Functions, Design and Other Strange Things

October 17

Strangeness, part 1

What the heck does

if __name__ == “__main__”:

mean, anyway? Now that you know about importing modules, we can tell you.

- It marks the start of the main program

All Python programs are “modules” - collections of functions and code that can be reused.

All Python programs can be imported by other Python programs

If __name__ == “__main__”

Each Python program has a name given to it by the Python interpreter when it executes

- If it’s a program running by itself, it’s name is “__main__” because there has to be a main program to run
- If it’s imported as a module, it’s name is the module name without a .py extension
    - If you import proj1.py into another program, it’s name to Python will be “proj1”

__name__ is the internal Python name of the variable that holds the module name.

The bottom line

The code that comes after if __name__ == “__main__” is ONLY executed when your program runs by itself. It will NEVER run if your program is imported as a module into some other program

- The functions you include in your program will run if they are called, whether the program runs by itself or it’s imported as a module

Design

Program design means breaking up the complex task you have to do into small manageable functions

“Modularity” - break up the task into modules

“Reusability” - if you have to do it once, you’ll probably have to do it again. Avoid having to write the same code over and over. Write modules so that they can be reused

Test each unit - test each function when you write it. Make sure it works properly; identify error conditions and test them.

Project 1 and design

Notes to be written out

A lot more about functions

Variable scope and visibility - an example to show what I talked about last time - you can “see” main program variables from inside a function, but you can’t change them

Can a function call another function?

Yes, as long as every function is defined before it’s called.

Two examples to illustrate:

- Sequential definition of functions
- Nested function definition

Can a function call itself?

Yes, this is known as “recursion”

- An illustration in the coding material