Learning Lab Procedure

Step 1

Run the application `main.py` using the python debugger. Open a terminal window and navigate to the Desktop\PRNE\section16\debugging folder. Run `main.py` using the python debugger.

Answer

```
$ cd Desktop/PRNE/section16/debugging
$ pdb main.py
```

Step 2

List the code surrounding your current location using the `list` command.

Answer

You should see the following

```
(Pdb) list
  1  -> from util import read_devices_info
  2     from devclass import NetworkDeviceIOS
  3
  4     print '\n===== Reading CSV file, creating to devices'
  5     devices_filename = 'csv-devices'
  6
  7     devices_list_in = read_devices_info(devices_filename)  # read CSV in
  8
  9     # Iterate through all devices from the file, creating device objects
 10     devices_list = []
 11     for device_in in devices_list_in:
(Pdb)
```

Step 3

Step to the next line using the `next` command. List the surrounding code.

Answer

After issuing the next command, notice that the current line marker ('->') has changed to the second line of the application.

```
(Pdb) next
> /home/cisco/PRNE/section16/debugging/main.py(2)<module>()
-> from devclass import NetworkDeviceIOS
(Pdb) list
  1     from util import read_devices_info
  2  -> from devclass import NetworkDeviceIOS
  3
  4     print '\n===== Reading CSV file, creating to devices'
  5     devices_filename = 'csv-devices'
  6
  7     devices_list_in = read_devices_info(devices_filename)  # read   CSV
  8
  9     # Iterate through all devices from the file, creating device objects
 10     devices_list = []
 11     for device_in in devices_list_in:
(Pdb)
```

Step 4

Set a breakpoint at the line calling the function `read_devices_info()`.

Answer

The function `read_devices_info()` is being called on line 7. Use the command `break 7` to set the breakpoint.

```
(Pdb) break 7
Breakpoint 1 at /home/cisco/Desktop/PRNE/section16/debugging/main.py:7
(Pdb)
```

Step 5

Resume execution until the breakpoint. List the code surrounding your current line to verify the breakpoint executed correctly.

Answer

Use the `continue` command to resume execution.

```
(Pdb) continue
=====Reading CSV file, creating to devices
> /home/cico/Desktop/PRNE/section16/debugging/main.py(7)<module>()
-> devices_list_in = read_devices_info(devices_filename)  # read CSV info fo
(Pdb) list
  2     from devclass import NetworkDeviceIOS
  3
  4     print '\n===== Reading CSV file, creating to devices'
  5     devices_filename = 'csv-devices'
  6
  7 B-> devices_list_in = read_devices_info(devices_filename)  # read CSV in
  8
  9     # Iterate through all devices from the file, creating device objects
 10     devices_list = []
 11     for device_in in devices_list_in:
 12
(Pdb)
```

Step 6

Step into the `read_devices_info()` function. List the code surrounding the current line. You are now inside the `util.py` module.

Answer

Use the `step` command to step into the read_devices_info() function.

```
(Pdb) step
--Call--
>/home/cisco/Desktop/PRNE/section16/debugging/util.py(7)read_devices_info()
-> def read_devices_info(devices_file):
(Pdb) list
  2     from pprint import pprint
  3
  4     from devclass import NetworkDeviceIOS
  5
  6     #================================================
  7  -> def read_devices_info(devices_file):
  8
  9         devices_list = []
 10
 11         file = open(devices_file,'r')    # Open the CSV file
 12         csv_devices = csv.reader(file)   # Create the CSV reader for file
(Pdb)
```

Step 7

Step through the function until you reach line 12 in the `util.py` module. List your code to verify that you are on the right line of code.

Answer

You can use the `next` command or the `step` command to step through the function, executing one line of code at a time. You can also press enter.

```
(Pdb) next
>/home/cisco/Desktop/PRNE/section16/debugging/util.py(9)read_devices_info()
-> devices_list = []
(Pdb) next
>/home/cisco/Desktop/PRNE/section16/debugging/util.py(11)read_devices_info()
-> file = open(devices_file,'r')  # Open the CSV file
(Pdb) next
>/home/cisco/Desktop/PRNE/section16/debugging/util.py(12)read_devices_info()
-> csv_devices = csv.reader(file)  # Create the CSV reader for the file
(Pdb) list
  7     def read_devices_info(devices_file):
  8
  9         devices_list = []
 10
 11         file = open(devices_file,'r')   # Open the CSV file
 12  ->     csv_devices = csv.reader(file)  # Create the CSV reader for file
 13
 14         # Use list comprehension to put CSV data into list of lists
 15         return [dev_info for dev_info in csv devices]
 16
 17     #=============================================
(Pdb)
```

Step 8

Use the `return` command to the main program (main.py). Note that the debugger takes you to the return statement in your current function. Use the `return` command again to arrive back at the calling code, then list the surrounding code.

Answer

```
(Pdb) return
--Return--
> /home/cisco/Desktop/PRNE/section16/debugging/util.py(15)read_devices_info(
->[['ios-01', 'ios', '10.30.30.1', 'cisco', 'cisco'], ['ios-02', 'ios', '10.
-> return [dev_info for dev_info in csv_devices]
(Pdb) return
> /home/cisco/Desktop/PRNE/section16/debugging/main.py(10)><module>()
-> devices_list = []
(Pdb) list
  5     devices_filename = 'csv-devices'
  6
  7 B   devices_list_in = read_devices_info(devices_filename)  # read CSV in
  8
  9     # Iterate through all devices from the file, creating device objects
 10  -> devices_list = []
 11     for device_in in devices_list_in:
 12
 13         device = NetworkDeviceIOS(device_in[0],  # Device name
 14                                   device_in[2],  # Device IP address
 15                                   device_in[3],  # Device username
(Pdb)
```

Step 9

Display the contents of `devices_list_in` to make sure that the code has correctly read the device information from the CSV file.

Answer

Use the print command to display the contents of the variable.

```
(Pdb) print devices_list_in
[['ios-01', 'ios', '10.30.30.1', 'cisco', 'cisco'], ['ios-02', 'ios', '10.30
(Pdb)
```

Step 10

Use the `continue` command to execute the rest of the program.

Answer

```
(Pdb) continue
----- created device:  name:  ios-01  IP:  10.30.30.1
----- created device:  name:  ios-02  IP:  10.30.30.2
----- created device:  name:  ios-03  IP:  10.30.30.3

===== Connecting to each device
----- connected to device:  ios-01  IP:  10.30.30.1
----- connected to device:  ios-02  IP:  10.30.30.2
----- connected to device:  ios-03  IP:  10.30.30.3
The program finished and will be restarted
> /home/cisco/Desktop/PRNE/section16/debugging/main.py(1)<module>()
-> from util import read_devices_info
(Pdb)
```

Step 11

Remove the breakpoint and exit the python debugger.

Answer

```
(Pdb) clear
Clear all breaks? y
(Pdb) quit
$
```