PROJECT 1 CONCEPT SKETCH

Probability #1 — from class schedule
Rate #1 changes
Probability #2 — fixed per person for if they leave
{Line} ? logic // {food court}
{swiping in}

Here we go! The goal of this activity is to generate a set of coherent, feasible ideas for Project 1. Working with your project **partner(s)**, generate ideas for each of the four boxes below. Then select or refine these ideas to develop a single "concept sketch" by filling in the boxes. If you would like to develop multiple ideas, extra handouts are available — please feel free!

1 Question

What is the motivating question? Capture it as concisely as you can.

When can you get access to lunch fastest @ the Olin Dining Hall?

↳ measured in average time before swiping
↳ potentially average time to go through the stations

2 Model

How can a model help you answer the question? What are the key elements of the model (e.g., state, actions, parameters, metrics)?

exponential distribution followed by ⇒

Parameters:
- probability of entering line at a given time based on class schedule
- total students trying to eat lunch @ Olin
- maximum rate of swiping in (input rate) ✳
- probability of being done getting food (per person)
- maximum number of people getting food at the same time

variables: real rate of swiping in

data-based:
- how much real rate changes w/ ppl in food court
- ✳ input rate of swiping in

metrics: how long the average person waited in line by their start time waiting
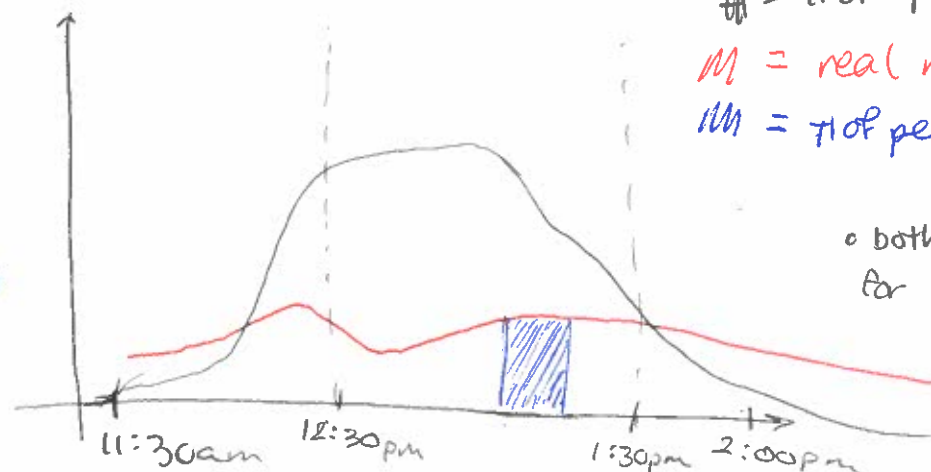
3 Results

What does an answer to the question look like? What output would you expect the model to produce? Draw at least one graph — be sure to label the axes.

\# = # of people in line
M = real rate of entering (in people/time)
$\text{M} = \text{\# of people in the food court} = \int \text{MM} \, dt$

- both results in average wait time for line, within food court, and total combined time until sitting down and eating

4 Interpretation

Why would the results answer the question? What implications might they have in the real world? Why should people care?

- results would inform us of general trends as well as the actual wait times
  ↳ shows difference between congestion & business
- People care b/c people don't like waiting in line
- Implication of Lilo & I getting our lunches super-quickly, and knowing when to be prepared for a long wait

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