Python Scripting for CS – Lab 0

Lab orientation

# PowerShell Overview

“Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together.”[[1]](#footnote-1)

# Purpose

In this lab, you will have the opportunity to setup your python environment in Kali Linux.

## Skills

The purpose of this assignment is to help you practice the following skills that are essential to your success:

* Use verbs for the skills
* For example: Construct a command based on the syntax provided by a PowerShell help file

## Knowledge

This assignment will also help you become familiar with the following important content knowledge in this discipline:

* Could use competencies or learning objectives

# Instructions

Follow the instructions laid out in this lab, starting with Task 1. Tasks will build on each other and should not be done out of order.

There are critical thinking questions for you to answer on your own as well as definitions defined in **bold.** Critical thinking questions are identified in **green** with the corresponding employability skill.

Commands will be written in this Font and highlighted yellow. If the command is case sensitive, the letters that require capitalization will be underlined.

File names and programs will be written in this font and highlighted in gray. If the path or file name includes <a portion like this>, replace that piece with the required information, removing the <>.

Tasks that connect to previous course work will ask you to **Recall & Apply** from previous Learning Modules or classes.

# Criteria for Success

You will be successful when your Kali Linux server is fully configured and Python 3 virtual environment is installed.

# Lab Environment

In this class, you will be using Kali Linux VMs set up in Cloud.

# Log into VDI (Off-Campus only):

If you are off campus, you will first need to log into VDI in order to log into cloud.

1. Go to <https://vdi.nwtc.edu>
2. Select VMware Horizon HTML Access
3. Enter your NWTC ID# and Password
   1. It is the same username and password you use to access your NWTC email, etc
4. Select the Windows 10 VM to open the VM
5. In the Windows 10 VM, continue onto the next steps.

# Log into Lab Environment:

1. Go to <https://lab.nwtc.edu>
2. Select “Launch vSphere Client (HTML5)”
3. Log in with your NWTC credentials
   1. Username: Student ID#
   2. Password: Your NWTC password

## Finding your VMs:

In the upper left corner under the vSphere Client logo, select the icon for “VMs and Templates.”

Graphical user interface, application, website

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Drill down into gblab01.nwtc.edu > BT Datacenter > [instructor name] > [current session] > [class name & #] > [your name]

Make sure to expand the folder with your name. You should see [EDIT THIS]

Right click your VM and go to “Edit Settings”. Under the option “Network adapter 1”, check the box that says “Connected”. In the drop down list, select “Browse…” and choose the Network Adapter: BT-PowerShell-a-824. Click OK.

Graphical user interface, text, application, email

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Click the green play button that is near the top of the screen and wait for the machine to power on.

Once the VM is on, select Launch Web Console.

## To log into VMs:

Kali:

* Username: kali
* Password: kali

# Task 1: Update Kali Linux

1. Just as with any new environment, we should check for updates and ensure that our system is as up to date as possible. Open the Kali shell by going to Applications > Usual Applications > Accessories > Terminal Emulator
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2. **Recall & Apply Learning from Linux**: Run the following commands:
   1. sudo apt update
   2. apt list --upgradeable
   3. sudo apt upgrade
   4. sudo apt dist-upgrade
   5. sudo apt autoremove
      1. Acknowledge any error or information messages you may see. You may also need to enter your password to use “sudo”
      2. These commands may take some time to complete

# Task 2: Setting up Python

1. Once your updates are complete, type the following: python
   1. **Demonstrate Personal Accountability:** What python version do you see?
   2. **Think Critically and Creatively:** Notice that instead of the usual $ preceding our commands, it now looks like >>>. What command do you use to exit out of this python session?
2. If your Python version is lower than 3.6, update your python version with the following command: sudo apt-get upgrade python3
3. In this class, we’ll be using Python 3 with a **virtual environment**. A virtual environment allows us to keep our projects separate and in their own self-contained boxes. Any packages we install in our virtual environment will be contained there. In your terminal, type the following command: sudo apt-get install python3-venv
4. Now that we have our virtual environment installed, we need to create it. The first thing we are going to do is create a directory on root called pythoncs
   1. **Recall & Apply Learning from Linux**: Use your knowledge from Linux and command line to create a directory and change your directory so that you are pointing to your new directory.
   2. Your terminal should look like:
      1. 
5. To create a new virtual environment called vepython3, type the following:
   1. python3 -m venv vepython3
   2. **Think Critically and Creatively:** Based on what you’ve learned in your courses so far, what do you think this command is doing?
   3. **IMPORTANT**: Any scripts, packages, or executables we create are going to live in the pythoncs directory that we created in Task 2: Step 4.
6. To activate our environment, run the following:
   1. source vepython3/bin/activate
7. Notice that our terminal has changed which means we are now in our virtual environment we just created.
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8. A few things to note about our new virtual environment:
   1. To use python, we only need to use the command python instead of specifying python3 because that’s the version we’ve installed in our virtual environment.
   2. When we install Python packages using pip, those packages will stay contained in our vepython3 virtual environment.
9. In our virtual environment, we are going to install the lxml module. Type the following:
   1. pip install lxml
10. Check that lxml imported correctly by typing the following:
    1. python
    2. from lxml import etree
    3. exit()
11. To exit out of the virtual environment, you can use deactivate

# Task 3: Python IDE

1. Using an IDE is the easiest way to write code. In this class, we are going to use Visual Studio Code. In your Kali Linux VM, open Firefox and do a Google search for Visual Studio Code. Download the .deb version to your VM.
2. In a terminal window, type the following on one line:
   1. sudo apt-get install -f ~/Downloads/code\_1.79.0-1686149120\_amd64.deb
      1. The release number (in this case 1.79.0-1686…) is part of the filename. Yours will probably be different than the one in this lab example. Make sure you are using the number from the file that you downloaded.
3. Open Visual Studio Code (VS Code).
4. Open the Extensions panel by selecting the last option on the left side menu.
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5. In the extensions search, search for “python” and install the extension labeled “Python” that is certified by Microsoft.
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6. Click “Install”
7. A popup will appear asking you to select the Python Interpreter. Use the Recommended interpreter.
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8. Congratulations! Your environment is set up!

# Task 4: Accessing Github

1. Open Firefox in your Kali VM
2. Navigate to <https://github.com/RachelGehrke/PythonCS>
3. Open the current Learning Module. In this case, LM01
4. Download the Lab 1 instructions and any relevant files.

1. “What Is Python? Executive Summary,” Python.org, accessed June 12, 2023, https://www.python.org/doc/essays/blurb/ [↑](#footnote-ref-1)