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 today's class ☺

• Lab 02 - Application

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

• RPA 2

Recall and Understanding Activity

- Analyze the function

- Write what is it purpose

- Write what should be "Message 1" and "Message 2"

- Write some test cases for this function.

```
def functionSomething(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

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

While Loop – Counted Loop

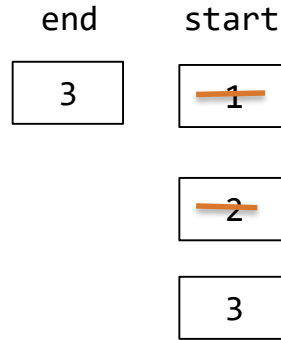- Is the kind of loop that we know how many times the loop is going to be executed

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

While Loop

```
def simpleWhile(start, end):
    while start < end:
        start += 1
    print("Start is now: ", start)
```

- Lets assume:

  end = 3;

  start = 1;

  while(1 < 3){

    start++;

  }

  while(2 < 3){

    start++;

  }

  while(3 < 3) – out of while

  print("Start is now: ", start);

end   start

| 3 | | ~~1~~ |

         | ~~2~~ |

         | 3 |

While Loop – Conditional Loop

- In a conditional loop we don't know who many times the repetition is going to happen, it could be zero or multiple times.

- That happens because the condition is related to a user input.

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

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.