coding in python

week 3

this week’s topic

- this is where the fun begins!
- we will spend the next two weeks working on loops and data structures
- this week, we will be learning about for loops and lists

first, let’s go over last week’s assignment

- a game for guessing numbers

what is a loop?

- loops are what we use to really use the power of computers
- loops do things over and over again

why would we use loops?

- hopefully this should be obvious
- loops allow us to make our computers do things over and over again
- this is exactly what computers are good at!

we've seen loops in action before

- remember our exercise with the circles
- also, remember last week's assignment

this week, we will only be looking at **for** loops

- **for** loops are used to make our computer go through a list of things
- it is pretty easy to create a for loop
  - thank python for this!

let's say we want to go through a list of things called **my_list**

```
>>> for thing in my_list:

>>>       do something
```

the parts of the for loop

- **for**
  - tells python that we are creating a for loop
- **thing**
  - the variable that is assigned to the value we look at
- **in**
  - **in** tells python that the variable is **in** the list

- **my_list**
  - the list we want to iterate through
  - the word iterate will come up often
- do something
  - this just means that anything below the for loop that is indented will be done for each iteration

what is a list?

- **for** loops need to be able to go through a list, so how do we make one?
- a list is just a list of values!
- we create a list by putting brackets around the values
- we can assign it to a variable as well

```
>>> shopping_list = [‘apples’, ‘oranges’, ‘pears’, ‘peaches’]
```

exercize

- create a list that represents shopping list
- make sure to put stuff inside it, like apples, oranges, etc.
- we will use this list later

editing a list

- the good thing about lists is that you can change them
  - it is a lot simpler in python than other languages
- there are many things you can do, but for now we only need to worry about several important ones

- to add something, use append()

```
>>> shopping_list.append('watermelons')
```

- to remove something, use remove()

```
>>> shopping_list.remove('oranges')
```

- to add two lists together, we can just use +

exercise

- use the shopping list
- add two things to the list, such as orange juice or milk
- remove something from the list
- print the list to check

indexing

- another really great things about lists is that you can grab specific things from the list by their position
- to do this, we use brackets

```
>>> fruit = shopping_list[index]
```

remember!

- almost all programming languages start counting from 0
  - the first value's index is 0, the second value's index is 1, etc.
- this is because these numbers represent positions in our computer's memory

here’s something cool!

- the last thing in a list has an index of -1

let’s try this out!

- use the same shopping list
- print the first value, the third value, and the last value

here’s something else that’s cool!

- we can treat string just like lists!
  - indexing, loops

iterating numbers

- this might seem strange...
- but what this means is that we iterate that number of times
- to do this, we use the range() function
  - range() creates a sequence of numbers up to, but not including, the given number

how do we use this?

- range() is useful because we can now do something a set number of times
- it basically creates a list, though not really

try it out!

- try and write a for loop that will print a message 5 times

exercise/homework

- write a program that is a countdown for a rocket ship
- don’t make a list of numbers, find another way to do it
- good luck