LETTERKENNY INSTITUTE OF TECHNOLOGY

ASSIGNMENT COVER SHEET

Lecturer's Name: _____

Assessment Title: _____

Work to be submitted to: _____

Date for submission of work: _____

Place and time for submitting work: _____

To be completed by the Student

Student's Name: Zoltan Takacs

Student Number: L00169723

Class: BSc DCM

Subject Module: Object Oriented Programming

Word Count (where applicable): 1091

I confirm that the work submitted has been produced solely through my own efforts.

Student's signature: Zoltán Takács Date: 4th December 2021

Notes

Penalties: The total marks available for an assessment is reduced by 15% for work submitted up to one week late. The total marks available are reduced by 30% for work up to two weeks late. Assessment work received more than two weeks late will receive a mark of zero. [Incidents of alleged plagiarism and cheating are dealt with in accordance with the Institute's Assessment Regulations.]

Plagiarism: Presenting the ideas etc. of someone else without proper acknowledgement (see section L1 paragraph 8).

Cheating: The use of unauthorised material in a test, exam etc., unauthorised access to test matter, unauthorised collusion, dishonest behaviour in respect of assessments, and deliberate plagiarism (see section L1 paragraph 8).

Continuous Assessment: For students repeating an examination, marks awarded for continuous assessment, shall normally be carried forward from the original examination to the repeat examination.

Introduction: In this assessment there are 5 exercises, I created a virtual machine with Ubuntu 21.04 64-bit desktop version VM instance on WIN10 host machine. Beside the WIN 10 host machine and VMware WS Pro to complete the tasks I used the following programs and applications: Python 3.9, PyCharm, MS Visual Studio Code, GitHub, Putty, Apache2, and MC.

The following Python packages were used: Pylint, BS4, datetime, paramiko, requests, time, sys, and socket.

The GitHub URL to my repository is: https://github.com/z-takacs/Bsc_DCM_OOPR_21.git

Discussion: In this section I will revisit the questions/exercises individually.

- **Question 1-Apache:** This exercise was straightforward. After the installation and updating the guest OS I was able to install Apache2 without any issue. Created the rules on the firewall for Apache2 and after bouncing the services everything worked fine as it is showed by the screenshots.
- **Question 2-Webscraping:** For this exercise I installed Beautiful Soup v4.10.0 and requests packages. I used Python project documentation page as a base reference (Python, 2021)[1] . Used lxml for parsing and used the prettify function. Used the landing/welcoming page of Apache2 which was created for Question1 on the Ubuntu VM. The scrapings are saved locally into "results.text" file, which will be reopened with read permissions. For the last section of this exercise, I tried to answer the extra questions from the Assignment debrief document. I had some issue to create the code for the headers, so I left out that question.
- **Question 3-SSH:** Using Paramiko package created SSH connection to the VM. Depending on the return from the VM, the program displays different messages. Occasionally I received no error, but the code did not produce the expected return. The only message received the "Process finished with exit code 0" from the Python IDE which in theory means everything is fine. To be able to determine if the SSH connection is working, I used PUTTY`s SSH function for testing. If Putty is connected but PyCharm did not show the output, I knew the code was wrong. At the end I was able to fix all the issues and successfully connect to the VM. (Lennon R G,2021)[1]
- **Question 4-Portscan:** For this project I used the Socket package. After entering the IP socket is scanning the ports on the remote host. Originally for a dry run I set the port range for the common TCP/IP ports (0-1023) however it took long even though I knew only very few ports are open. Eventually I narrowed down the port range between 0 and 81, so the programme will include and return HTTP port 80. I also did not setup an extensive range of ports for the port names. There are different outputs are setup for different scenarios. If the port scan is done it will return the port numbers and the related service names. In my case there were only SSH port 22 and HTTP port 80 open on the VM. The programme is timing the length of the execution time of the code using the "datetime" package. After the output the time is displayed.
- **Question 6-Terraform:** I do not have experience with Terraform and honestly, I was a bit worried. It was a good learning curve. The setup on the AWS portal was easy as it is very similar to OCI, I am currently under OCI training at work. This similarity provided some ease. Following documentation was logical and I was able to complete the lab. Although I can say that I did not come across some difficulties. As Figure: 2.3 and 2.4 shows from my Q6_Terraform pdf I get some errors while executing some tasks. At one stage I was receiving:
  "*Error: error configuring Terraform AWS Provider: error validating provider credentials: error calling sts:GetCallerIdentity: SignatureDoesNotMatch: Signature not yet current: 20211203XXXXXX is still later than 20211203XXXXX (20211203XXXXXX + 15 min.)| status code: 403, request id: XXXXXX*
  After reading many documents and guide finally I found the resolution on a community support page. The issue was caused by the Ubuntu OS was not set to automatic time and time zone.

Even though the time was correct on the VM, the system time was manually set. As soon it was updated to automatic, I was able to get through that step. (Lennon R G,2021).[2&3]

Conclusion: During this project I learned a lot, I experienced different issues. Occasionally I had more issues with Github or the Virtual Machine than with creating scripts itself. I had some issues with GitHub where I was not able to push to the repository. I wanted to put more focus on the exercises than GitHub. I wiped the repository and started on a second time everything worked out. Based on one of our previous discussions I installed Pylint to help to be able to follow the coding standards and eliminate the errors.

I firmly believe with the application of the curriculum with these practical exercises helped me to gain knowledge not just in relation with Python but with the surrounding applications too.

References:

Python. (2021). *beautifulsoup4 4.10.0.* Available: https://pypi.org/project/beautifulsoup4/. Last accessed 30th Nov 2021.[1]

Python. (2021). *socket — Low-level networking interface.* Available: https://docs.python.org/3/library/socket.html. Last accessed 30th Nov 2021.[2]

Bibliography:

Lennon, R G. (2021). Network Examples. (Part 1), 3-4.[1]

Lennon, R G. (2021). Terraform Basics Ubuntu, (Part 2), 2-8.[2]

Lennon, R G. (2021). Terraform AWS Example, (Part 3), 3-11.[3]