More Exercises with Loops

CS 8: Introduction to Computer Science, Spring 2019
Lecture #8

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Administrative

- Hw04 – due next week
- Lab02 – due on Sunday by midnight (11:59 pm) on **Gradescope**!
- **Midterm Exam #1 is NEXT WEEK on Wed., May 2nd**
  - I'll put up sample problems after Wed. this week

Midterm #1 Exam

- **May 2nd, 2:00 – 3:15 PM** in **THIS** classroom (unless you are a DSP student)
- Come **10 MINUTES EARLY** as there might be **pre-assigned seating**
- **CLOSED BOOK!** But you can bring **1 page of notes**
  - Single-side only, 8.5” x 11”
  - Hand-written *or* computer printed is OK!
  - Must turn it in *with the exam* when done
  - No calculators / cell phones / any type of computer
- Bring your **UCSB ID** with you. **NO EXCEPTIONS**.

Midterm #1 Exam

WHAT'S ON IT?!

- **Everything**
  - Review ALL lectures
  - Review ALL readings
  - Review ALL labs
  - Review ALL homework

Midterm #1 Exam

SAMPLE QUESTIONS?!?!?!?!?!?!

- Yes! See Study Guide on the class website!

Lecture Outline

- More exercise with loops using **for** and **while**

Exercise 1

- What will this code do?

```
for p in range(6, 25, 6):
    if p % 12 == 0:
        print("X", end="")
    else:
        print("O", end="")
```

Exercise 2

- What will this code do?

```
sum = 0
count = 0
while (count < 10):
    if count in (3, 8):
        print(count/2)
    count += 1
    sum += count
print(count, sum, sep=", ")
```

Class Exercise

Get together with 2 or 3 other people around you and answer this question.

You can use your notes from last time. You can use your computers:

A prime number is a positive, non-zero integer that cannot be divided by any other positive, non-zero integer, except ONE (1) and ITSELF.

For example, 5 is a prime number, but 6 is not (it's divisible by 2 and by 3).
The first five prime numbers are: 2, 3, 5, 7, and 11

Write a Python function, **prime()**, that takes an argument **n** and returns either True (if **n** is a prime number) or False (if **n** is NOT a prime number).

Class Exercise

```
def prime(n):
    p = True
    for i in range(2, n):
        if n % i == 0:
            p = False
    return p
```

Class Exercise

```
def prime(n):
    p = True
    for i in range(2, n):
        if n % i == 0:
            p = False
    return p

# Let's test our new function out!
for i in range(2, 3000):
    if prime(i):
        print(i)
```

BONUS: `print(i, ", ", end="")`

Exercise 3

Take out a piece of paper and write Python code that will go through all the numbers from **1 to 10 (inclusive of 1 and 10)** and prints out the product of all these numbers.

You MUST use a for-loop to solve this problem.

Exercise 3 - Solution

```
p = 1
for n in range(1, 11):
    p = p * n          # or p *= n
print(p)
```

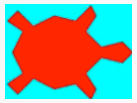
Exercise 4 – Nested Loops

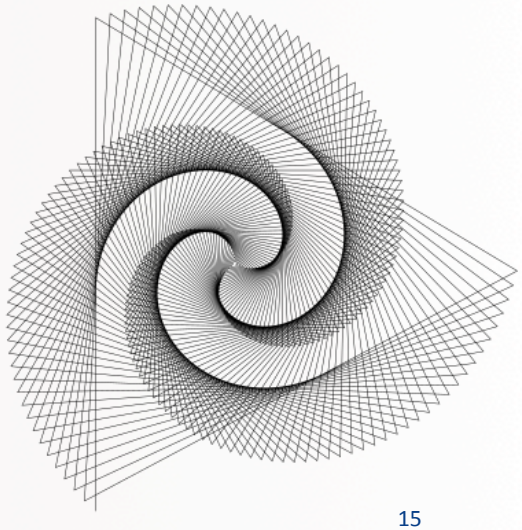
- What will this code do?

```
for p in range(2):
    for q in range(3):
        print("z", end="")
```

Introducing Turtle Graphics!

- A nice way to get introduced to simple graphics using Python
- You have to first **import turtle**
- You can then use it as per the demo I'm about to give…





Basic Turtle Commands

```
import turtle
timmy = turtle.Turtle()  # Set the turtle object, call it timmy!
timmy.forward(100)    # Draw forwards 100 pixels
timmy.right(90)       # Turn the turtle 90 degrees to the right
timmy.backwards(50)   # Draw backwards 50 pixels
timmy.left(45)        # Turn the turtle 45 degrees to the left
timmy.color("blue")   # Make timmy blue
timmy.pensize(3)      # Set the width of the pen
timmy.penup()         # Put pen up (can move it w/o drawing)
timmy.pendown()       # Put pen down (can draw again)
```

What Will These Do?

```
import turtle
boris = turtle.Turtle()
boris.color("blue")
boris.forward(100)
boris.right(90)
boris.forward(100)
boris.right(90)
boris.forward(100)
boris.right(90)
boris.forward(100)
boris.right(90)
```

```
import turtle
natascha = turtle.Turtle()
natascha.color("red")
natascha.forward(100)
natascha.left(60)
natascha.forward(100)
natascha.left(60)
natascha.forward(100)
natascha.left(60)
natascha.forward(100)
natascha.left(60)
natascha.forward(100)
natascha.left(60)
natascha.forward(100)
natascha.left(60)
```

YOUR TO-DOs

- ❑ Finish reading **Chapter 5**
- ❑ Finish **HW4** (due **TUESDAY**)
- ❑ Finish **Lab2** (turn it in by **Sunday**)

- ❑ Whistle while you work

</LECTURE>