CIS4010 Cloud Computing (Fall 2021)
Assignment 3: Can't get enough of those VM's…

Goal
To design a Python script that will automate the creation and deployment of Virtual Machines on Azure and GCP using the CLI's for each platform.

Description of VM's
There will be two input files to your Python script (the script will be called automate.py) called Azure.conf and GCP.conf and will have the typical .conf format. The following is an example of Azure.conf:

```
[azure01]
purpose = webserver
os = linux
name = linuxServer01
resource-group = images
team = Toronto Office Web Grls
image = Debian
location = canadacentral
admin-username = azureuser
[azure02]
purpose = office apps
os = windows
name = winServer01
resource-group = images
team = Toronto Office Web Guys
image = Win2019Datacenter
location = canadacentral
admin-username = azureuser
```

Azure Notes
- [azure01] and [azure02] are tags that define the different VM's. The first part of the name identifies the Cloud platform and the numbers must all be unique and start at 01 and increase by 1 for each VM. At most there can be 10 VMs.
- The names in red are used by the CLI and you will have to extract this information from the .conf file. The other names (in blue) are there to provide documentation for system administration purposes.
- To get the list of all available images start with
    $ az vm image list --location canadacentral -o table
  and look for the URN or UrnAlias
- The admin password for Windows servers must be between 12 and 123 characters in length and must have the 3 of the following: 1 lower case character, 1 upper case character, 1 number and 1 special character.

The following is an example of gcp.conf:

```
[gcp01]
name = linuxserver01
project = Web Presence Canada
team = Toronto Office Web Team
purpose = webserver
os = linux
image = debian-10-buster-v20210916
imageproject = debian-cloud
zone = northamerica-northeast2-a
[gcp02]
name = winserver01
project = Containers Are Us
team = Toronto Office Container Team
purpose = containers
os = windows
image = windows-server-2019-dc-core-for-containers-v20211012
imageproject = windows-cloud
zone = northamerica-northeast2-b
```

GCP Notes
- [gcp01] and [gcp02] are tags that define the different VM's. The first part of the name identifies the Cloud platform and the numbers must all be unique and start at 01 and increase by 1 for each VM. At most there can be 10 VMs.
- The names in red are used by the CLI and you will have to extract this information from the .conf file. The other names (in blue) are there to provide documentation for system administration purposes.
- To get the list of all available images start with
    $ gcloud compute images list
  and look for NAME and PROJECT
- For GCP, the name of the VM must only contain lower case letters and numbers

Python Script Specification

Automate.py will:
- read the files azure.conf and gcp.conf, if they exist, and will create the VM's described in these files
- check that sufficient information is contained in the descriptions and that the variable names are correct for the Cloud platform

- use the information in the files to compose CLI commands and will then execute them to create the VM's
- print out the CLI command before executing it
- print out the information that the CLI command returned (might be nice to tidy this up so that both of the outputs – Azure and GCP – look similar
- create a documentation file named VMcreation_<date stamp>.txt containing the following:
  - Date Stamp: the date stamp here and in the file names will have the format yyyy-mm-dd:hh:mm:ss. For example: 2021-10-17:17:16:26
  - System Admin Name: username of the person who ran the Python script
  - For each VM created:
    - Name
    - Project
    - Purpose
    - Team
    - OS
    - All relevant information about the VM
    - Status of the VM
- move the azure.conf and gcp.conf files to azure_<date stamp>.conf and gcp_<date stamp>.conf

The azure.conf and gcp.conf files will contain at least the information that is in the example files but should contain more variables that allow you to finely tune the VM (aspects such as CPU choice, memory size, disk space, etc.). You must also allow the user to specify that certain ports should be open and you MUST be able to handle the user specifying that port 80 (http) or 443 (https) be open.
- The more detail in the specification of the VMs that you allow with your script, the higher your grade. 5 out of 40 marks will be devoted to these detailed specifications.