

HackerFrogs Afterschool

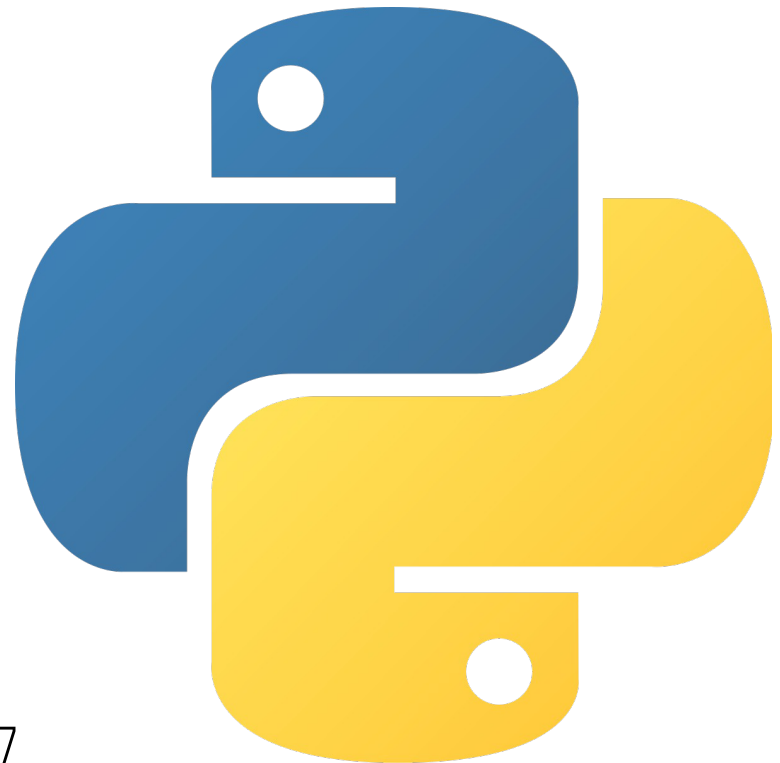
Python Programming Basics: Part 8

Class:
Programming (Python)

Workshop Number:
AS-PRO-PY-08

Document Version:
1.75

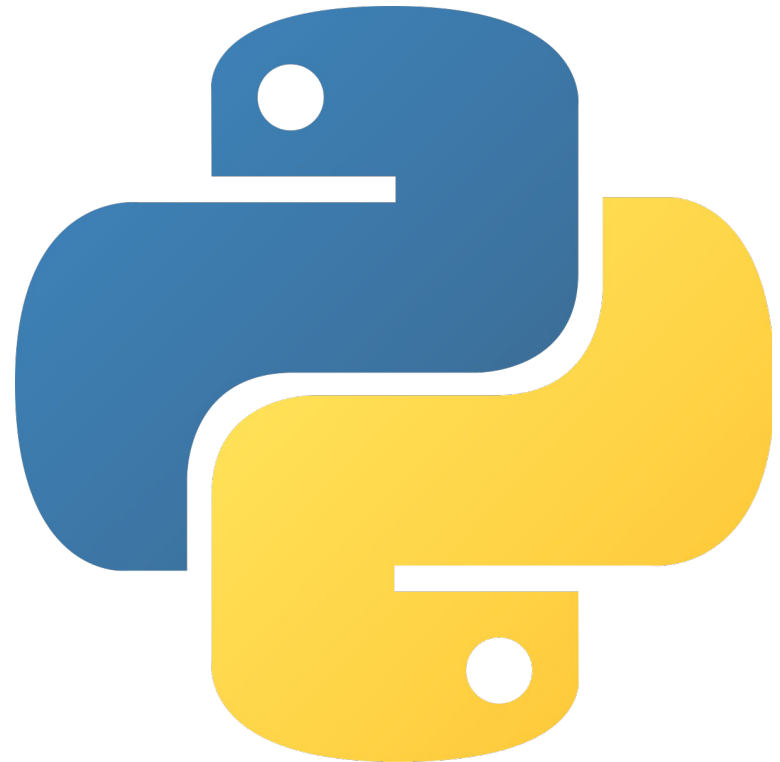
Special Requirements:
Completion of AS-PRO-PY-07



What We Learned Before

This workshop is the eighth and final class for intro Python programming.

During our last workshop, we learned about a few programming concepts through Python, including the following:



Dictionaries

```
country_capitals = {"England": "London", "Canada": "Ottawa"}
```

Dictionaries in Python are similar to other container objects, such as lists, except that data stored in dictionaries are pairs of keys / values, as opposed to individual items.

Dictionaries

```
john_vital_stats = {  
    "height": 170,  
    "weight": 90.2,  
    "age": 25,  
    "gender": "male"  
}
```

Dictionaries are useful for recording different key / value pairs that all pertain to one subject, or one common value across a number of subjects.

This Workshop's Topics

New topics for this session:

- Modules and Packages

Modules

A module is a piece of software which serves a specific purpose. Modules typically contain a number of functions, classes, variables, and / or methods which can be imported into a Python **namespace** to make use of extended functionality.



What are Namespaces?

A namespace is a collection of defined symbolic names and their corresponding values. Every Python program exists within a namespace, and importing modules into a namespace adds objects from the module into the current namespace.



Modules

```
import random  
num_list = [1,2,3,4,5,6,7]  
random.shuffle(num_list)  
print(num_list)
```

```
[6, 4, 3, 5, 1, 2, 7]
```

How can modules enhance our Python programs?

As an example, the Python **random** module contains a few different methods for generating random numbers or rearranging pre-existing data into random configurations.

Importing Modules

```
import random  
num_list = [1,2,3,4,5,6,7]  
random.shuffle(num_list)  
print(num_list)
```

```
[6, 4, 3, 5, 1, 2, 7]
```

In order to use module functionality, the module must be imported into the namespace. This can be done in one of two ways, either by importing the whole module into the namespace, as shown above.

Importing Modules

```
from random import shuffle  
num_list = [1,2,3,4,5,6,7]  
shuffle(num_list)  
print(num_list)
```

```
[5, 7, 2, 6, 1, 3, 4]
```

Or we can specify which methods or functions to import from a specific module, like the example shown here.

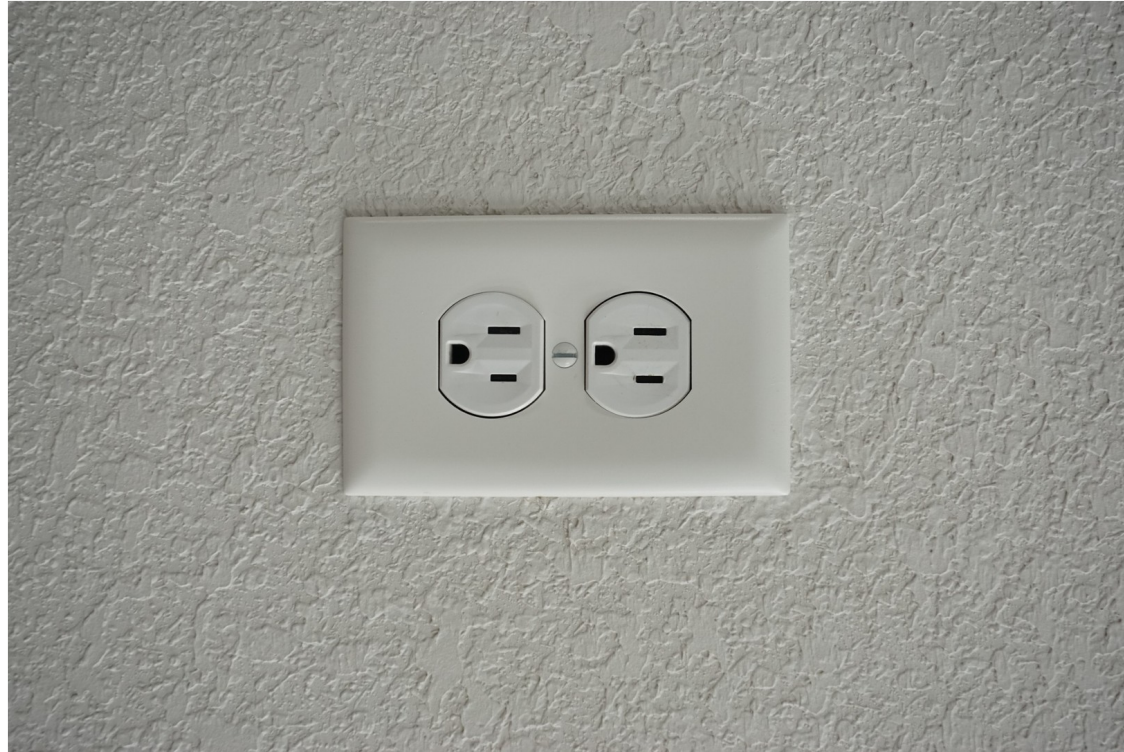
Importing Modules

```
from random import shuffle  
num_list = [1,2,3,4,5,6,7]  
shuffle(num_list)  
print(num_list)
```

```
[5, 7, 2, 6, 1, 3, 4]
```

Note that when we import specific functions from a module, we can access those functions without specifying the module name, like we did in the first example (`random.shuffle`).

The Python Socket Module



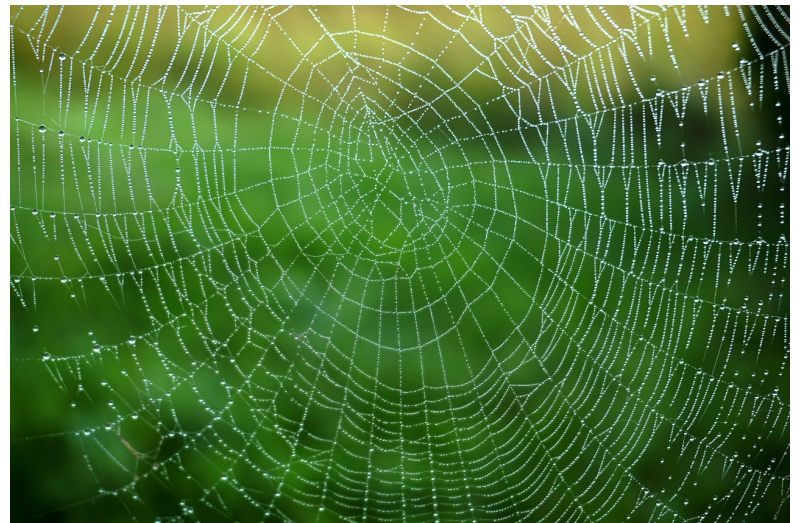
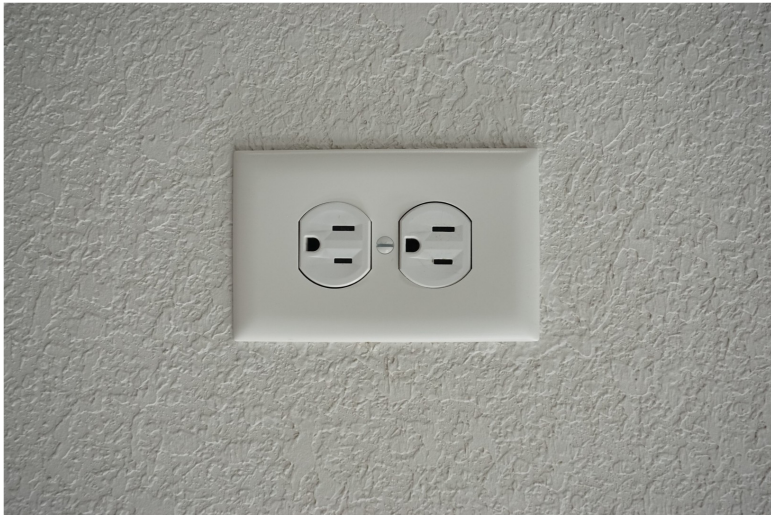
The Python socket module can be used to connect to, and interact with, networking ports on remote servers.

The Python Requests Module



And the Python requests module can be used to perform web requests and obtain data from websites.

The Python Socket Library



Let's learn how to use the socket module to solve some CTF challenges.

Internet Connected Web VM?



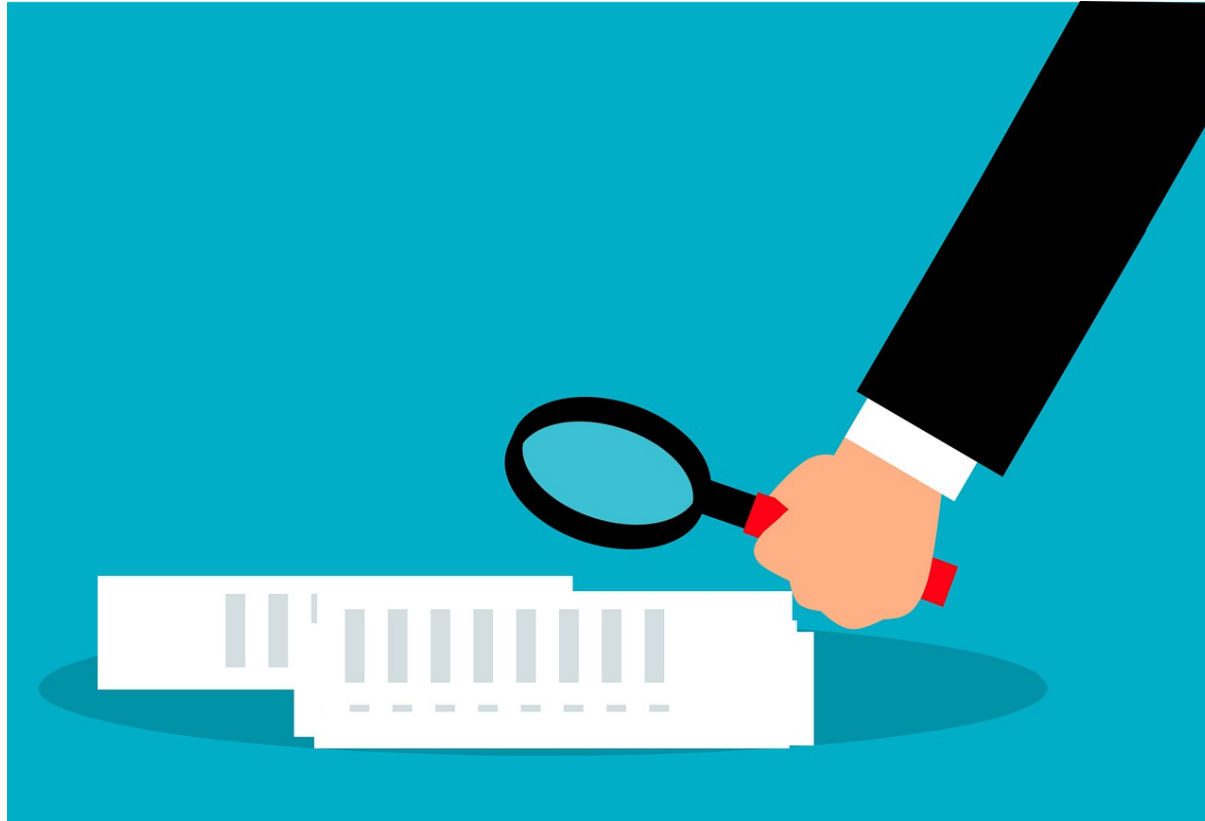
But where can we practice Python with a VM that is (kind of) internet connected? That's where PicoCTF saves the day!

Internet Connected Web VM?

We'll be using picoCTF to practice solving their CTF challenges with Python!

<https://play.picoctf.org/practice/challenge/242?category=5&page=2>

Summary



Let's review the programming concepts we learned in this workshop:

Modules and Packages

```
>>> import greetings  
>>> greetings.default_greeting()  
Hello, friend! How are you?
```

Modules and packages are pre-written code that can be imported into Python files to add functionality.

What's Next?

This is the end of the HackerFrogs AfterSchool intro to Python programming classes, but now that we know the basics we can start learning a lot more about coding in this extremely popular programming language!



Extra Credit

Looking for more study material on this workshop's topics?

See this video's description for links to supplemental documents and exercises!



Until Next Time, HackerFrogs!

