include the color of their card. This will help you track the customer through the system. The pattern is Pink-Green-Yellow-Orange
2. Record the time each customer enters service and which server they enter.
   1. The server will hold the card above their head so you can see the customer ID and color.
3. Record the time the customer leaves service
4. Record the time the customer leaves the system

Calculate: If you were involved in the model you should get with your original group to do this.

* The average time in the system of all customers who make it through the system.
* Who had to wait in the system and their IDs.
* The average wait time of all customers who made it through the queue.

Rules:

* When a customer arrives to the system they should call out their number and color and arrival time
* If both servers are available the customer will choose server 1
* When a server is busy they should hold up the card over their head to indicate the ID of the customer in service.
* If you are collecting data sit with others to work together to get all the data points:
  + EX: 1 person collect arrival and departure time, 1 person focusing server 1, 1 person focusing on server 2