CYSE 270: Linux System for Cybersecurity
Week 9: Lab 8 – <mark>Shell Scripting</mark>
(Total 100 Points)

Please refer to the slides for **week 8 - Shell scripting** and write shell scripts to complete the following tasks. **Submit the screenshot for the script and its output, both.**

NOTE: Please replace the name of the script with the name you used for the script. In the sample screenshot, I have used those names to create my script.

Step-1: Use vi or nano editor to write your script (Ex, **vi YourScriptName.sh**) for the following tasks.

Step-2: After saving the script, **save and exit out of the editor** and make the script executable by adding execute permission (**chmod +x YourScriptName.sh**)

Step-3: Run your script using **./YourScriptName.sh**

<mark>Task A</mark>: <u>Conditional Statement</u>
Correct script (25 points) + result/output after executing the script (25 points)-

Write a shell script using nano or vi editor (eg, vi scriptname.sh) like below, that performs the following task:

1. Add the **Shebang** (#!/bin/bash) as the first line in your script.

```
(carl-lochstampfor kali)-[~]
$ vi TaskA.sh
```

```
File  Actions  Edit  View  Help
 1 #!/bin/bash
 2 # TaskA.sh
```

```
(carl-lochstampfor kali)-[~]
$ sudo chmod +x TaskA.sh
[sudo] password for carl-lochstampfor:
```

2. **Read** a number using **read** function. (*Disregard the typo at the top. It was corrected later*)

```
#!/bin/bash
# TasA.sh

echo "Enter a number"
read user_number

echo "You entered: $user_number."
```

```
(carl-lochstampfor kali)-[~]
$ ./TaskA.sh
Enter a number
10
You entered: 10.

(carl-lochstampfor kali)-[~]
$ ./TaskA.sh
Enter a number
36
You entered: 36.
```

3. Using **if statement**, check if the input number is greater than 10, then print the message **"Input number is greater than 10"**.

```
1 #!/bash
2 # TaskA.sh
3
4 echo -n "Please enter a number: "; read user_number
5
6 if (( user_number > 10)); then
7         echo "Your input of $user_number is greater than 10."
8 elif (( user_number == 10 )); then
9         echo "Your input of $user_number is EQUAL to 10."
10 else
11        echo "Your input of $user_number is LESS than 10."
12 fi
```

```
┌──(carl-lochstampfor㊹kali)-[~]
└─$ ./TaskA.sh
Please enter a number: 3
Your input of 3 is LESS than 10.

┌──(carl-lochstampfor㊹kali)-[~]
└─$ ./TaskA.sh
Please enter a number: 10
Your input of 10 is EQUAL to 10.

┌──(carl-lochstampfor㊹kali)-[~]
└─$ ./TaskA.sh
Please enter a number: 32322
Your input of 32322 is greater than 10.
```

4. If the number is not greater than 10, then print the message, "**Input number is not greater than 10**".

(Your script should result into the output similar to this sample screenshot after executing as shown below)

```
┌──(cyse270⊛CYSE270)-[~]
└─$ ./TaskA.sh
Enter the number to check:
9
Input number is not greater than 10.

┌──(cyse270⊛CYSE270)-[~]
└─$ ./TaskA.sh
Enter the number to check:
11
Input number is greater than 10.
```

```
1 #!/bash
2 # TaskA.sh
3
4 echo -n "Please enter a number: "; read user_number
5
6 if (( user_number > 10)); then
7         echo "Your input of $user_number is greater than 10."
8 elif (( user_number = 10 )); then
9         echo "Your input of $user_number is EQUAL to 10."
10 else
11         echo "Your input of $user_number is LESS than 10."
12 fi
```

```
┌──(carl-lochstampfor⊛kali)-[~]
└─$ ./TaskA.sh
Please enter a number: 3
Your input of 3 is LESS than 10.

┌──(carl-lochstampfor⊛kali)-[~]
└─$ ./TaskA.sh
Please enter a number: 10
Your input of 10 is EQUAL to 10.

┌──(carl-lochstampfor⊛kali)-[~]
└─$ ./TaskA.sh
Please enter a number: 32322
Your input of 32322 is greater than 10.
```

Task B: Shell Script to Create a new file

Correct script (25 points) + result/output after executing the script (25 points)

Write a shell script using nano or vi editor (eg, nano scriptname.sh) like below, that performs the following task:

1. Add the **Shebang** (#!/bin/bash) as the first line in your script.

2. **Reads** the **name** of the file to check for a filename that exists.

```
1 #!/bin/bash
2 # TaskB.sh
3
4 echo "Please enter the file name: "
5 read filename_check
6
7 if [ -f "$filename_check" ]; then
8         echo "$filename_check is correct because it exists."
9 else
10        echo "$filename_check is INCORRECT because it does NOT exist."
11 fi
```

```
┌──(carl-lochstampfor㊉kali)-[~]
└─$ ./TaskB.sh
Please enter the file name:
TaskA.sh
TaskA.sh is correct because it exists.

┌──(carl-lochstampfor㊉kali)-[~]
└─$ ./TaskB.sh
Please enter the file name:
TaskX.sh
TaskX.sh is INCORRECT because it does NOT exist.
```

3. Check whether the given input is a directory or regular file.

```
 1 #!/bin/bash
 2 # TaskB.sh
 3 # a regular file, or neither
 4
 5 echo -n "Please enter a path (file or directory): "
 6
 7 #Read the path entered by the user in to the 'input_path' variable
 8 read input_path
 9
10 if [ -f "$input_path" ]; then
11         echo "'$input_path' is a regular file."
12 elif [ -d "$input_path" ]; then
13         echo "'$input_path' is a directory."
14 else
15         echo "'input_path' is neither a regular file or directory, or it does NOT exist."
16 fi
```

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): TaskA.sh
'TaskA.sh' is a regular file and it exists.

┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): /bin
'/bin' is a directory and it exists.

┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): /home
'/home' is a directory and it exists.

┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): TaskC.sh
'input_path' is neither a regular file or directory, or it does NOT exist.
```

4. If the input is a directory and exists, then display the message "**Directory exists**".

```
┌──(carl-lochstampfor⊕kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): TaskA.sh
'TaskA.sh' is a regular file and it exists.

┌──(carl-lochstampfor⊕kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): /bin
'/bin' is a directory and it exists.

┌──(carl-lochstampfor⊕kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): /home
'/home' is a directory and it exists.

┌──(carl-lochstampfor⊕kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): TaskC.sh
'input_path' is neither a regular file or directory, or it does NOT exist.
```

5. If the input is a regular file, then display the message "**It is a regular file, and the file exists**" and display the contents of the file.

```
 1 #!/bin/bash
 2 # TaskB.sh
 3 # a regular file, or neither
 4
 5 echo -n "Please enter a path (file or directory): "
 6
 7 #Read the path entered by the user in to the 'input_path' variable
 8 read input_path
 9
10 if [ -f "$input_path" ]; then
11         echo "'$input_path' is a regular file and it exists."
12         echo
13         echo "Contents of the file, '$input_path':"
14         echo
15         cat "$input_path"
16 elif [ -d "$input_path" ]; then
17         echo "'$input_path' is a directory and it exists."
18 else
19         echo "'input_path' is neither a regular file or directory, or it does NOT exist."
20 fi
```

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): TaskB.sh
'TaskB.sh' is a regular file and it exists.

Contents of the file, 'TaskB.sh':

#!/bin/bash
# TaskB.sh
# a regular file, or neither

echo -n "Please enter a path (file or directory): "

#Read the path entered by the user in to the 'input_path' variable
read input_path

if [ -f "$input_path" ]; then
        echo "'$input_path' is a regular file and it exists."
        echo
        echo "Contents of the file, '$input_path':"
        echo
        cat "$input_path"
elif [ -d "$input_path" ]; then
        echo "'$input_path' is a directory and it exists."
else
        echo "'input_path' is neither a regular file or directory, or it does NOT exist."
fi
```

6. **If the given input name in step-1 doesn't exist**, then create the new file with the given name in step-1.

In other words, choose a file name that doesn't exist, run the TaskB.sh script to show it doesn't exist, then create that file and then rerun the TaskB.sh to verify the new file NOW exists (which it should). I started in Step 1 with 'TaskX.sh', but change it to 'TaskC.sh'.

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): TaskC.sh
'input_path' is neither a regular file or directory, or it does NOT exist.

┌──(carl-lochstampfor㉿kali)-[~]
└─$ vi TaskC.sh

┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./TaskB.sh
Please enter a path (file or directory): TaskC.sh
'TaskC.sh' is a regular file and it exists.

Contents of the file, 'TaskC.sh':

#!bin/bash
#TaskC.sh

echo -n "This file now exists."
```

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ vi TaskC.sh
```

```
1 #!/bin/bash
2 #TaskC.sh
3
4 echo -n "This file now exists."
5
```

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ls TaskC.sh
TaskC.sh
```

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ sudo chmod +x TaskC.sh
```

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./TaskC.sh
This file now exists.
```

Extra credit: 10 points

Add your name to the file (using redirection operator '>') and display the contents for the newly created file.

1. Save and exit the editor and remember to make the script executable using the command **chmod +x scriptname.sh**)

Your script should result into the output similar to this sample screenshot after executing as shown below.

```
┌──(cyse270㉿CYSE270)-[~/Desktop]
└─$ ./TaskB_withExtra.sh
Enter the filename to check:
test.txt
It is a regular file, and the file exists
┌──(cyse270㉿CYSE270)-[~/Desktop]
└─$ ./TaskB_withExtra.sh
Enter the filename to check:
lab8_example.txt
It is a regular file, and the file exists
The contents of the file are:
Mohammed Al kinoon!
```

```bash
1 #!/bin/bash
2 # TaskB_ExtraCredit.sh
3 # a regular file, or neither
4
5 echo -n "Please enter a path (file or directory): "
6
7 #Read the path entered by the user in to the 'input_path' variable
8 read input_path
9
10 if [ -f "$input_path" ]; then
11         echo "'$input_path' is a regular file and it exists."
12         echo
13         echo "The contents of the file, '$input_path', are:"
14         echo
15         cat "$input_path"
16 elif [ -d "$input_path" ]; then
17         echo "'$input_path' is a directory and it exists."
18 else
19         echo "'input_path' is neither a regular file or directory, or it does NOT exist."
20 fi
21
```

```
┌──(carl-lochstampfor⊛ kali)-[~]
└─$ sudo chmod +x TaskB_ExtraCredit.sh
[sudo] password for carl-lochstampfor:
```

```
┌──(carl-lochstampfor⊛ kali)-[~]
└─$ touch test_file.txt
```

```
┌──(carl-lochstampfor⊛ kali)-[~]
└─$ cat test_file.txt

┌──(carl-lochstampfor⊛ kali)-[~]
└─$ ./TaskB_ExtraCredit.sh
Please enter a path (file or directory): test_file.txt
'test_file.txt' is a regular file and it exists.

The contents of the file, 'test_file.txt', are:


┌──(carl-lochstampfor⊛ kali)-[~]
└─$
```

```
┌──(carl-lochstampfor⊛ kali)-[~]
└─$ echo "Carl Lochstampfor" > test_file.txt

┌──(carl-lochstampfor⊛ kali)-[~]
└─$ cat test_file.txt
Carl Lochstampfor
```

```
┌──(carl-lochstampfor⊛ kali)-[~]
└─$ ./TaskB_ExtraCredit.sh
Please enter a path (file or directory): test_file.txt
'test_file.txt' is a regular file and it exists.

The contents of the file, 'test_file.txt', are:
Carl Lochstampfor

┌──(carl-lochstampfor⊛ kali)-[~]
└─$
```

Extra Credit (15 points):
Check Directory

Write a script like below that

1. Reads Two variables- your name and the name of the directory as input.

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ vi Lab8_Extra2.sh

┌──(carl-lochstampfor㉿kali)-[~]
└─$ sudo chmod +x Lab8_Extra2.sh
[sudo] password for carl-lochstampfor:
```

```bash
 1 #!/bin/bash
 2 # Lab8_Extra2.sh
 3
 4 echo -n "Please enter your name: "   ✗
 5 read user_name
 6
 7 echo -n "Enter the directory name to check: "   ✗
 8 read directory_name
 9
10 echo
11
12 echo "Hello, $user_name! The directory you provided is $directory_name."
13
```

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./Lab8_Extra2.sh
Please enter your name: Carl
Enter the directory name to check: /bin

Hello, Carl! The directory you provided is /bin.
```

2. Your script should check for the validity of the given directory name, if the entered filename is a directory, then display its contents.

```bash
1 #!/bin/bash
2 # Lab8_Extra2.sh
3
4 echo -n "Please enter your name: "
5 read user_name
6
7 echo -n "Enter the directory name to check: "
8 read directory_name
9 echo
10
11 echo "Hello, $user_name! The directory you provided is $directory_name."
12 echo
13
14 if [ -d $directory_name ]; then
15         echo "$directory_name is a valid directory that exists on this computer."
16         echo
17         echo "The contents of the $directory_name directory are:"
18         ls "$directory_name"
19 elif [ -f $directory_name ]; then
20         echo "$directory_name exists, but it is a regular file, not a valid directory name."
21 else
22         echo "Sorry, $directory_name is NOT a valid directory name or it does NOT exist on this computer. Try again."
23
24 fi
```

3. If the directory doesn't exist, then print an error message "Sorry, the entered directory name is not a valid directory name."

```bash
1 #!/bin/bash
2 # Lab8_Extra2.sh
3
4 echo -n "Please enter your name: "
5 read user_name
6
7 echo -n "Enter the directory name to check: "
8 read directory_name
9 echo
10
11 echo "Hello, $user_name! The directory you provided is $directory_name."
12 echo
13
14 if [ -d $directory_name ]; then
15         echo "$directory_name is a valid directory that exists on this computer."
16         echo
17         echo "The contents of the $directory_name directory are:"
18         ls "$directory_name"
19 elif [ -f $directory_name ]; then
20         echo "$directory_name exists, but it is a regular file, not a valid directory name."
21 else
22         echo "Sorry, $directory_name is NOT a valid directory name or it does NOT exist on this computer. Try again."
23
24 fi
```

4. You need to execute your script and test the following directories to test with your script. *I added '-l' to 'ls' to prevent the text lines from running far to the right for viewing ease.*

- /etc/system
- /home
- A directory that does not exist.

<u>Display the contents for the directories you have entered.</u> *See the screenshot below where the script has been executed 3 times to check for the Three different directory names as the test input.*

```
┌──(cyse270㊉CYSE270)-[~/Desktop]
└─$ ./lab8_extra_credit.sh
Enter your name:
Mohammed
Enter the directory name to check:
/etc/systemd
Hello, Mohammed. The contents of the directory '/etc/systemd' are:
journald.conf  logind.conf  network  networkd.conf  pstore.conf  sleep.conf  system  system.conf  timesyncd.conf  user  user.conf
Mohammed
Enter the directory name to check:
/home
Hello, Mohammed. The contents of the directory '/home' are:
bob  cyse270  data  julia  susan
```

```
┌──(cyse270㊉CYSE270)-[~/Desktop]
└─$ ./lab8_extra_credit.sh
Enter your name:
Mohammed
Enter the directory name to check:
/fake_directory
Sorry, the entered directory name is not a valid directory name.
```

16

- /etc/systemd

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./Lab8_Extra2.sh
Please enter your name: Stone Cold Steve Austin
Enter the directory name to check: /etc/systemd

Hello, Stone Cold Steve Austin! The directory you provided is /etc/systemd.

/etc/systemd is a valid directory that exists on this computer.

The contents of the /etc/systemd directory are:
total 44
-rw-r--r--  1 root root 1429 Jan  7 15:45 journald.conf
-rw-r--r--  1 root root 1785 Jan 23 10:17 logind.conf
drwxr-xr-x  2 root root 4096 May 21 18:48 network
-rw-r--r--  1 root root 1213 Jan  7 15:45 networkd.conf
-rw-r--r--  1 root root  879 Jan  7 15:45 pstore.conf
-rw-r--r--  1 root root 1102 Jan  7 15:45 sleep.conf
drwxr-xr-x 11 root root 4096 May 21 18:53 system
-rw-r--r--  1 root root 2342 Jan 23 10:17 system.conf
-rw-r--r--  1 root root 1076 Jan 23 10:17 timesyncd.conf
drwxr-xr-x  6 root root 4096 May 21 18:52 user
-rw-r--r--  1 root root 1768 Jan 23 10:17 user.conf
```

- /home

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./Lab8_Extra2.sh
Please enter your name: Carl Lochstampfor
Enter the directory name to check: /home

Hello, Carl Lochstampfor! The directory you provided is /home.

/home is a valid directory that exists on this computer.

The contents of the /home directory are:
total 12
drwx------- 19 carl-lochstampfor carl-lochstampfor 4096 Jul  8 14:52 carl-lochstampfor
drwxrws--T  2 root              cloch001          4096 Jun 28 20:07 cyse_project
drwxr-xr-x  5 root              root              4096 Jun 28 10:04 etc
-rw-r--r--  1 root              root                 0 Jun 28 20:06 Sophia_homework3
```

- A directory that does not exist

```
┌──(carl-lochstampfor㉿kali)-[~]
└─$ ./Lab8_Extra2.sh
Please enter your name: The Undertaker
Enter the directory name to check: Graveyard

Hello, The Undertaker! The directory you provided is Graveyard.

Sorry, Graveyard is NOT a valid directory name or it does NOT exist on this computer. Try again.

┌──(carl-lochstampfor㉿kali)-[~]
└─$
```