CS 152: While Loops

CS 152: Python for STEM

Colorado State University

Weekly Announcements!

TODO Reminders:

• Reading 3 (zyBooks) – you already should have done that for Monday's class ☺

• Lab 01 – Warm Up

• Reading 4 (zyBooks) – you already should have done that for Wednesday's class ☺

• Lab 02 - Application

• Reading 5 (zyBooks) - – you already should have done that for today's class ☺

Recall Activity

- Individually:
    - analyze the function
    - write what is it purpose
    - write what should be "Message 1" and "Message 2"
    - write a function call
- Discuss your answers with your group
- Turn in your answers by the end of the class to the TAs or myself

```python
def function(num):
    if num == 0:
        print(num, "Message 1")
    elif num%2==0:
        print(num, "Message 1")
    else:
        print(num, "Message 2")
```

What are computers good at?

- Computers are good at three things
    - Calculations
    - Formal logic
    - Repeating what you just asked it to do (iteration/loops)
- Coincidently
    - Three areas humans tend to struggle with
- If you understand
    - Calculations
    - Formal Logic
    - And Loops
    - You will be able to accomplish impressive programs

Reading Checkin

- What is printed?

```python
def simpleWhile(start, end):
    counter = 0
    while start < end:
        counter -= 1
        start += 1
    return counter
```

```python
print(simpleWhile(12, 12))

print(simpleWhile(1, 0))

print(simpleWhile(0, 5))
```

While Loop

- You know conditions (from if statements)

- Loops *while* the condition is True

```python
while True:
    print("infinite loop, breaks computer")
```

```python
i = 0
while i < 10:
    print(i)
    i += 1  # increment i
```

```python
check = '-'
while check != 'y':
    print("I want to build a snowman.")
    check = input("Do you want to build a snowman? ")[0]
```

Off by One (OB1) Error

- Most common error in loops
    - Off By One

- Does this loop print 9 or 10 or 11 times?

```
i = 10
answer = ""
while i >= 0:
    answer += "{},".format(i)
    i -= 1
print(answer)
```

10,9,8,7,6,5,4,3,2,1,0,

```
i = 10
answer = ""
while i > 0:
    answer += "{},".format(i)
    i -= 1
print(answer[:-1])
```

10,9,8,7,6,5,4,3,2,1

Additional readings: https://www.geeksforgeeks.org/python-string-format-method/
https://towardsdatascience.com/the-basics-of-indexing-and-slicing-python-lists-2d12c90a94cf

While Team Coding Practice

- As a group

  - Write a function that has a while loop that adds all the numbers up to 100 (inclusive).

  - Write a function that display numbers from -10 to -1 using a while loop

  - Write a function that find the factorial of a given number

  - Write a function that receives two numbers and calculates the multiplication by addition. For example, for numbers 2 and 3, the multiplication will be calculated by 2 + 2 + 2 = 6.

- Have one person on the group code using their laptop and zybooks IDE

  - The person who codes has to limit their input. They follow the instructions of others

  - We will alternate who codes each class, so you won't always be typing.