CIS 231

Python – Ch. 7

Iteration

7.1 Multiple assignment

- A reminder that an assignment to an already-initialized variable replaces the value that was stored there – old value is discarded
- Assignments are a one-time copy – if the source variable is changed, that doesn't change the one that was assigned its value

7.2 Updating variables

- Term to describe an assignment where the variable's current value is used in calculating its new value – e.g. `x = x + 1`
- Remember the first assignment to a variable is known as its *initialization*
- Adding by one is known as *incrementing*, subtracting by one is known as *decrementing*
- Looking ahead: `x += 1`

7.3 The `while` statement

- Another form of loop – but where `for` is used when the number of iterations is known at the outset, `while` checks a condition before each iteration to see if it should continue
- Use a boolean value/condition after while
- The condition is evaluated and if true the loop continues executing
- When it becomes false execution skips past the end of the loop

7.4 `break`

- Used to break out of the middle of a loop
- Can be useful but beware of overuse and in places where it isn't needed
- Consider this alternative to the book example:

```
line = input("> ")
while line != "done":
    print (line)
    line = input("> ")
```

7.5 Square roots

- An example of calculating a result iteratively
- Floats are inexact so checking for precise equality may be troublesome
- Comparing to a tolerance (often known as epsilon) will account for representational errors common to floats

```
if abs(x-y) < epsilon:
   break
```

7.6 Algorithm

- A process for solving a problem
- Translating a problem into a program will involve devising one or more algorithms that describe the process – the steps and the order
- When performing a task for the first time, it's best to break the task down into the smallest possible tasks – these will suggest what statements should be in your code

Next Time

- Ch. 8 – Strings
  - A string is a sequence
  - `len`
  - Traversal with a `for` loop
  - String slices
  - Strings are immutable
  - Searching
  - Looping and counting
  - …and a whole bunch more