Week 04

- While loops
- Flag pattern
- Functions
While loops

So far, we’ve used for loops which allow us to iterate through each item in a sequence.

While loops allow us to repeat an action an unspecified number of times.

Real world examples:

- Cook your pie until the crust is golden-brown
- Polish the silver until it shines
While loop syntax

```
while <condition>:
    <body>
```

- The expressions in `<body>` will be repeated until `<condition>` becomes False
- Indent important! Everything with the same indent (or more) “belongs” to the while loop.
- Colon important!!!
You can implement for loops using while loops

```
i = 0
while i < 5:
    print("i = ", i)
i = i + 1
```

same as

```
for i in range(5):
    print("i = ", i)
```
While loops - WATCH OUT!

While loops can loop forever if their <condition> never becomes False!!!

This is called an **infinite loop**

Ex.

```python
i = 0
while i < 5:
    print("i = ", i)
```

Because we don’t increment `i`, `i` never becomes >= 5

Ctrl-C will quit the program so you can fix it!
Good loop

```python
def main():
    i = 0
    while i < 3:
        print("i = ", i)
        i = i + 1

main()
```
Infinite loop

NOTE: Ctrl-C to forcibly quit your program!

```python
def main():
    i = 0
    while i < 3:
        print("i = ", i)
        # oh no, we don't increment i so we never
        # get out of the loop! e.g. i < 3 is never False

main()
```
Flag pattern

Flag - boolean variable that flips value to indicate something happened

**Analogy:** a red flag to indicate a potential problem

Example:

```python
redFlag = False

while not redFlag:
    # Do stuff
    if suspiciousActivity:
        redFlag = True  # This will exit loop!
```
Example - Press ‘q’ to quit

```python
***
1 Write a program that asks the user what they would like to do. If
2 the user types "q", the program should quit. Otherwise, the program should
3 print the user's input.

$ python3 quit.py
4 What would you like to do? (Press q to quit): go hiking
5 You selected: go hiking

What would you like to do? (Press q to quit): eat an egg sandwich
6 You selected: eat an egg sandwich

What would you like to do? (Press q to quit): q
7
```
Exercise - Today’s letter of the day is ‘s’!

Write a program that continually asks the user for words until they enter a word that starts with the letter ‘s’

Write down the steps on paper first.

How can a flag variable be used to determine whether we should ask the user for another word?

How can we determine whether a word starts with the letter ‘s’?

```bash
$ python3 letterOfTheDay.py
Enter a word: apple
You entered: apple

Enter a word: zebra
You entered: zebra

Enter a word: soup
You entered a word that starts with s!
```