**Discussion 5: Concurrency**

**Concurrency**

1. CS10 has decided to open a pizzeria! To make a pizza, the following tasks must be completed:

<table>
<thead>
<tr>
<th>Task</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make the dough</td>
<td>25 min</td>
</tr>
<tr>
<td>Make the sauce</td>
<td>25 min</td>
</tr>
<tr>
<td>Prepare the toppings</td>
<td>10 min</td>
</tr>
<tr>
<td>Assemble the pizza</td>
<td>10 min</td>
</tr>
<tr>
<td>Bake the pizza</td>
<td>50 min</td>
</tr>
</tbody>
</table>

a. Which of these tasks must be completed in serial?

Assemble pizza, bake the pizza

b. Which of these tasks can be completed in parallel?

Make the dough, make the sauce, prepare toppings

c. Based on Amdahl’s Law, how fast can we make a single pizza?

1 hour and 25 minutes in real life (theoretically 1 hour)

d. How many employees would the pizzeria need to make a pizza this fast?

3 (theoretically infinity)

2. Assume we click the green flag to run the code below, then wait 60 seconds. What are all the possible values of `magic` after 60 seconds have elapsed?

Possible values of `magic`: X. The code gets caught in a deadlock.
3. Which of the following could be the value of `my_name` after the green flag is clicked?

- Dan Garcia
- Dan Bear Garcia
- Garcia Oski Dan Bear
- Dan Bear Oski Garcia
- Dan Oski Bear
- Dan Oski Bear Garcia

Challenge

1. List all possible values of `grade` after the green flag is clicked.

Possible values of `grade`: 225, 150, 105, 195