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

The expressions in <body> will be repeated until <condition> becomes False

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

colon important!!!

Indent important! Everything with the same indent (or more) “belongs” to the while loop.

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!!!

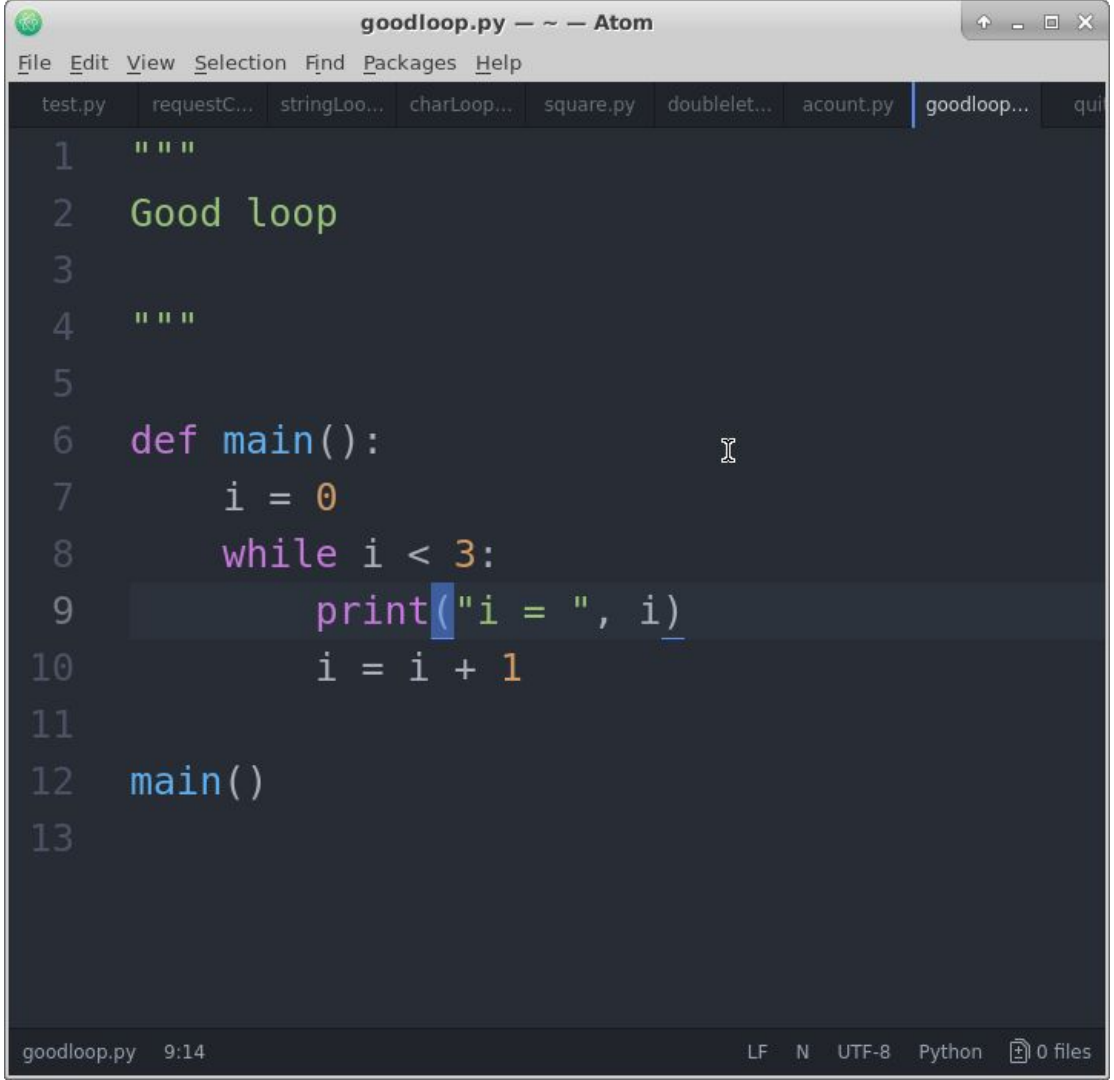
This is called an **infinite loop**

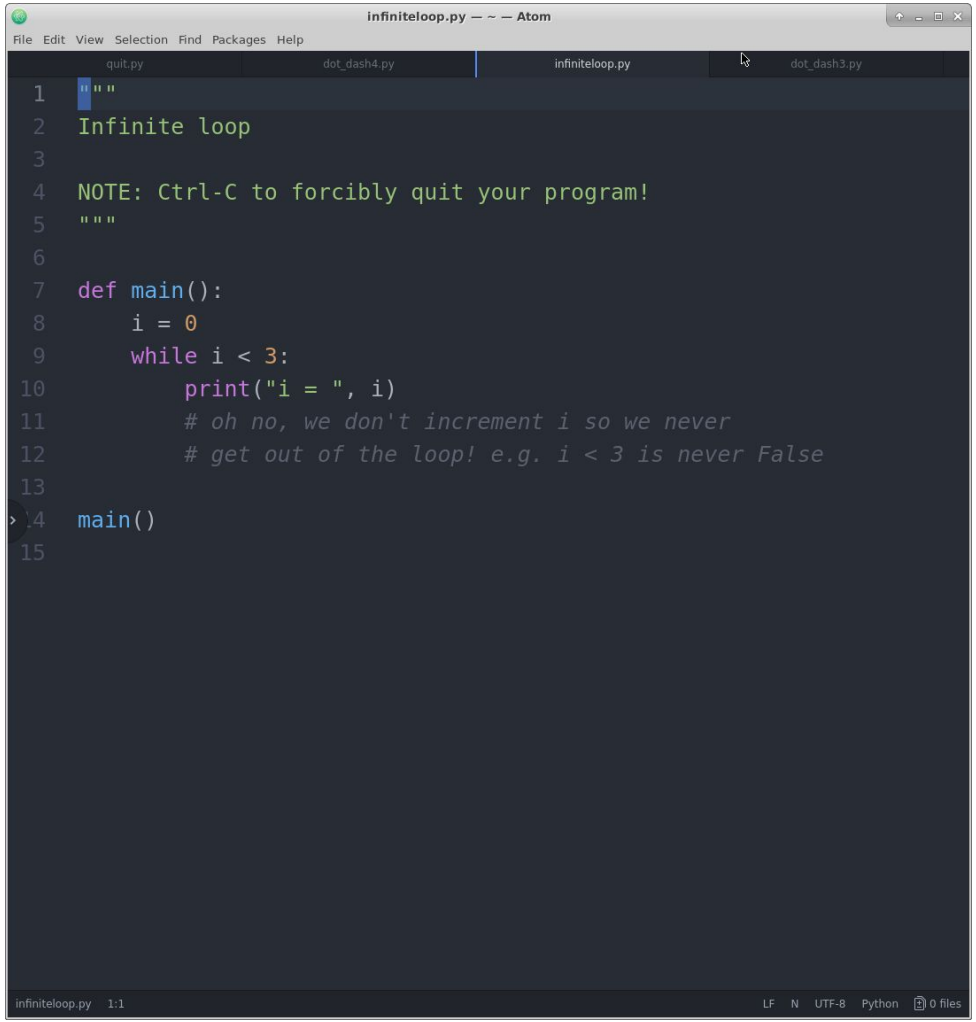
Ex.

```
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!


goodloop.py — ~ — Atom
File Edit View Selection Find Packages Help
test.py
requestC...
stringLoo...
charLoop...
square.py
doublelet...
acount.py
goodloop...
"""
Good loop
"""
def main():
i = 0
while i < 3:
print("i = ", i)
i = i + 1
main()
goodloop.py 9:14
LF N UTF-8 Python 0 files


infiniteloop.py — ~ — Atom
File Edit View Selection Find Packages Help
quit.py
dot_dash4.py
infiniteloop.py
dot_dash3.py
"""
Infinite loop
NOTE: Ctrl-C to forcibly quit your program!
"""
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()
infiniteloop.py 1:1
LF N UTF-8 Python 0 files

Flag pattern

Flag - boolean variable that flips value to indicate something happened

Analogy: a red flag to indicate a potential problem

Example:

```
redFlag = False

while not redFlag:

    # Do stuff

    if suspicousActivity:

        redFlag = True # This will exit loop!
```

Example - Press ‘q’ to quit

quit.py — ~ — Atom

File Edit View Selection Find Packages Help

quit.py | dot_dash4.py | infiniteloop.py | dot_dash3.py

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

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

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

   What would you like to do? (Press q to quit): q
"""

def main():

    timeToQuit = False
    while not timeToQuit:
        command = input("What would you like to do? (Press q to quit): ")
        if command == "q":
            timeToQuit = True
        else:
            print("You selected:", command)

main()

```

quit.py 8:1 LF N UTF-8 Python 0 files

quit2.py — ~ — Atom

File Edit View Selection Find Packages Help

quit2.py | dot_dash4.py | infiniteloop.py | dot_dash3.py

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

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

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

   What would you like to do? (Press q to quit): q
"""

def main():

    command = input("What would you like to do? (Press q to quit): ")
    while command != "q":
        print("You selected:", command)
        command = input("What would you like to do? (Press q to quit): ")

main()

```

quit2.py 15:1 LF N UTF-8 Python 0 files

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'?

```
$ 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!
```