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**IT FDN 110**

**Assignment 06**

[**https://github.com/jwins66/IntroToProg-Python-Mod06**](https://github.com/jwins66/IntroToProg-Python-Mod06)

**Working With Functions and Classes**

**Introduction to Assignment 06 with Questions to keep in mind during the assignment:**

**What is a function?**

Functions are a way of grouping one or more statements. In Python, you must define a function before you can use code to call the function. Calling the function executes the statements in the function.

**What are parameters?**

Parameters are essentially variable names inside the parentheses of a function header:

for example…def display(message)…Where “ def” means definition, “display” is the function, and “message” is the variable.

Parameters allow you to pass values into the function for processing. The values passed into parameters are officially called arguments. However, it is common to call them parameters.

**What are arguments?**

Arguments are specified after the function name, inside the parentheses. You can add as many arguments as you want, just separate them with a comma.

<https://www.w3schools.com/python/gloss_python_function_arguments.asp>

When you create a function, you can pass in data in the form of an argument, also called a parameter.

What is the difference between parameters and arguments?

The term parameter and argument can be used for the same thing: information that is passed into a function. From a function’s perspective: A parameter is the variable listed inside the parentheses in the function definition. An argument is the value that is sent to the function when it’s called.

**What are return values?**

A return value is the expression following the return keyword. It is the result of the statement used to end the execution of the function call. If the return statement is without any expression, then the special value “None” is returned.

**What is the difference between a global and a local variable?**

A global variable has the entire program as their scope, whereas local variables have only the function in which they are defined as their scope.

**How do you use functions to organize your code?**

In Python, you **define a function with the def keyword, then write the function identifier (name) followed by parentheses and a colon**. The next thing to do is make sure you indent with a tab or 4 spaces, and then specify what you want the function to do for you. <https://www.freecodecamp.org/news/python-functions-define-and-call-a-function/>

**What is the difference between a function and a class?**

**Functions do specific things, classes are specific things**. Classes often have methods, which are functions that are associated with a particular class, and do things associated with the thing that the class is - but if all you want is to do something, a function is all you need. <https://stackoverflow.com/questions/18202818/classes-vs-functions>

**How do functions help you program using the “Separations of Concerns” pattern?**

The Separations of Concerns helps reduce complex problems into a series of manageable layers and components. It tends to reduce risks as changes are often isolated to a single component as opposed to intermingled throughout a large and complex code base.

Separation of concerns is implemented by encapsulating functionality in components that offer a well-defined interface. Components hide complexity such as user interfaces, business logic, data access and transaction execution from the rest of the code. When something changes, the interface often isn’t impacted meaning that the change is isolated to a component. <https://simplicable.com/new/separation-of-concerns>

**How are the debugging tools used in PyCharm?**

The details on how and when to use particular features are provided in the respective topics.

1. Define where the program needs to be stopped. This is done using [breakpoints](https://www.jetbrains.com/help/pycharm/using-breakpoints.html). *Breakpoints* are special markers, which represent places and/or conditions when the debugger needs to step in and freeze the program state. A program, which has been frozen by the debugger is referred to as *suspended*.

The alternative to using breakpoints is [manually suspending](https://www.jetbrains.com/help/pycharm/starting-the-debugger-session.html) the program at an arbitrary moment, however this method imposes some limitations on the debugger functionality and doesn't allow for much precision as to when to suspend the program.

1. [Run your program in debug mode](https://www.jetbrains.com/help/pycharm/starting-the-debugger-session.html).

Just right-click any line in the editor and select the Debug <filename> command from the context menu.

1. After the program has been suspended, use the debugger to [get the information about the state of the program](https://www.jetbrains.com/help/pycharm/examining-suspended-program.html) and how it changes during running.

The debugger provides you with the information about variable values, the current state of the threads, breakdown of objects that are currently in the heap, and so on. It also allows you to test your program in various conditions by throwing exceptions (for example, to check how they are handled) or running arbitrary code right in the middle of the program execution.

While these tools let you examine the program state at a particular instant, the [stepping](https://www.jetbrains.com/help/pycharm/stepping-through-the-program.html) feature gives you the control over step-by-step execution of the program. By combining the tools you can deduce where the bug is coming from and test your program for robustness.

[https://www.jetbrains.com/help/pycharm/debugging-code.html - general-procedure](https://www.jetbrains.com/help/pycharm/debugging-code.html%20-%20general-procedure)

**What is a GitHub webpage?**

The purpose of GitHub Pages is to provide the GitHub user a way to create personal websites for themselves and websites for their projects / repositories. For each registered GitHub account (representing a user or an organization) you can register one User Page, but an unlimited Project pages.

**Assignment 06:**

The script running in PyCharm:

Graphical user interface, text, application

Description automatically generated

Text file holding the ToDoList:

Graphical user interface, text, application

Description automatically generated

**Summary:**

The use of Functions, Classes and the usage of Separation of Concerns seem to be a clear and clean methodology of coding. I think that the Separation of Concerns provide a visible way of compartmentalizing code to work on it with fewer distractions. SoC is the equivalent of using punctuation and paragraphs in writing. In other words, SoC provides clarity and removes the run on of code without losing sight of the details of the code when using functions.