Progress Report

Simulation of Queuing system in an Amusement park

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This was our initial plan:

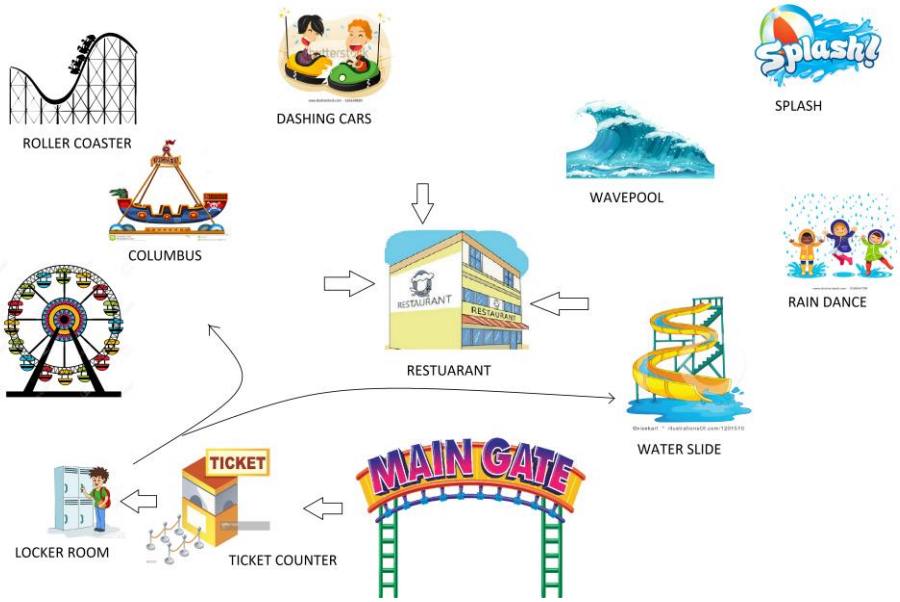
Work Schedule	
Oct. 1 – Oct. 15	Learn basics of Arena
Oct. 16 – Oct. 31	Build simulation model
Nov.1 – Nov.15	Possible extensions to the model
Nov. 16- Nov. 30	Prepare final report and presentation

We have managed to learn the basics of Arena and we are in the process of building the simulation model of an Amusement park.

The specifics of the model are detailed below:

1. The amusement park is assumed to have working hours from 8 am to 6 pm daily.
2. People entering the main entrance go straight to the ticket counter. The number of counters varies by the day of the week.
    a. People getting tickets are classified into two age groups (i) Young group and (ii) Old group.
3. Next, they go to the locker where there is a specified delay. Following this, people can decide where they want to go among the N rides. These rides are categorized into land and water rides, each of which has its own probability in addition to the probability for each category.
4. Logic behind choosing the rides:
    a. First the category is chosen, either land rides or water rides. Probability of choosing the category is different for different age groups, but is the same within one group
    b. Next the rides are chosen based on two important factors: probability of choosing individual rides and the queue length. Probability of individual rides is different for different age groups, but is the same within one group.
    c. After a person finishes one ride, we are changing the probability of that person going back to that ride to a different value as compared to the initial value that ride was assigned with. This ensures that the person can go back to the same ride multiple times.
    d. There is another resource named Restaurant which is open the entire duration of the amusement park. The arrival rate at the restaurant is a function of time.
5. We are trying out different arrival rates against different ride times to see which combination gives the least average waiting time of people. Attached below is the layout of our Amusement Park

Layout:


ROLLER COASTER
DASHING CARS
SPLASH
WAVEPOOL
COLUMBUS
RAIN DANCE
RESTAURANT
RESTUARANT
WATER SLIDE
LOCKER ROOM
TICKET
TICKET COUNTER
MAIN GATE