LAB – USING LOOPS

OBJECTIVE

In this lab, you will iterate through a list of devices, which is a common requirement for network programmability. Using for loops and while loops to read information from a file and to iterate through a list of devices.

PART 1

Open a terminal and switch to the lab directory

STEP 1: OPEN A TERMINAL WINDOW

Double-click the Terminal icon on the desktop to open the terminal window for use in this lab.

STEP 2: CHANGE DIRECTORY

Change to the directory **labs/prne/** in the user home directory, which holds the files for the course labs.

```
~$ cd labs/prne/
```

PART 2

Open **Visual Studio Code**, create a new file and save it with a filename of **using-loops-part-2.py**. Ensuring to save the file in the **~/labs/prne/** directory, as otherwise the code will require modification to find the associated files that are used.
This python application will:

- Use a for loop to read lines from a file
- Use a for loop to iterate through devices in a list
- Use Python formatting capabilities to print nice output

STEP 1: CREATE EMPTY LIST

Create an empty list called device_list.

```
# Create the outer list for all devices
devices list = []
```

STEP 2: READ DEVICES AND CREATE LIST

Read information about devices and use a for loop to iterate through lines of the **devices-06.txt** file, one line at a time, placing the devices into the list device_list. The result of reading this information should be a list of devices, where each device is a list of device information.

```
# Read in the devices from the file
file = open('devices-06.txt', 'r')
for line in file:

    # Get device info into list
    device_info_list = line.strip().split(',')
    devices_list.append(device_info_list)
```

STEP 3: DISPLAY DEVICE INFORMATION

Create a second for loop that iterates through the list of devices. For every device, display nicely in a table the device information using the formatting functionality.

```
# Display heading
print('')
print('Name     OS-type  IP address           Software         ')
print('------   -------  ------------------   ------------------')

# Go through the list of devices, printing out values in nice format
for device in devices_list:

    print('{0:8} {1:8} {2:20} {3:20}'.format(device[0], device[1],
                                             device[2], device[3]))
```

STEP 4: CLOSE FILE

Close the file.

```
# Close the file
file.close()
```

STEP 5: SAVE, RUN AND VERIFY APPLICATION

Save you application and then run it from the terminal rather than from within visual studio code.

```
~/labs/prne$ python3 using-loops-part-2.py
```

The output from your application will be displayed in your terminal window, verify that it is comparable to below.

```
devasc@labvm:~/labs/prne$ python3 using-loops-part-2.py

Name     OS-type  IP address           Software
------   -------  ------------------   ------------------
d01-is   ios      Mgmt:192.168.122.1   Version 5.3.1
d02-is   ios      Mgmt:192.168.122.2   Version 4.22.18
d03-nx   nx-os    Mgmt:192.168.122.3   Version 5.3.1
d04-nx   nx-os    Mgmt:192.168.122.4   Version 5.3.1
d05-xr   ios-xr   Mgmt:192.168.122.5   Version 4.16.9
d06-xr   ios-xr   Mgmt:192.168.122.6   Version 5.3.0
d07-xe   ios-xe   Mgmt:192.168.122.7   Version 4.16.0
d08-xe   ios-xe   Mgmt:192.168.122.8   Version 5.3.0
```

PART 3

Open **Visual Studio Code**, create a new file and save it with a filename of **using-loops-part-3.py**. Ensuring to save the file in the **~/labs/prne/** directory, as otherwise the code will require modification to find the associated files that are used.
This python application will use the file **devices-06.txt** as the input for your application, and will:

- Use a while loop to read input from a file, utilizing the readline() function
- Use a while loop to iterate through devices in a list, using your own index variable in order to manually perform the iteration.

STEP 1: CREATE EMPTY LIST

Create an empty list called device_list.

```
# Create the outer list for all devices
devices_list = []
```

STEP 2: WHILE LOOP

Using a while loop to iterate through lines of the devices file, read information about all devices from the file **devices-06.txt**, one line at a time, placing the devices into a list. Then for each device, store the device information in a dictionary. The result of reading this information should be a list of devices where every device is a dictionary of device information.

NOTE:
That reading information from a text file requires reading the lines manually using file.readline().

```
# Read in the devices from the file
file = open('devices-06.txt', 'r')
line = file.readline()
while line:

    # Get device info into list
    device_info_list = line.strip().split(',')

    # Put device information into dictionary for this one device
    device_info = {}  # Create the inner dictionary of device info
    device_info['name'] = device_info_list[0]
    device_info['os-type'] = device_info_list[1]
    device_info['ip'] = device_info_list[2]
    device_info['version'] = device_info_list[3]

    # Append device and its info onto our 'devices' list
    devices_list.append(device_info)

    # Read the lines manually
    line = file.readline()
```

STEP 3: DISPLAY DEVICE INFORMATION

Create a second for loop that iterates through the list of devices. For every device, display nicely in a table the device information using the formatting functionality.

NOTE:
You will have to manually iterate through the indexes of the list of devices. Setting the list index to 0 at the start, check that the index is less than the length of the list as the while statement condition, and increment the index at the bottom of the while loop.

```
# Display heading
print('')
print('Name     OS-type  IP address           Software          ')
print('------   -------  ------------------   ------------------')

# Manually iterate through the indexes of list devices
index = 0
while index < len(devices_list):

    device = devices_list[index]

    print('{0:8} {1:8} {2:20} {3:20}'.format(device['name'],
                                             device['os-type'],
                                             device['ip'],
                                             device['version']))

    index += 1

# Display a blank line to make easier to read
print('')
```

STEP 4: CLOSE FILE

Close the file.

```
# Close the file
file.close()
```

STEP 5: SAVE, RUN AND VERIFY APPLICATION

Save you application and then run it from the terminal rather than from within visual studio code.

```
~/labs/prne$ python3 using-loops-part-3.py
```

The output from your application will be displayed in your terminal window, verify that it is comparable to below.

```
devasc@labvm:~/labs/prne$ python3 using-loops-part-3.py

Name     OS-type  IP address           Software
------   -------  -------------------  ------------------
d01-is   ios      Mgmt:192.168.122.1   Version 5.3.1
d02-is   ios      Mgmt:192.168.122.2   Version 4.22.18
d03-nx   nx-os    Mgmt:192.168.122.3   Version 5.3.1
d04-nx   nx-os    Mgmt:192.168.122.4   Version 5.3.1
d05-xr   ios-xr   Mgmt:192.168.122.5   Version 4.16.9
d06-xr   ios-xr   Mgmt:192.168.122.6   Version 5.3.0
d07-xe   ios-xe   Mgmt:192.168.122.7   Version 4.16.0
d08-xe   ios-xe   Mgmt:192.168.122.8   Version 5.3.0
```

PART 4 (OPTIONAL BUT HIGHLY RECOMMENDED)

As this lab is completed in NETLAB+ and your code files will be erased when the reservation ends, it is advisable to save your files in GitHub under your repository for this course.