CIS 122

Throwing you for a loop
fractalTree(depth, trunkLength, angle1=60, angle2=20)
Put it in reverse

- Yesterday, we tried to reverse a string
  - Instantiate a new string
  - Loop through each character in the old string
  - Add each one to the new string

```python
def reverse(string):
    rev = ''
    for char in string:
        rev = rev + char
    return rev
```

- This just gives us our old string back...
Put it in reverse

• Yesterday, we tried to reverse a string
  ○ Instantiate a new string
  ○ Loop through each character in the old string
  ○ Add each one to the new string

```python
def reverse(string):
    rev = ''
    for char in string:
        rev = char + rev
    return rev
```

• That's better!
Put it in reverse

- Accumulator Pattern
  - Initialize a variable
  - Loop through a sequence, modifying that variable
  - When we're done, we've got some useful value

```python
def reverse(string):
    rev = ''
    for char in string:
        rev = char + rev
    return rev
```
Put it in reverse

- Accumulator Pattern
  - Initialize a variable
  - Loop through a sequence, modifying that variable
  - When we're done, we've got some useful value

- What happens if we initialize our variable inside our loop?

```python
def reverse(string):
    for char in string:
        rev = ''
        rev = char + rev
    return rev
```
Let's write a max function
  ○ Given a list of numbers, return the largest
  ○ Generalization from assignment 1

How would we approach this problem?
Let's write a max function
  ○ Given a list of numbers, return the largest
  ○ Generalization from assignment 1

How would we approach this problem?
  ○ Instantiate a max variable
  ○ Loop through elements in list, updating max when we can
  ○ When we're done, we must have the largest value

Give it a shot
  ○ Work with the students in your row
While Loops

● Avoid using break statements when you can
  ○ Tend to make code less clear
  ○ A good loop condition is far more readable

● If you use break statements, comment them well

```python
x = 0
while x < 10:
    print x
    x = x + 1
```

```python
x = 0
while True:
    print x
    x = x + 1
    if x == 10:
        break
```
While Loop Practice

- Implement \texttt{collatz(x)} using a while loop
  - How many times do we need to perform HOTPO on x before it reaches 1?

- How could we use a while loop to solve this problem?
While Loop Practice

- Implement `collatz(x)` using a while loop
  - How many times do we need to perform HOTPO on x before it reaches 1?

- How could we use a while loop to solve this problem?
  - Initialize a counter to 0
  - While x hasn't reached 1...
    - Apply HOTPO to x
    - Increment counter

- Go do it!
  - Work with the students in your row