**Programming Assignment Solutions**

**CONCLUSION**

The current assignment is based on the different functionalities that I have worked on using the python, AWS services and Virtual Machines. Through this exercise I was able to understand the connection of each stage and understand the DevOps concepts to a great extent. All the files related to the assignments have been tested and pushed to a GitHub URL. The GitHub URL has been provided having private permission with limited access which will be controlled by the admin. To provide the permission to view the page, collaborator permission will be provided as required. The GitHub URL containing all the sufficient files is provided below:

URL: <https://github.com/L00163455/OOPR_Assignments.git>

In the above URL, the scripts/ codes corresponding to each question will be available in the ‘Script folder’ and the documents with output screenshots will be available in the ‘Documents’ folder in the GitHub URL.

The first question is based on installation of a web server using Apache2 on a virtual machine. The virtual machine was created with the operating system of Ubuntu. In the Ubuntu, for this assignment, the Linux commands and scripts were mostly used. The Apache web servers were installed after configuration and started with the Linux commands, tested with the help of browser using the local host IP address provided in the configuration. For the completion of the question, it was checked for the status and the web server was stopped and the browser response were recorded and the screenshots on each stage were taken and documented in the file – ‘L00163455\_Q1\_File\_1.docx’.

The second question is an added functionality to the first question and using the web server created by the Apache server, python enables the search functionality of words, headings etc. The apache2 web server. The python script used for the same is provided in the GitHub script file – ‘L00163455\_Q2\_File\_2.py’. Once the python script has been created, the Apache web server host was established checked two words, heading and later the code was modified to enable the user to input the words on runtime and the IP address that will be asked to check for the number of occurrences of each word/ heading as required. The screenshots on each stage were taken and documented in the file – ‘L00163455\_Q2\_File\_1.docx’.

The third question uses the SSH connection to establish connection with the IP address of the virtual machine used with the help of VM ware. The script would ask the user for username and password for logging in to the virtual machine and after the authorization, the python file will check if the connection can be established or not. The python script used for the same is provided in the GitHub script file – ‘L00163455\_Q3\_File\_2.py’. The connection if not established would show an error on authorisation. The screenshots on each stage were taken and documented in the file – ‘L00163455\_Q3\_File\_1.docx’.

The fourth question checks the ports of a particular IP address is open or not and displays the connection details in a tidy format. The ports which are particularly checked are SSH and HTML ports with the values 22 (SSH) and 80 (HTML). The python script used for the same is provided in the GitHub script file – ‘L00163455\_Q4\_File\_2.py’. For testing the port status, IP address of the web server apache2 created in the ubuntu OS VM was used. The screenshots on each stage were taken and documented in the file – ‘L00163455\_Q4\_File\_1.docx’.

The fifth question establishes a connection with the operating system of the ubuntu Virtual Machine and folder and two sub folders are created by integrating python with the Linux commands using connection scripts in the python script. The python script will check if the folders are already present. If present, the script will recreate the folders forcefully. The python script used for the same is provided in the GitHub script file – ‘L00163455\_Q5\_File\_2.py’. After executing the script, the Ubuntu OS operating VM is checked for whether the folders and subfolders are created as expected. The screenshots on each stage were taken and documented in the file – ‘L00163455\_Q5\_File\_1.docx’.

The sixth question makes use of Terraform which is an open source IAAS (Infrastructure as a code). The terraform was used to establish a connection with the AWS services using terraform script created using the command prompt. The Terraform scripts used for the same is provided in the folder – ‘L00163455\_Q6’. Once the connection was established the started an instance of AWS. The instance would run until the terraform was executed to destroy locally. Usage of AWS costs if not destroyed after use. The screenshots on each stage were taken and documented in the file – ‘L00163455\_Q6\_File\_1.docx’.

To conclude the current assignment connects each other to add functionalities to enable connections with local machines and different virtual machines using the IP address, and to handle any authorization issues if found any. Python as a tool is a powerful language which can be used for creating codes to perform remote applications and server related actions. With knowledge of python and the functionalities, one can establish connections and control server operations and connection checks.