

## 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?  
\_\_\_\_\_

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

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

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

e. Would adding an employee to your answer from part (d) change the time it takes to make a pizza?  
\_\_\_\_\_

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`: \_\_\_\_\_

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

### Testing

The following questions are based off this block:

```

+square+numbers+in+ list +
script variables new
set new to list
for i = 1 to length of new
  replace item i of new with item i of new x item i of new
report new
  
```

1. We try to test our code, but we get an error. What does it mean and how can we fix it?

```

test square numbers in w/ inputs list 1 2 expecting output
list 1 4
  
```

Inside: Error expecting list but getting number

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2. Now, we try to run the following test, but it doesn't work as expected:

```

set my list to list 1 2
test square numbers in w/ inputs
report list my list list my list expecting output
list 1 4 list 1 4
  
```



Why does it output this, and how could we fix it?

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- Assuming we haven't changed the code for square numbers, what should we expect this block to output? Is it any different from the output from part 2?

```

test square numbers in [ ] w/ inputs
list list 1 2 <<>> list list 1 2 <<>> expecting output
list 1 4 <<>> list 1 4 <<>>
  
```

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### Challenge

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

```

when green flag 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 :