Homework Assignment No. 01:

Cloud Computing

submitted to:

Professor Joseph Picone
ECE 1111: Engineering Computation I
Temple University
College of Engineering
1947 North 12th Street
Philadelphia, Pennsylvania 19122

August 27, 2022

prepared by:

Leo Berman
Email: leo.berman@temple.edu

A. ASSIGNMENT

ECE 1111: Engineering Computation I

Homework No. 1: Cloud Computing

Goal: Demonstrate that you can log into Amazon AWS, traverse the file system, execute simple Unix commands, and manipulate your environment.

Description: The tasks are:

1. Log into your Amazon account. List the files in your home directory using "ls -l" or the alias "d". Capture the screen output into a Word document by cutting and pasting the text from your terminal window – not including a screenshot (there are reasons for this).
2. Demonstrate the use of command completion for both Linux commands and for filenames that match what you have typed from the command line. For example, type "nedc_" and hit tab. Explain the output that you see. Then change directories to your home directory using "cd $HOME". Follow this by typing "ls -l .ssh/" and hit tab. Explain what you observe.
3. Explain the function of your .bash_profile and .bashrc. Use the more command to view these. Include a copy of these in your report.
4. Using the text editor emacs, run using our local version, isip_e, modify your .bash_profile to set an environment variable named "ECE_1111" to a value of "Spring_2022". Similarly, modify your .bashrc so that every time you create a new shell, the environment variable is updated to show the current date and time using this useful command:

   ECE_1111=`date`;

   Explain what this command does and what is the function of the backquote characters ("`"). Demonstrate the difference between logging in and starting a new shell. Explain when each of these are executed.
5. Demonstrate the use of the "ls -l" command by changing your directory to your local ece_1111 directory ($HOME/ece_1111) and displaying the contents of your .ssh directory ($HOME/.ssh). Explain what information is shown in the output.

Submit these five results in a single pdf document located here:

ece-000:/data/courses/ece_1111/current/homework/hw_01/<lastname_firstname>/hw_01.pdf

Use the MS Word template located here for this assignment:

https://www.isip.piconepress.com/courses/temple/ece_1111/resources/templates/lastname_firstname_hwxx.docx

Substitute "hw01" for "hwxx" in the filename.

Follow these instructions carefully. An important part of this course is learning how to conform to requirements. Programming involves a process of setting requirements and then implementing code that meets those requirements. Requirements gathering is an important part of the programming, or software engineering, process.

B. BRIEF DESCRIPTION OF YOUR CODE

Question 1: ls shows a list of files in the directory and adding a -l at the end displays some information about how many bytes each file/directory is taking up, who has permission to read/write/execute. In the appendix for question 1 the results of ls -l are shown and it displays the directories and files in your working directory and some information such as permissions, ownership, and last time the document was edited.

Question 2: What I observed is that the only available file is authorized keys. This means that the only file in my home/ssh directory. In the appendix for question 2 you can see that when I tabbed it autofilled the command which means that there was only one option for me to access which would be that authorized keys file.

Question 3: The function of .bash_profile is that this loads in whenever you log into ece-000 and it sets up some customization and executes your .bashrc which sets up some more customization. These commands work together to configure the user to the environment. The purpose of the .bash_profile is to execute the commands within the .bash_profile and then run your .bashrc which sets up an entirely different set of commands to help set up your personalized environment each time you ssh into the AWS server. While the .bashrc runs everytime you open a new shell, the .bash_profile only runs when you log onto the AWS server. You can see copies of my .bash_profile and .bash_rc in the appendix for question 3.

Question 4: Export ECE_1111 = ‘date’ sets the variable ECE_1111 to state whatever the current date is to what the current date and time is whenever the command is executed. To display this in the terminal use the echo command. I set export ECE_1112 = “SPRING 2022” which sets the variable to say SPRING 2022 and the quotation marks mean that the words inside means that they will be exported as text. The difference between logging in and creating a new shell is that logging in lets you use the shell assigned to you and this is the one linked to your account. Creating a new shell happens after you are logged in and you can link as many as you want to your account. By using the echo command to echo these variables you can see in the appendix for question 4 that when I ssh into the AWS server it executes my .bash_profile displaying the relevant variable and then my .bash_profile executes my .bashrc which displays the other relevant variable. You can also see my updated .bashrc and .bash_profile in the appendix for question 4.

Question 5: The contents of my $HOME/ssh directory shows only the directory authorized_keys which has zero bytes which means that there is no information within the authorized_keys. These authorized keys are configure who has the ability to access the shell and since there are no configured authorized_keys for users to prove their identity to access the server via my $HOME/ssh directory. The appendix for question 5 displays a list of all the files in my $HOME/ssh directory which as we know from question 2 is only that authorized_keys file.

C. SUMMARY

The main takeaway I got from this assignment was a deeper understanding of .bashrc and .bash_profile. While I understood the order of operations before I started working on the assignment, I now have slightly more in-depth information on the topic and how the .bash commands setup the environment and makes sure that all the variables are set to set up the configuration before you start working on the terminal.

D. APPENDIX

Question 1:

```
ece-000_[1]: ls -l
total 4
-rw-rw-r--. 1 tuo54571 ece_1111   9 Aug 24 12:22 #File#
drwxrwxr-x. 2 tuo54571 ece_1111   6 Aug 24 11:19 HomeLogin
drwxrwxr-x. 3 tuo54571 ece_1111  24 Aug 26 12:26 homework
drwxrwxr-x. 2 tuo54571 ece_1111   6 Aug 26 13:01 lab
drwxrwxr-x. 2 tuo54571 ece_1111   6 Aug 26 11:26 lbfunctions
drwxr-xr-x. 2 tuo54571 ece_1111 130 May 23 07:32 login
drwxrwxr-x. 2 tuo54571 ece_1111  54 Aug 26 11:31 quiz_01
drwxrwxr-x. 4 tuo54571 ece_1111  47 Aug 26 11:24 Testing
```

Question 2:

```
ece-000_[1]: sd $HOME
/home/tuo54571
ece-000_[1]: ls -l .ssh/authorized_keys
```

Question 3:

```
ece-000_[1]: more ~/.bashrc
#!/bin/bash

# file: $NEDC_NFC/login/template_shell_bashrc.sh
#
# this is the standard ISIP template for a user's .bashrc.
# it should be copied to a user's home directory (~/.bashrc).
#

#------------------------------------------------------------------------------
# required stuff goes here
#------------------------------------------------------------------------------

# define the location of isip tools
#
. /data/isip/tools/GET_ENV.sh;
#------------------------------------------------------------------------------
# general customizations go here
#------------------------------------------------------------------------------

#------------------------------------------------------------------------------
# local customizations go here
#------------------------------------------------------------------------------
#
# end of file
```

```
ece-000_[1]: more ~/.bash_profile
#!/bin/bash
#

# file: $NEDC_NFC/login/template_bash_profile.sh
#
# this is the standard ISIP template for a user's .bash_profile.
# it should be copied to a user's home directory (~/.bash_profile).
#

# execute the bashrc
. $HOME/.bashrc

#
# end of file
```

Question 4:

```
ece-000_[1]: more ~/.bashrc
#!/bin/bash

# file: $NEDC_NFC/login/template_shell_bashrc.sh
#
# this is the standard ISIP template for a user's .bashrc.
# it should be copied to a user's home directory (~/.bashrc).
#

#------------------------------------------------------------------------------
# required stuff goes here
#------------------------------------------------------------------------------

# define the location of isip tools
#
. /data/isip/tools/GET_ENV.sh;
export ECE_1111=`date`
echo $ECE_1111
#------------------------------------------------------------------------------
# general customizations go here
#------------------------------------------------------------------------------

#------------------------------------------------------------------------------
# local customizations go here
#------------------------------------------------------------------------------
#
# end of file
```

```
ece-000_[1]: more ~/.bash_profile
#!/bin/bash
#

# file: $NEDC_NFC/login/template_bash_profile.sh
#
# this is the standard ISIP template for a user's .bash_profile.
# it should be copied to a user's home directory (~/.bash_profile).
#

# execute the bashrc

export ECE_1112=Spring_2022
echo $ECE_1112
#
. $HOME/.bashrc

#
# end of file
```

```
┌──────────────────────────────────────────────────────────────────────────────┐
│              • MobaXterm Personal Edition v22.1 •                            │
│            (SSH client, X server and network tools)                          │
│                                                                              │
│ ➤ SSH session to tuo54571@ec2-18-208-36-230.compute-1.amazonaws.com          │
│   • Direct SSH      : ✓                                                      │
│   • SSH compression : ✓                                                      │
│   • SSH-browser     : ✓                                                      │
│   • X11-forwarding  : ✓  (remote display is forwarded through SSH)           │
│                                                                              │
│ ➤ For more info, ctrl+click on help or visit our website.                    │
└──────────────────────────────────────────────────────────────────────────────┘

Last login: Tue Aug 30 09:49:45 2022 from wirelessnat169.wireless.temple.edu

  ______  ______   ______
 /\ ___\ /\ ___\ /\ ___\ Hostname: ece-000
 \ \ __\ \ \ \____ \ \ __\      URL: ece-000.eng.temple.edu
  \ \_____\ \ \_____\ \ \_____\   IPv4: 18.208.36.230
   \/_____/ \/_____/ \/_____/

Please direct any reports to help@nedcdata.org
The man command, as in man rsync or man squeue, answers all questions.

Spring_2022
Tue Aug 30 09:57:53 EDT 2022
```

Question 5:

```
ece-000_[1]: sd $HOME/.ssh
/home/tuo54571/.ssh
ece-000_[1]: ls -l
total 0
-rw-------. 1 tuo54571 ece_1111 0 May 23 07:32 authorized_keys
```