

Discussion 5: Concurrency

Concurrency

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

Task	Time
Make the dough	25 minutes
Make the sauce	25 minutes
Prepare the toppings	10 minutes
Assemble the pizza	10 minutes
Bake the pizza	50 minutes

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?

```

when clicked
  set magic to X
  broadcast Magic Show
  
```

```

when I receive Magic Show
  wait pick random 1 to 5 secs
  repeat until magic = A or magic = B
  broadcast Magic Show
  set magic to C
  
```

```

when I receive Magic Show
  wait pick random 1 to 5 secs
  repeat until magic = B or magic = C
  broadcast Magic Show
  set magic to A
  
```

```

when I receive Magic Show
  wait pick random 1 to 5 secs
  repeat until magic = A or magic = C
  broadcast Magic Show
  set magic to B
  
```

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?

```

when clicked
wait pick random 1 to 3 secs
set my name to Dan
wait pick random 1 to 3 secs
set my name to join my name Oski
  
```

```

when clicked
wait pick random 1 to 3 secs
set my name to Garcia
wait pick random 1 to 3 secs
set my name to join my name Bear
  
```

- Dan
- Garcia
- Dan Bear
- Garcia Oski
- Dan BearOski
- Garcia Dan
- Oski
- Dan OskiBear

Challenge

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

```

when clicked
set Grade to 10
broadcast Apply Final Grading
  
```

```

when I receive Apply Final Grading
Apply EPA Get Grade - 5
  
```

```

when I receive Apply Final Grading
set Grade to Get Grade x Get Grade
  
```

Here are the definitions of the blocks used in the above scripts:

```

+ Apply + EPA + points +
wait pick random 1 to 10 secs
change Grade by points
  
```

```

+ Get + Grade +
wait pick random 1 to 5 secs
report Grade
  
```

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