

CS 152: While Loops

CS 152: Python for STEM

Colorado State University
Computer Science Department

Slides Originally Created by Albert Lionelle and Updated by Marcia Moraes



Colorado State University

Weekly Announcements!

TODO Reminders:

- Reading 5– you already should have done that 😊
- Lab 03 – Warm Up and Participation
- RPA 3
- Coding Exam 1 – you can start working on that
- Canvas Exam 1 – Friday as drop in hours CS110 1am-4pm



Recall Activity

- Individually:
 - analyze the function
 - write what is its 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, that will be your attendance for today

```
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)
- Coincidentally
 - 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?

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

```
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

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

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

```
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.