

LAB #03

SHELL Programming (Part II)



Spring 2023

CSE-204L Operating Systems Lab

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Section: C

“On my honor, as a student of the University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work”

Submitted to:

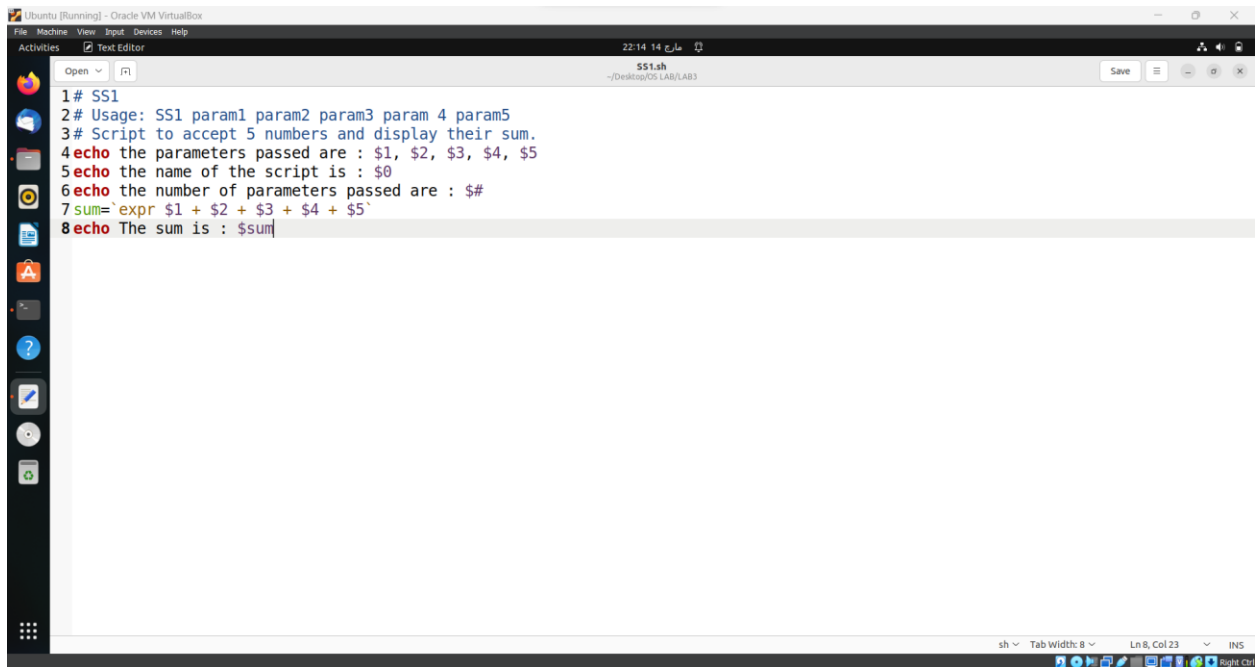
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(13 Mar 2023)

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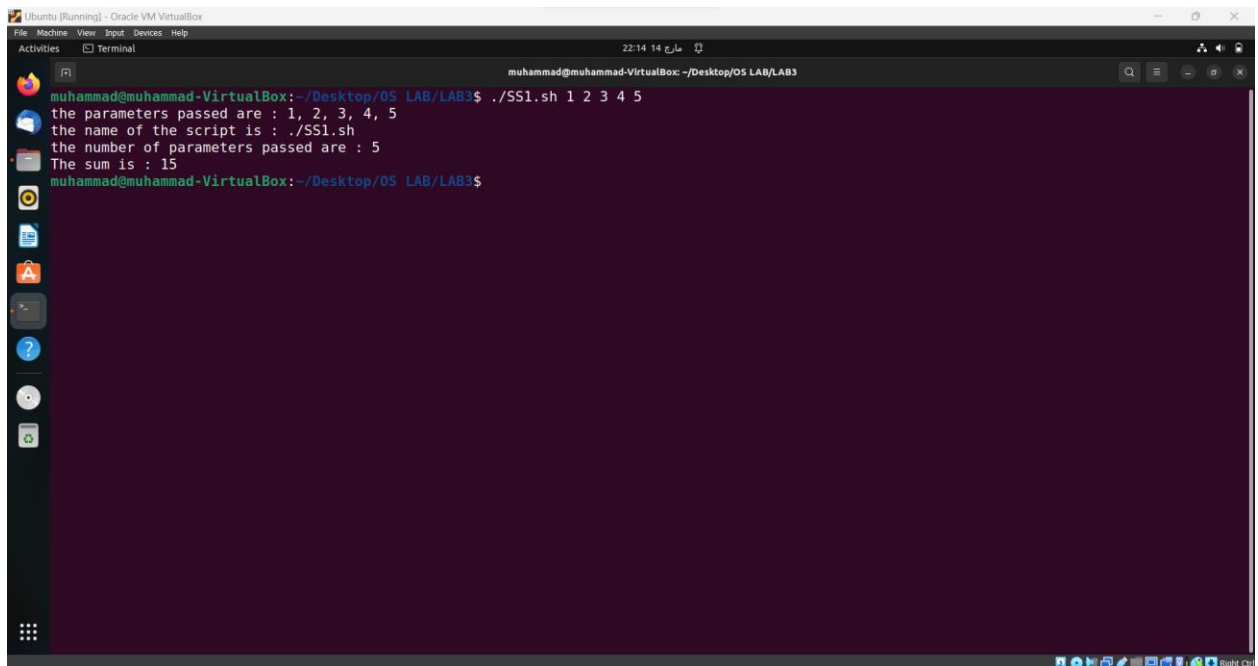
1. Run all the programs given in the Lab Notes, and observe the output for each program.

SS1



A screenshot of a text editor window titled "SS1.sh" located at "~Desktop/OS LAB/LAB3". The editor contains the following script:

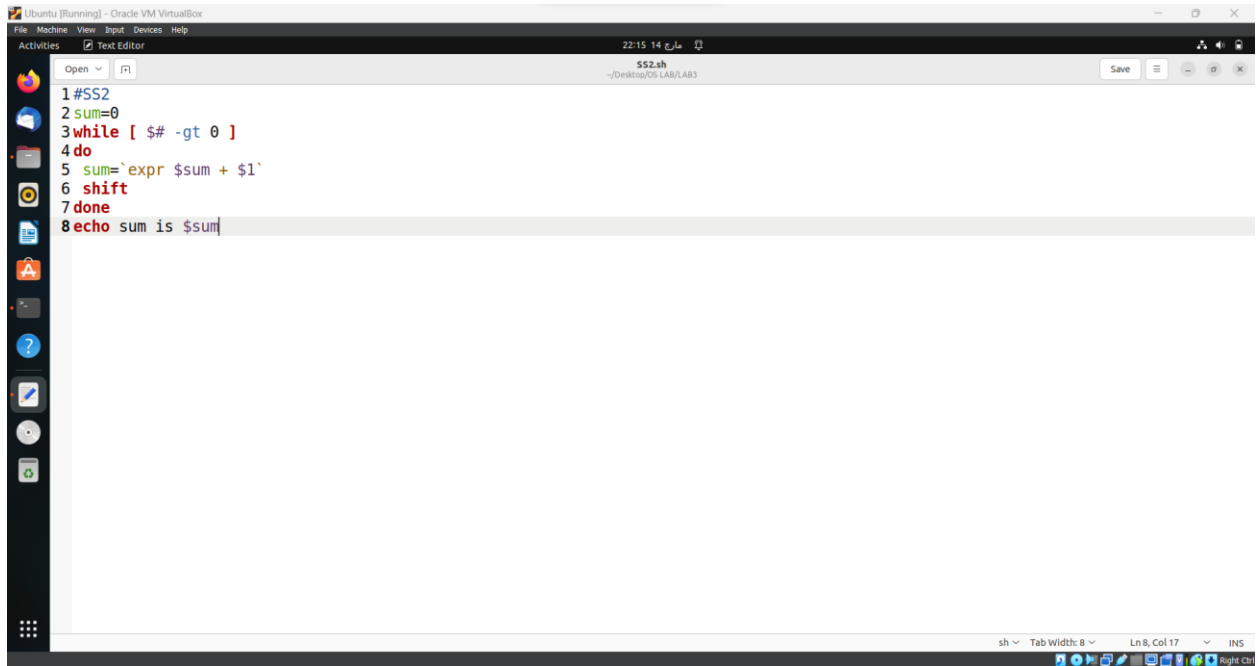
```
1# SS1
2# Usage: SS1 param1 param2 param3 param 4 param5
3# Script to accept 5 numbers and display their sum.
4echo the parameters passed are : $1, $2, $3, $4, $5
5echo the name of the script is : $0
6echo the number of parameters passed are : $#
7sum=`expr $1 + $2 + $3 + $4 + $5`
8echo The sum is : $sum
```



A screenshot of a terminal window titled "muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3". The terminal shows the execution of the script with the command `./SS1.sh 1 2 3 4 5`. The output is as follows:

```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$ ./SS1.sh 1 2 3 4 5
the parameters passed are : 1, 2, 3, 4, 5
the name of the script is : ./SS1.sh
the number of parameters passed are : 5
The sum is : 15
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

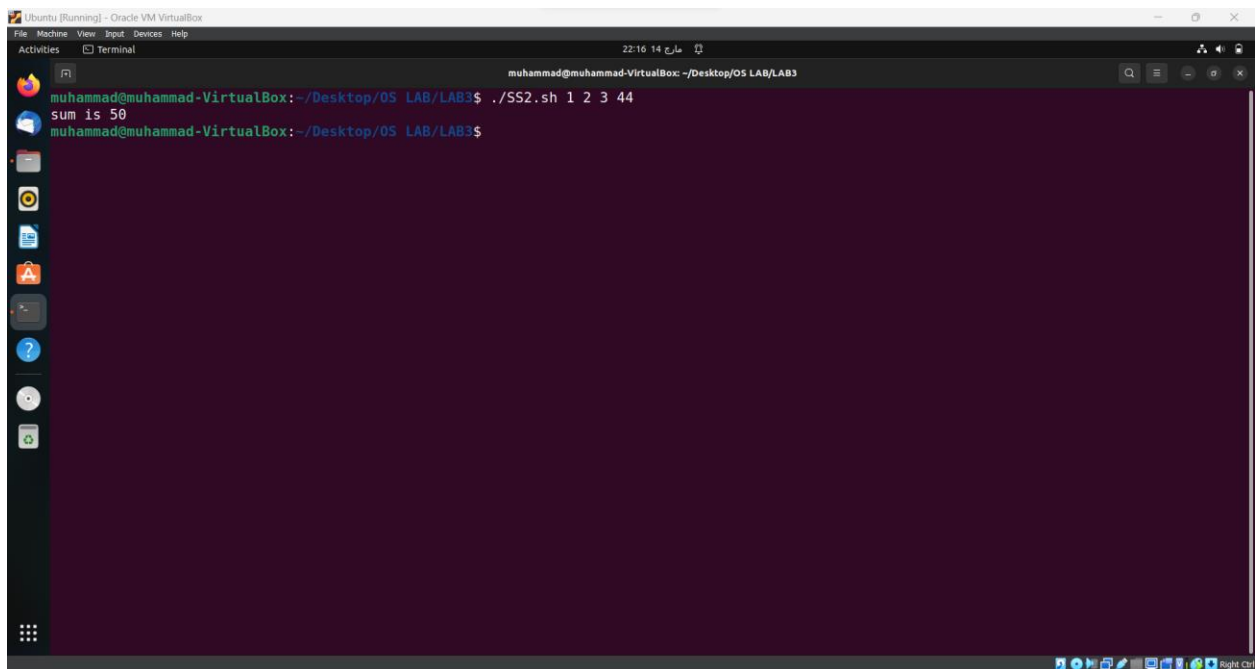
SS2



A screenshot of a text editor window titled "SS2.sh" located at "~/Desktop/OS LAB/LAB3". The editor contains a shell script with the following content:

```
1 #SS2
2 sum=0
3 while [ $# -gt 0 ]
4 do
5   sum=`expr $sum + $1`
6   shift
7 done
8 echo sum is $sum
```

The window's status bar at the bottom indicates "sh", "Tab Width: 8", "Ln 8, Col 17", and "INS".

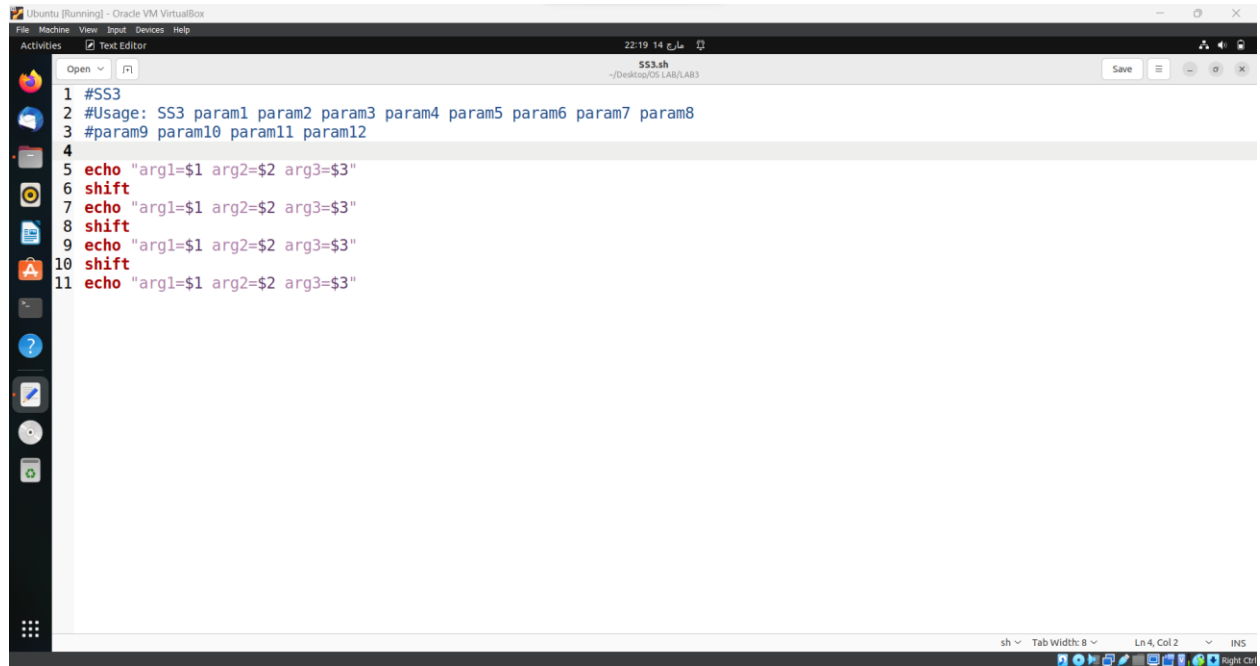


A screenshot of a terminal window titled "muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3". The terminal shows the execution of the script with the following output:

```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$ ./SS2.sh 1 2 3 44
sum is 50
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

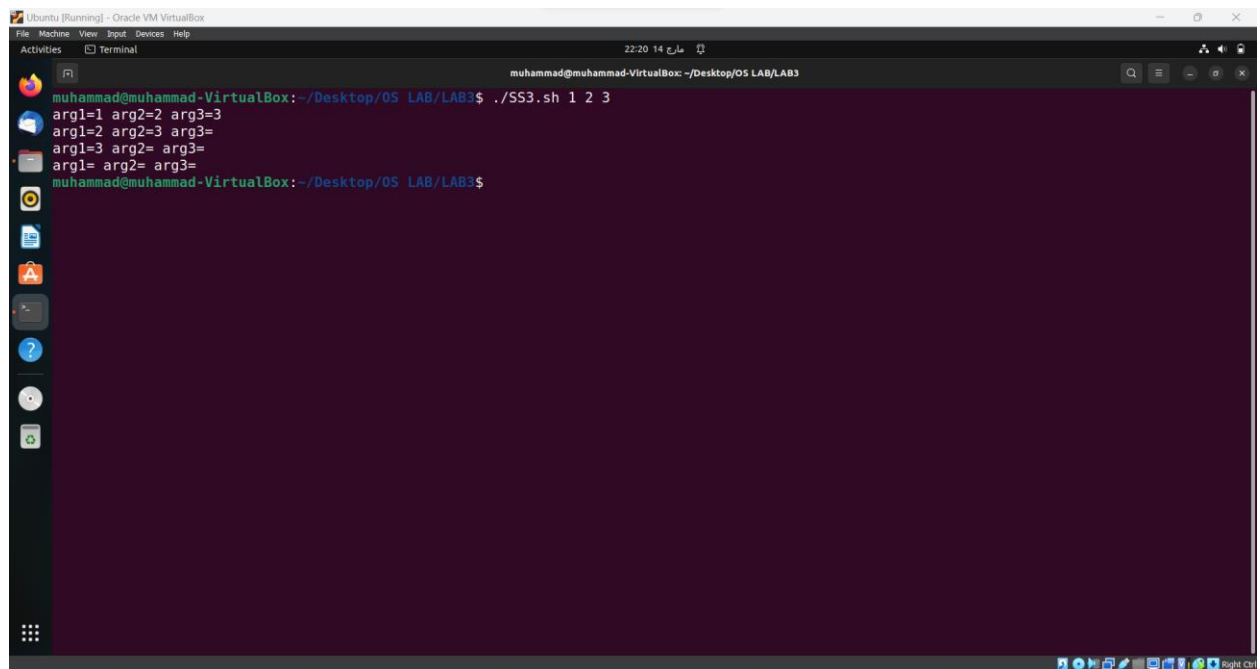
The terminal window's status bar at the bottom indicates "Right Ctrl".

SS3



This screenshot shows a text editor window titled "SS3.sh" located at the path ~/Desktop/OS LAB/LAB3. The script contains 11 lines of code. Lines 1-3 are comments. Lines 5-11 are a loop that prints "arg1= arg2= arg3=" three times, with the values of the arguments shifting to the right in each iteration. The editor has a menu bar with "File", "Machine", "View", "Input", "Devices", and "Help". The status bar at the bottom shows "sh", "Tab Width: 8", "Ln: 4, Col: 2", and "INS".

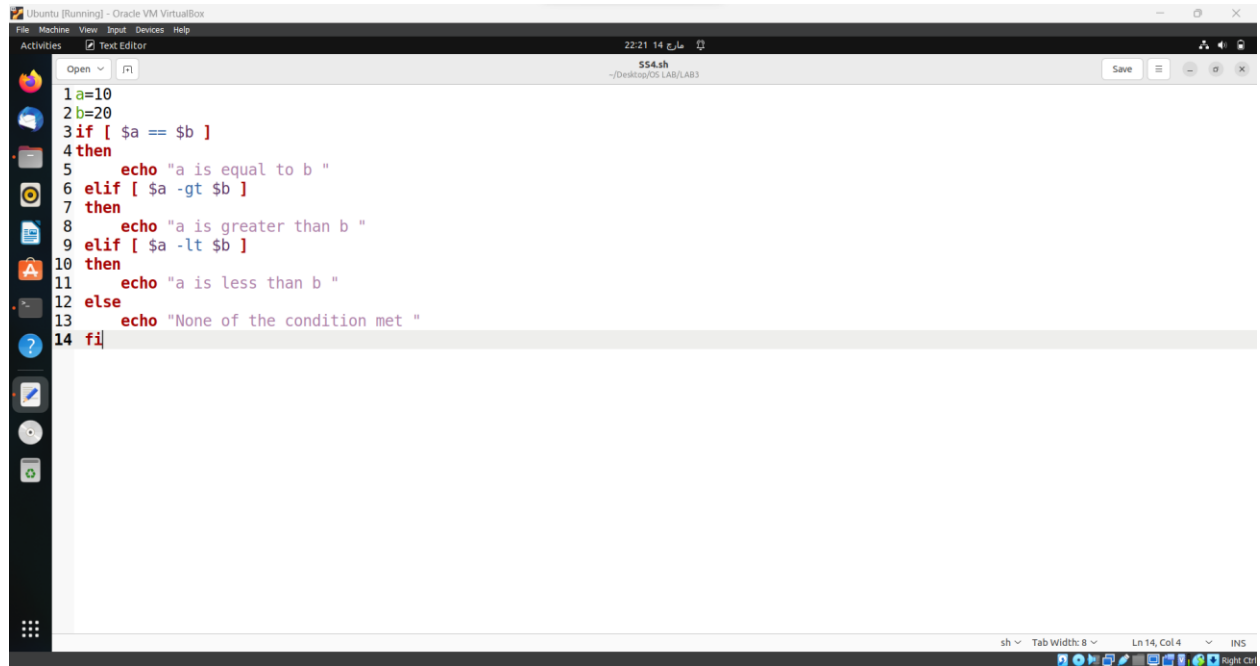
```
1 #SS3
2 #Usage: SS3 param1 param2 param3 param4 param5 param6 param7 param8
3 #param9 param10 param11 param12
4
5 echo "arg1=$1 arg2=$2 arg3=$3"
6 shift
7 echo "arg1=$1 arg2=$2 arg3=$3"
8 shift
9 echo "arg1=$1 arg2=$2 arg3=$3"
10 shift
11 echo "arg1=$1 arg2=$2 arg3=$3"
```



This screenshot shows a terminal window titled "muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3". The user has executed the command `./SS3.sh 1 2 3`. The output shows the arguments being shifted: `arg1=1 arg2=2 arg3=3`, `arg1=2 arg2=3 arg3=`, and `arg1=3 arg2= arg3=`. The terminal has a menu bar with "File", "Machine", "View", "Input", "Devices", and "Help". The status bar at the bottom shows "Right Ctrl".

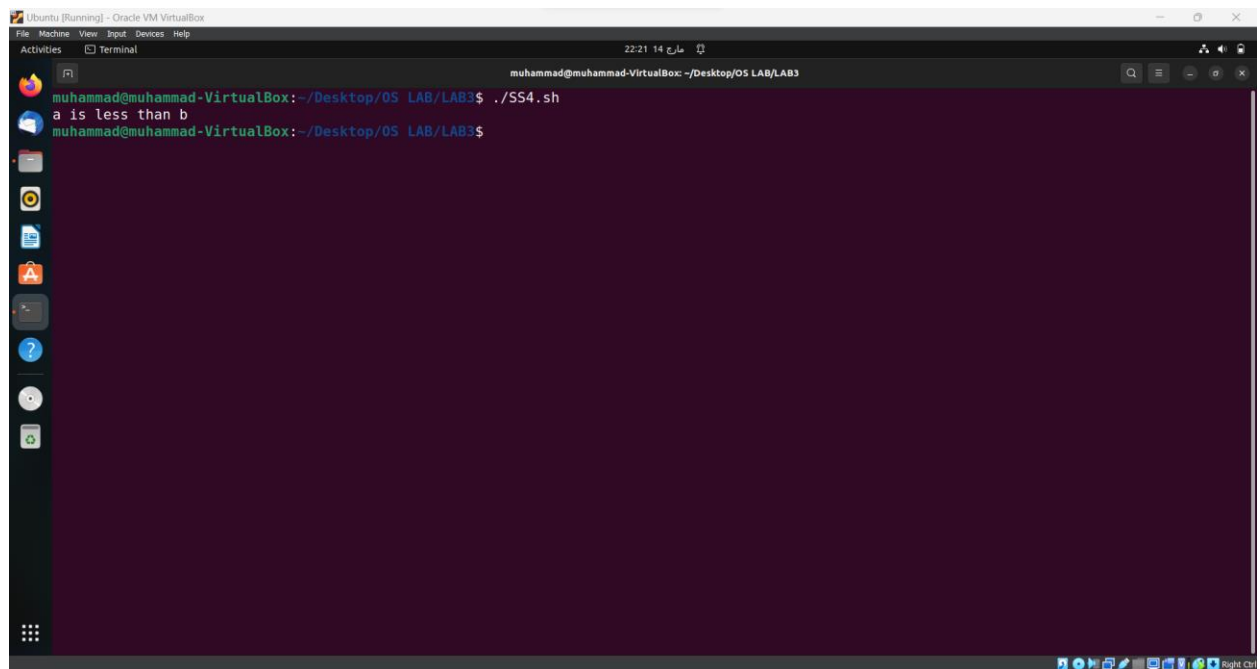
```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$ ./SS3.sh 1 2 3
arg1=1 arg2=2 arg3=3
arg1=2 arg2=3 arg3=
arg1=3 arg2= arg3=
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

SS4



This screenshot shows a text editor window titled "SS4.sh" located at the path ~/Desktop/OS LAB/LAB3. The script contains a series of conditional statements to compare the values of variables 'a' and 'b'. The code is as follows:

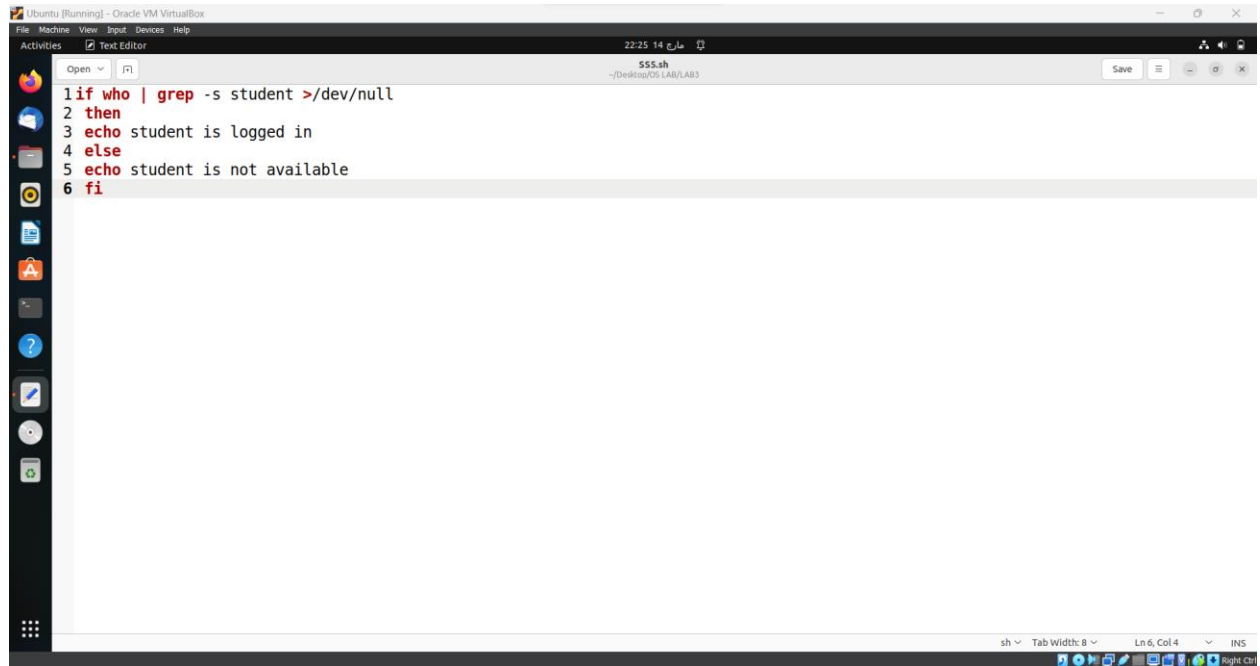
```
1 a=10
2 b=20
3 if [ $a == $b ]
4 then
5     echo "a is equal to b "
6 elif [ $a -gt $b ]
7 then
8     echo "a is greater than b "
9 elif [ $a -lt $b ]
10 then
11     echo "a is less than b "
12 else
13     echo "None of the condition met "
14 fi
```



This screenshot shows a terminal window where the script from the previous image has been executed. The prompt is muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3. The command ./SS4.sh has been entered, and the output "a is less than b" is displayed on the line.

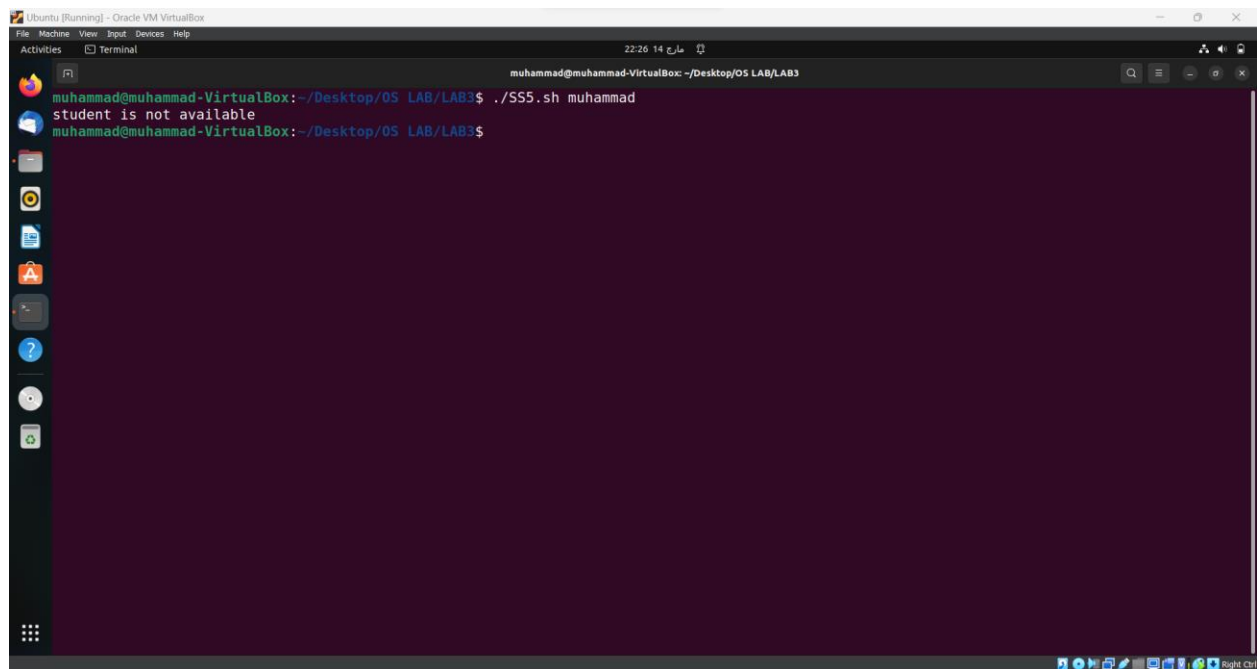
```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$ ./SS4.sh
a is less than b
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

SS5



This screenshot shows a text editor window titled 'SS5.sh' with the file path '~/Desktop/OS LAB/LAB3'. The editor contains a shell script with six lines of code. The script uses an 'if' statement to check if the word 'student' is present in the output of the 'who' command. If it is, it prints 'student is logged in'; otherwise, it prints 'student is not available'.

```
1 if who | grep -s student >/dev/null
2 then
3 echo student is logged in
4 else
5 echo student is not available
6 fi
```



This screenshot shows a terminal window titled 'muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3'. The user has executed the command './SS5.sh muhammad'. The terminal output shows 'student is not available', which is the result of the script's logic applied to the input 'muhammad'.

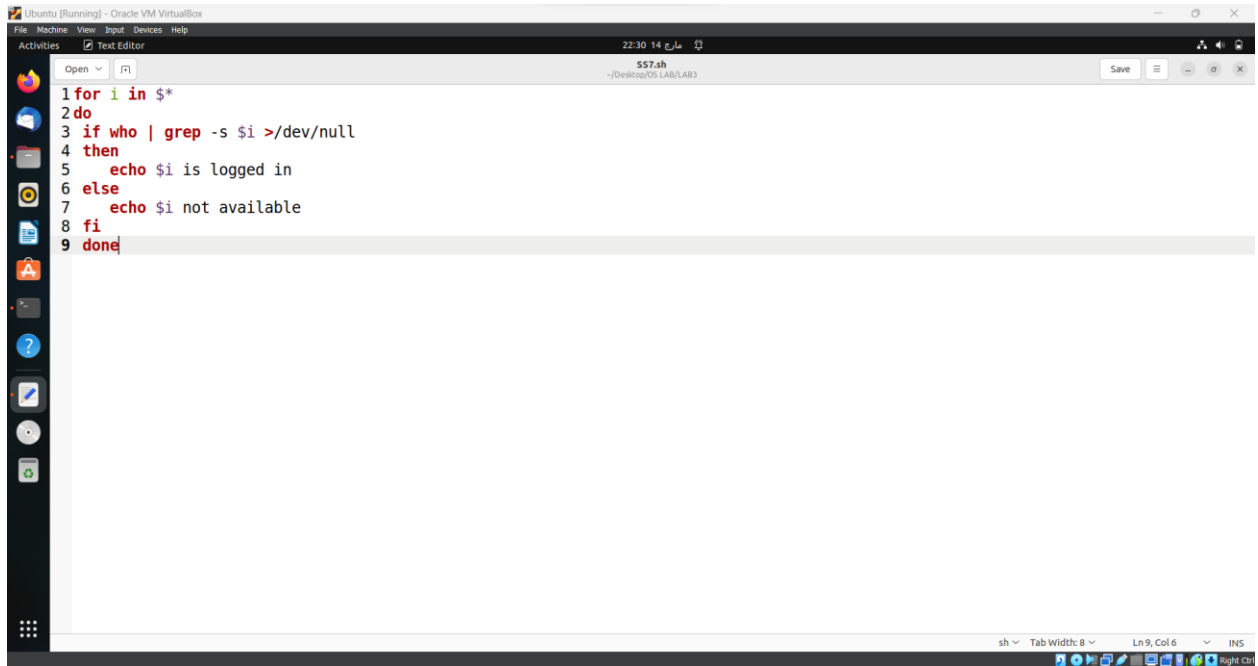
```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$ ./SS5.sh muhammad
student is not available
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

SS6

```
Ubuntu [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Text Editor
22:28 14 مارس
SS6.sh
~/Desktop/OS LAB/LAB3
Save
1 clear
2 echo "1.Date and time "
3 echo
4 echo "2.Directory listing "
5 echo
6 echo "3.users information "
7 echo
8 echo "4.Current Directory "
9 echo
10 echo "Enter choice (1,2,3 or 4) :\c"
11 read choice
12 case $choice in
13 1) date;;
14 2) ls -l;;
15 3) who;;
16 4) pwd;;
17 *) echo wrong choice;;
18 esac
```

```
Ubuntu [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal
22:29 14 مارس
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3
1.Date and time
2.Directory listing
3.users information
4.Current Directory
Enter choice (1,2,3 or 4) :\c
2
total 48
drwxrwxr-x 2 muhammad muhammad 4096 21:52 14 assignment
-rwxrwxrwx 1 muhammad muhammad 164 22:55 13 SS10.sh
-rwxrwxrwx 1 muhammad muhammad 156 22:58 13 SS11.sh
-rwxrwxrwx 1 muhammad muhammad 298 22:13 14 SS1.sh
-rwxrwxrwx 1 muhammad muhammad 84 22:10 14 SS2.sh
-rwxrwxrwx 1 muhammad muhammad 259 22:19 14 SS3.sh
-rwxrwxrwx 1 muhammad muhammad 224 22:21 14 SS4.sh
-rwxrwxrwx 1 muhammad muhammad 110 22:25 14 SS5.sh
-rwxrwxrwx 1 muhammad muhammad 266 22:31 13 SS6.sh
-rwxrwxrwx 1 muhammad muhammad 120 22:39 13 SS7.sh
-rwxrwxrwx 1 muhammad muhammad 181 22:45 13 SS8.sh
-rwxrwxrwx 1 muhammad muhammad 149 22:50 13 SS9.sh
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

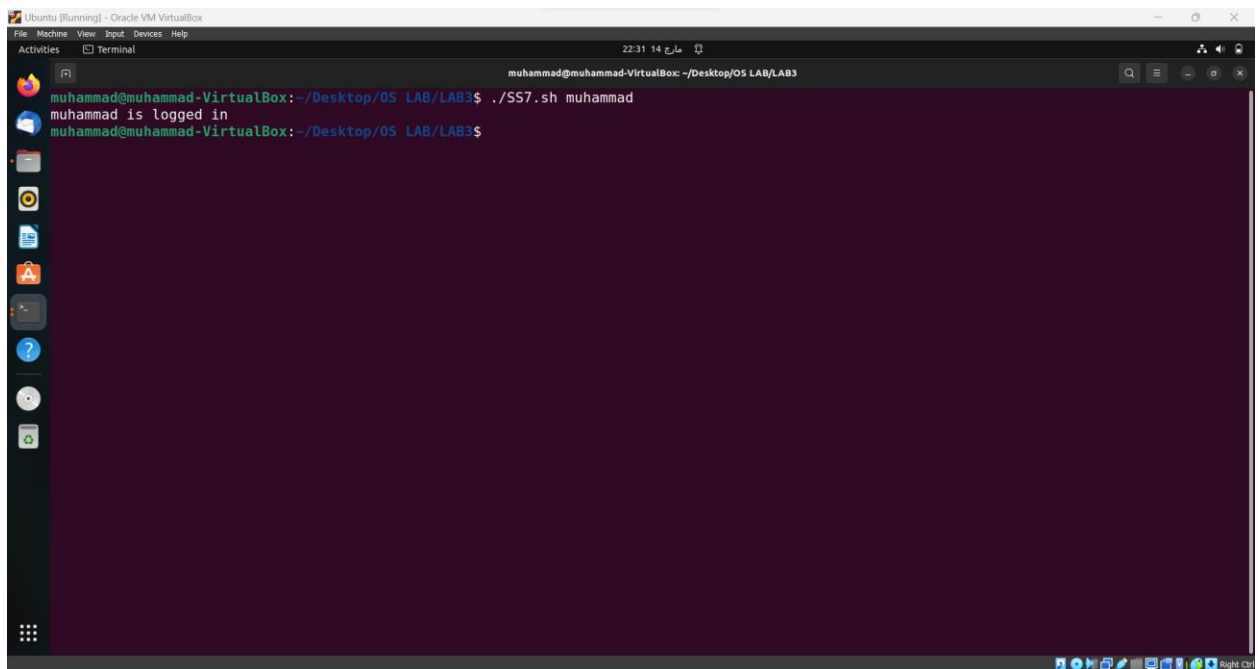
SS7



A screenshot of a text editor window titled "SS7.sh" located at "~/Desktop/OS LAB/LAB3". The editor contains a shell script with the following content:

```
1 for i in $*
2 do
3   if who | grep -s $i >/dev/null
4   then
5     echo $i is logged in
6   else
7     echo $i not available
8   fi
9 done
```

The window's status bar at the bottom indicates "sh", "Tab Width: 8", "Ln 9, Col 6", and "INS".

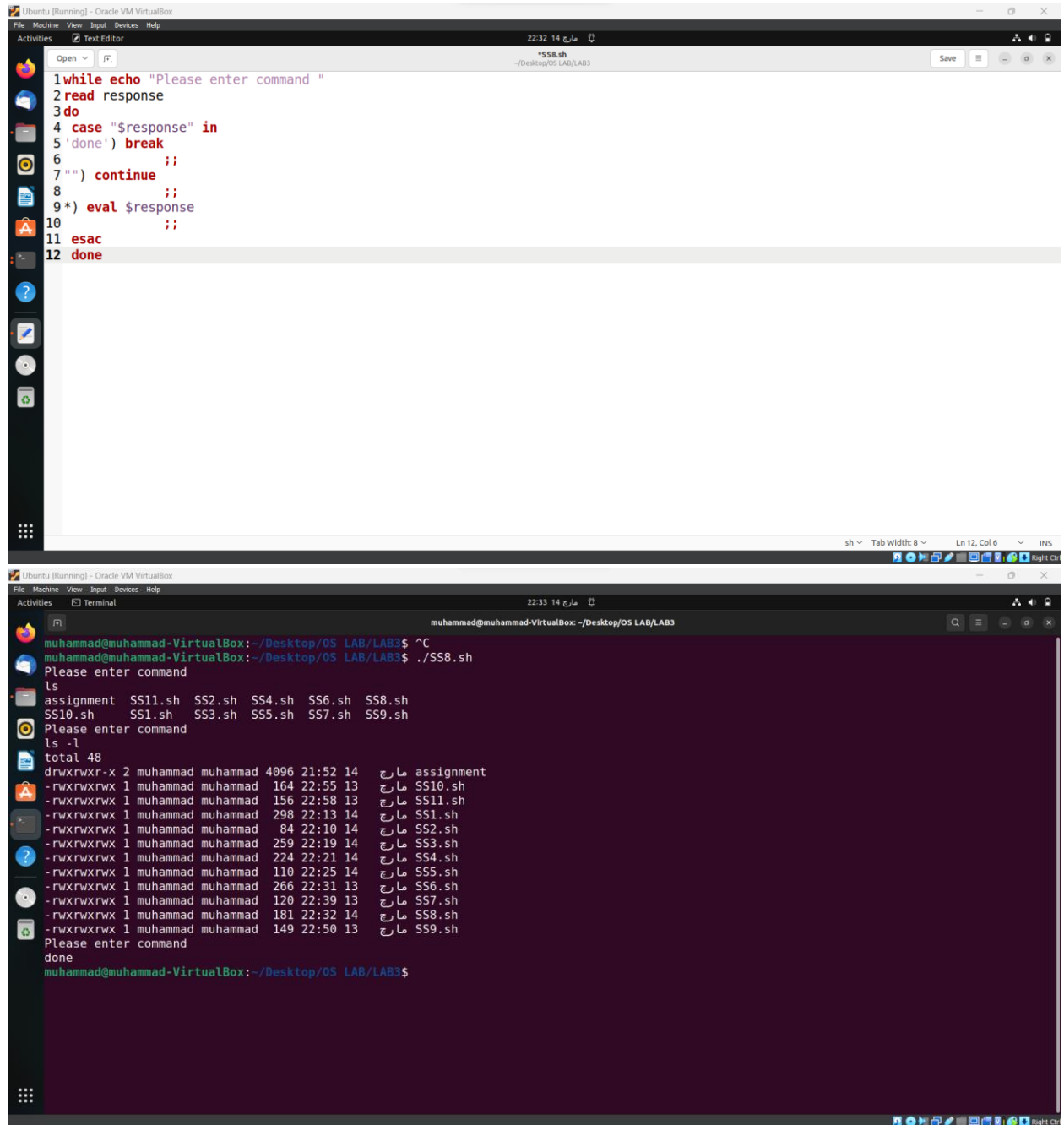


A screenshot of a terminal window titled "muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3". The terminal shows the execution of the script:

```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$ ./SS7.sh muhammad
muhammad is logged in
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

The terminal window's status bar at the bottom indicates "Right Ctrl".

SS8



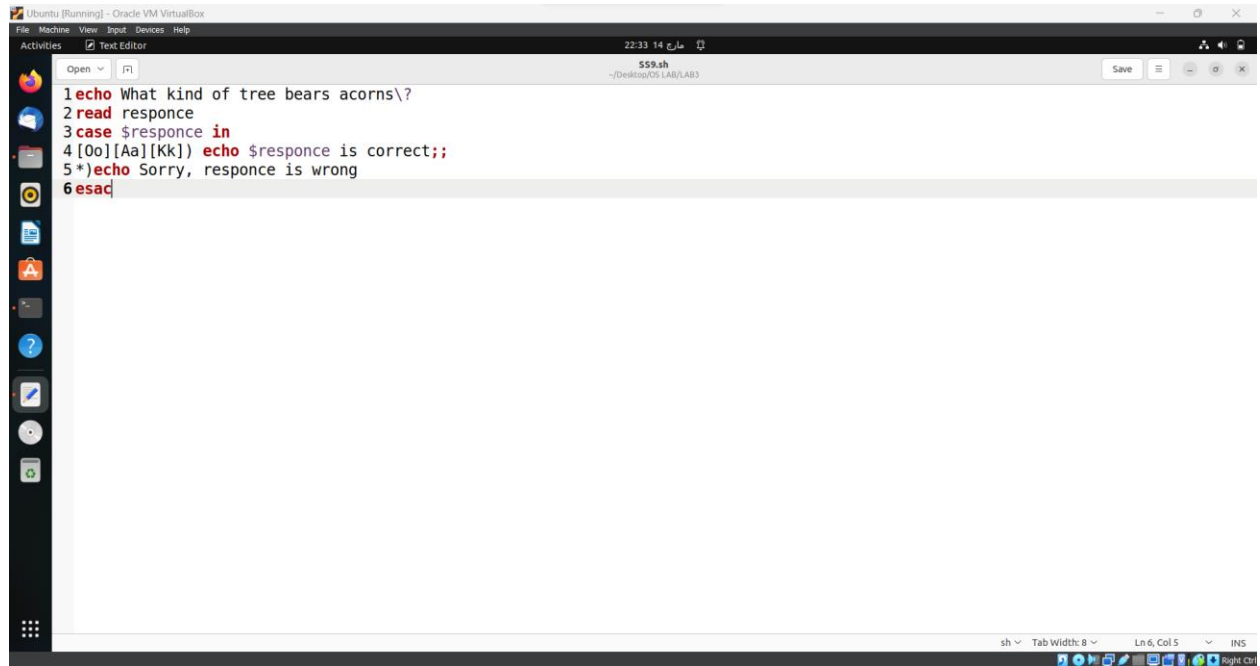
The image shows a virtual machine environment with two windows. The top window is a text editor titled "SS8.sh" containing a shell script. The bottom window is a terminal titled "muhammad@muhammad-VirtualBox" showing the execution of the script.

```
1 while echo "Please enter command "
2 read response
3 do
4 case "$response" in
5 'done') break
6
7 " ") continue ;;
8
9 *) eval $response
10 ;;
11 esac
12 done
```

Terminal output:

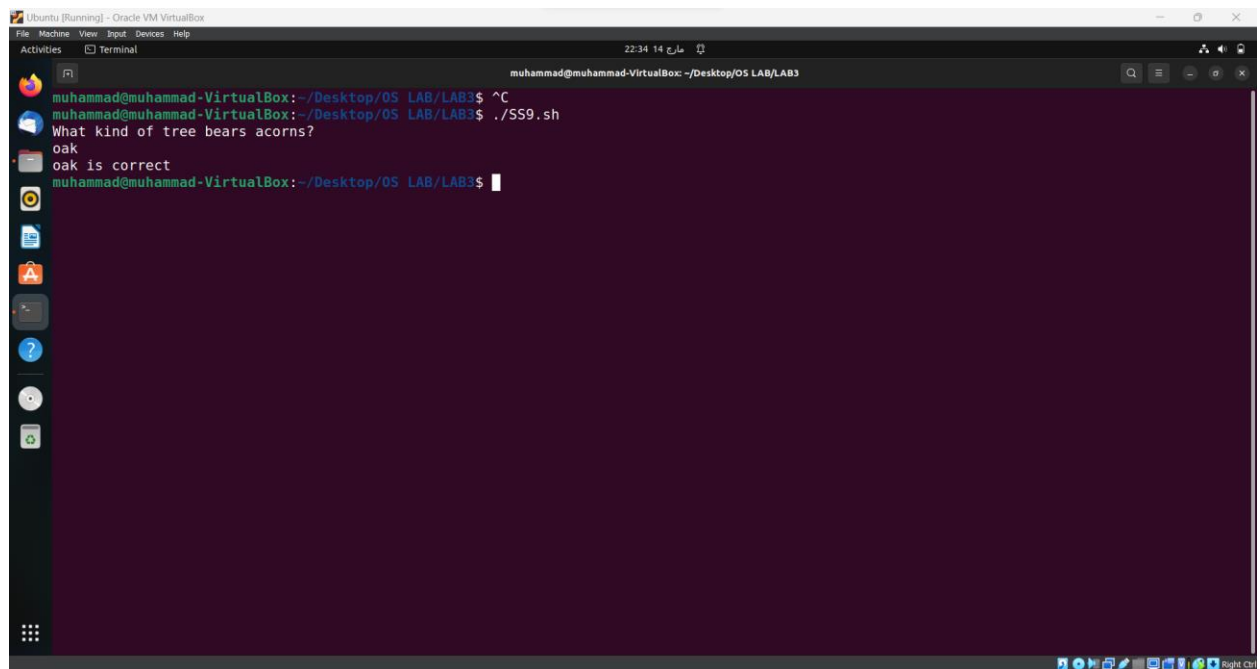
```
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3$ ^C
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3$ ./SS8.sh
Please enter command
ls
assignment  SS11.sh  SS2.sh  SS4.sh  SS6.sh  SS8.sh
SS10.sh    SS1.sh  SS3.sh  SS5.sh  SS7.sh  SS9.sh
Please enter command
ls -l
total 48
drwxrwxr-x 2 muhammad muhammad 4096 21:52 14  assignment
-rwxrwxrwx 1 muhammad muhammad 164 22:55 13  SS10.sh
-rwxrwxrwx 1 muhammad muhammad 156 22:58 13  SS11.sh
-rwxrwxrwx 1 muhammad muhammad 298 22:13 14  SS1.sh
-rwxrwxrwx 1 muhammad muhammad 84 22:10 14  SS2.sh
-rwxrwxrwx 1 muhammad muhammad 259 22:19 14  SS3.sh
-rwxrwxrwx 1 muhammad muhammad 224 22:21 14  SS4.sh
-rwxrwxrwx 1 muhammad muhammad 110 22:25 14  SS5.sh
-rwxrwxrwx 1 muhammad muhammad 266 22:31 13  SS6.sh
-rwxrwxrwx 1 muhammad muhammad 120 22:39 13  SS7.sh
-rwxrwxrwx 1 muhammad muhammad 181 22:32 14  SS8.sh
-rwxrwxrwx 1 muhammad muhammad 149 22:50 13  SS9.sh
Please enter command
done
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3$
```

SS9



This screenshot shows a text editor window titled "SS9.sh" located at the path ~/Desktop/OS LAB/LAB3. The script contains the following code:

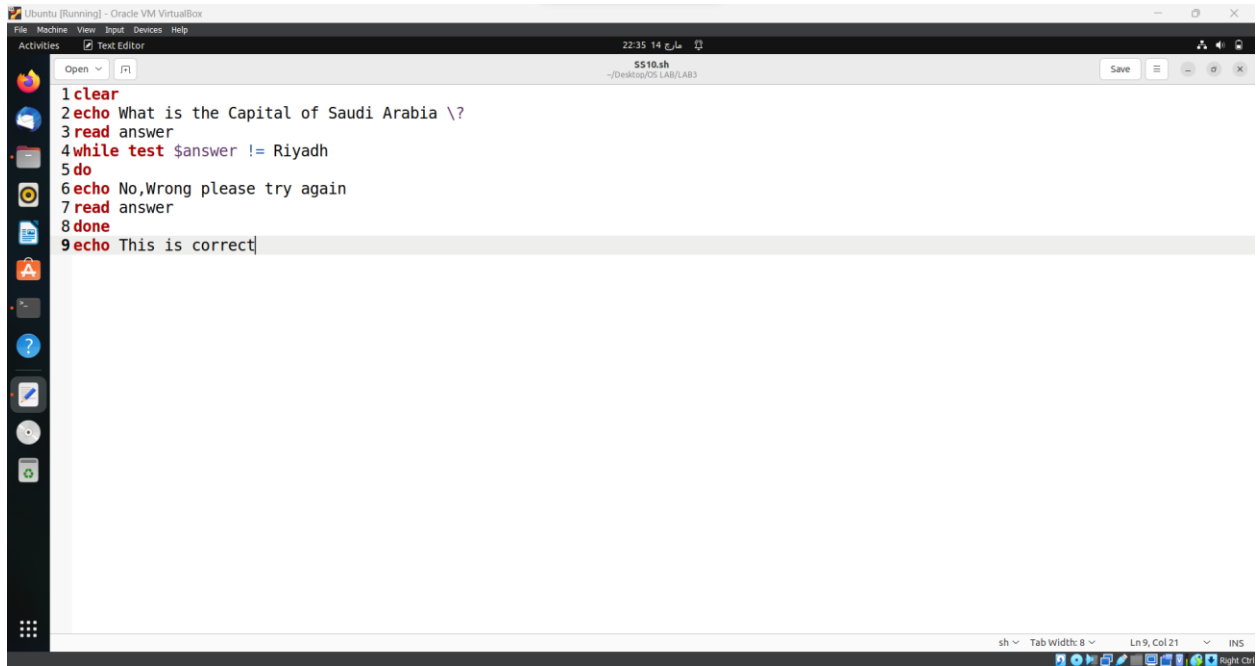
```
1 echo What kind of tree bears acorns\?  
2 read response  
3 case $response in  
4 [Oo][Aa][Kk]) echo $response is correct;;  
5 *) echo Sorry, response is wrong  
6 esac
```



This screenshot shows a terminal window where the script SS9.sh has been executed. The user input "oak" is accepted as correct.

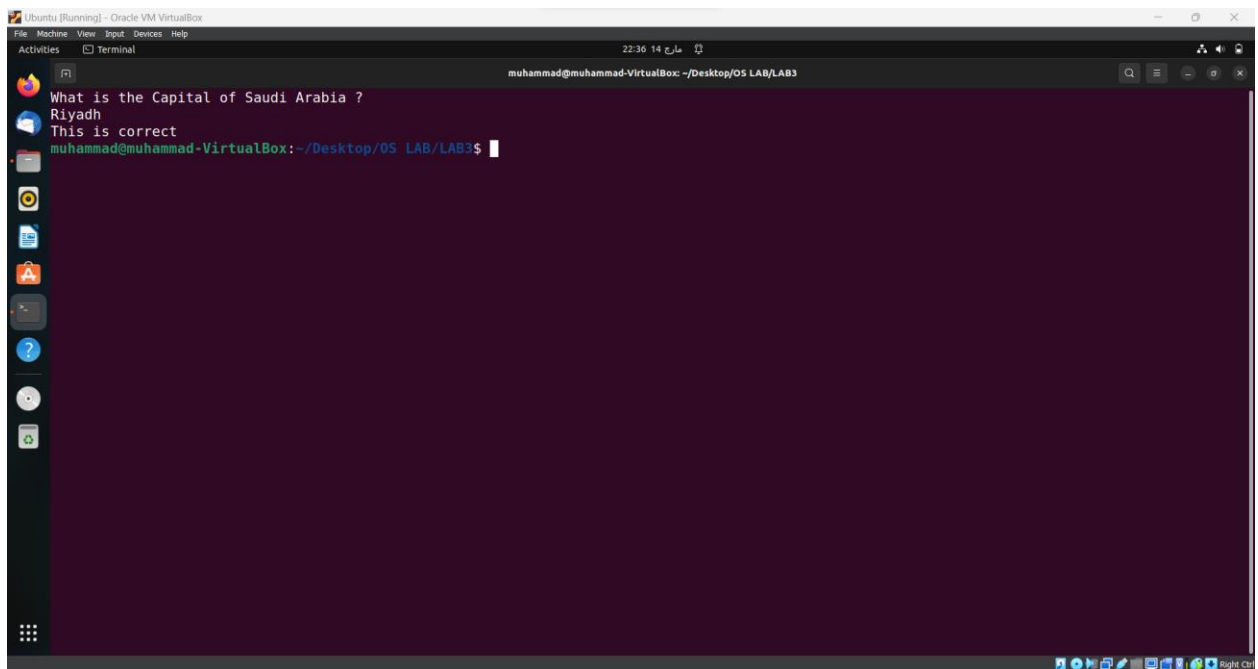
```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$ ^C  
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$ ./SS9.sh  
What kind of tree bears acorns?  
oak  
oak is correct  
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

SS10



This screenshot shows a text editor window titled 'SS10.sh' located at '~/.Desktop/OS LAB/LAB3'. The script contains the following lines:

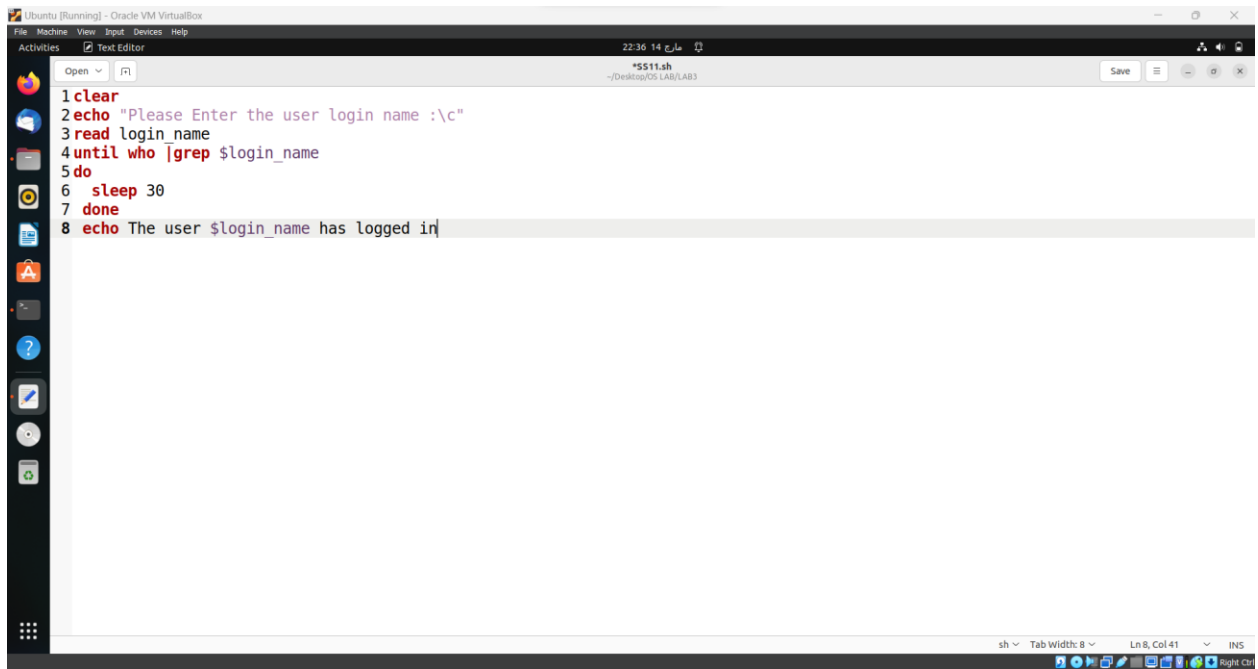
```
1 clear
2 echo What is the Capital of Saudi Arabia \?
3 read answer
4 while test $answer != Riyadh
5 do
6 echo No,Wrong please try again
7 read answer
8 done
9 echo This is correct|
```



This screenshot shows a terminal window titled 'muhammad@muhammad-VirtualBox: ~/.Desktop/OS LAB/LAB3'. The output of the script is as follows:

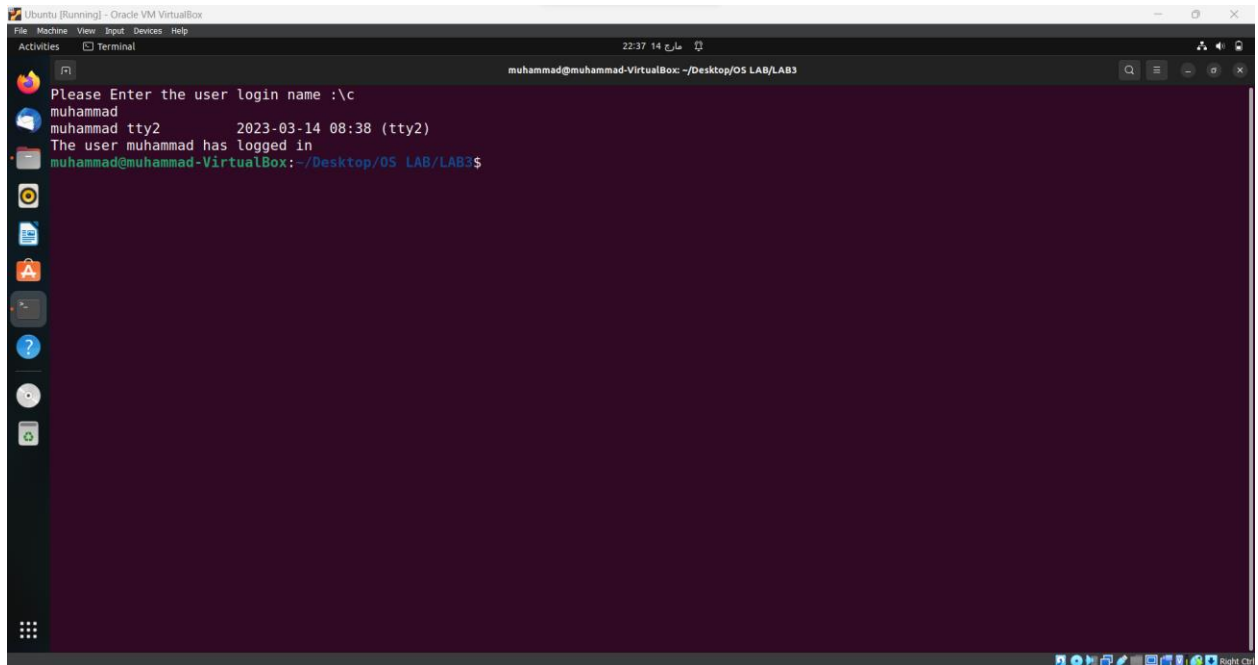
```
What is the Capital of Saudi Arabia ?
Riyadh
This is correct
muhammad@muhammad-VirtualBox:~/.Desktop/OS LAB/LAB3$
```

SS11



The screenshot shows a text editor window titled "Ubuntu [Running] - Oracle VM VirtualBox". The editor is displaying a shell script named "SS11.sh" located at "~/Desktop/OS LAB/LAB3". The script contains the following code:

```
1 clear
2 echo "Please Enter the user login name :\c"
3 read login_name
4 until who [grep $login_name
5 do
6     sleep 30
7 done
8 echo The user $login_name has logged in
```

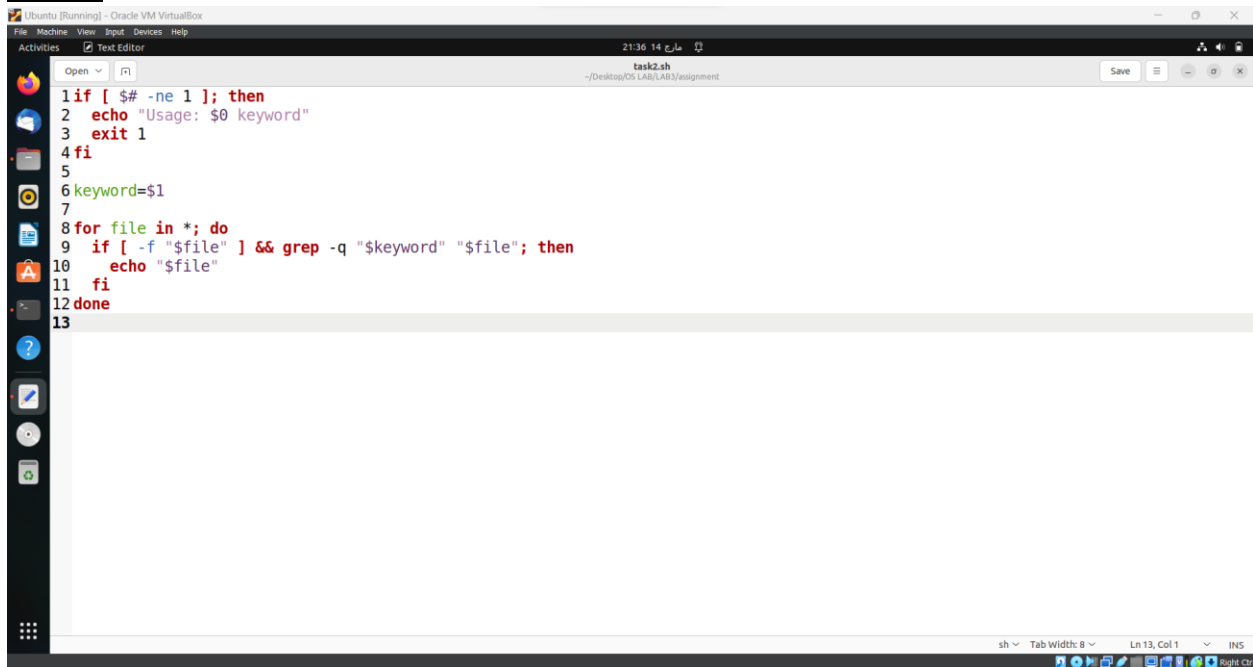


The screenshot shows a terminal window titled "Ubuntu [Running] - Oracle VM VirtualBox". The terminal is displaying the output of the shell script "SS11.sh" located at "~/Desktop/OS LAB/LAB3". The output is as follows:

```
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3
Please Enter the user login name :\c
muhammad
muhammad tty2      2023-03-14 08:38 (tty2)
The user muhammad has logged in
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3$
```

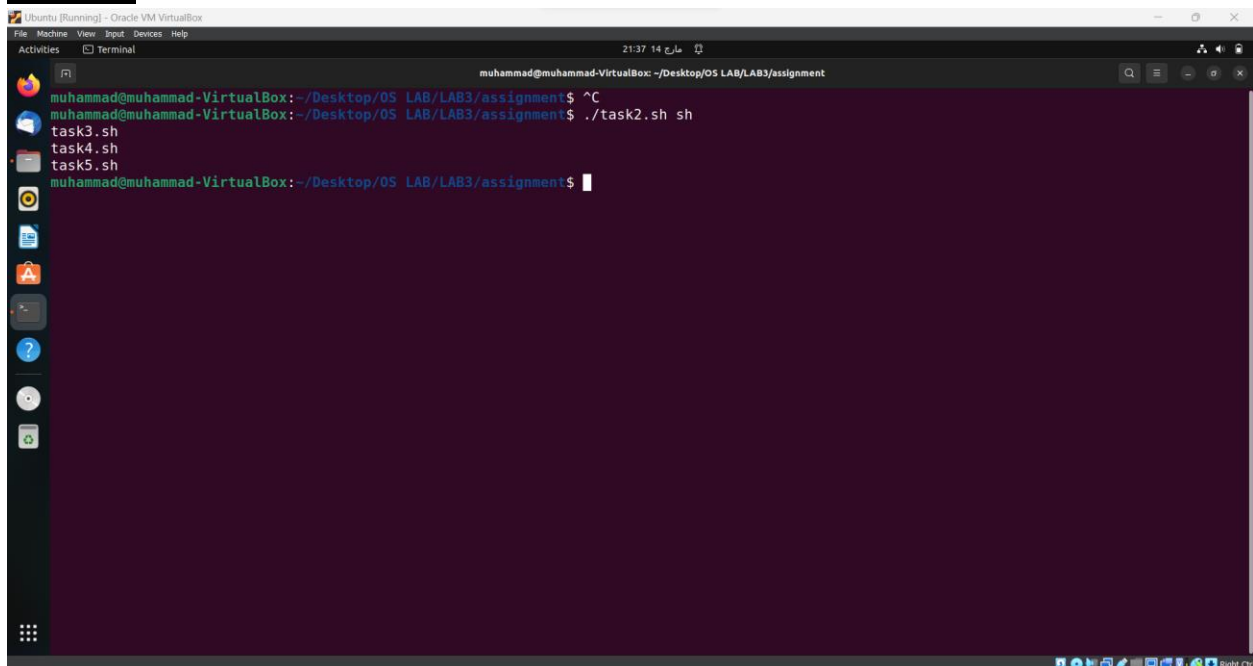
2. Write a shell script that takes a keyword as a command line argument and lists the filenames containing the keyword

Code:



```
1 if [ $# -ne 1 ]; then
2     echo "Usage: $0 keyword"
3     exit 1
4 fi
5
6 keyword=$1
7
8 for file in *; do
9     if [ -f "$file" ] && grep -q "$keyword" "$file"; then
10         echo "$file"
11     fi
12 done
13
```

Output:



```
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3/assignment
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3/assignment$ ^C
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3/assignment$ ./task2.sh sh
task3.sh
task4.sh
task5.sh
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3/assignment$
```

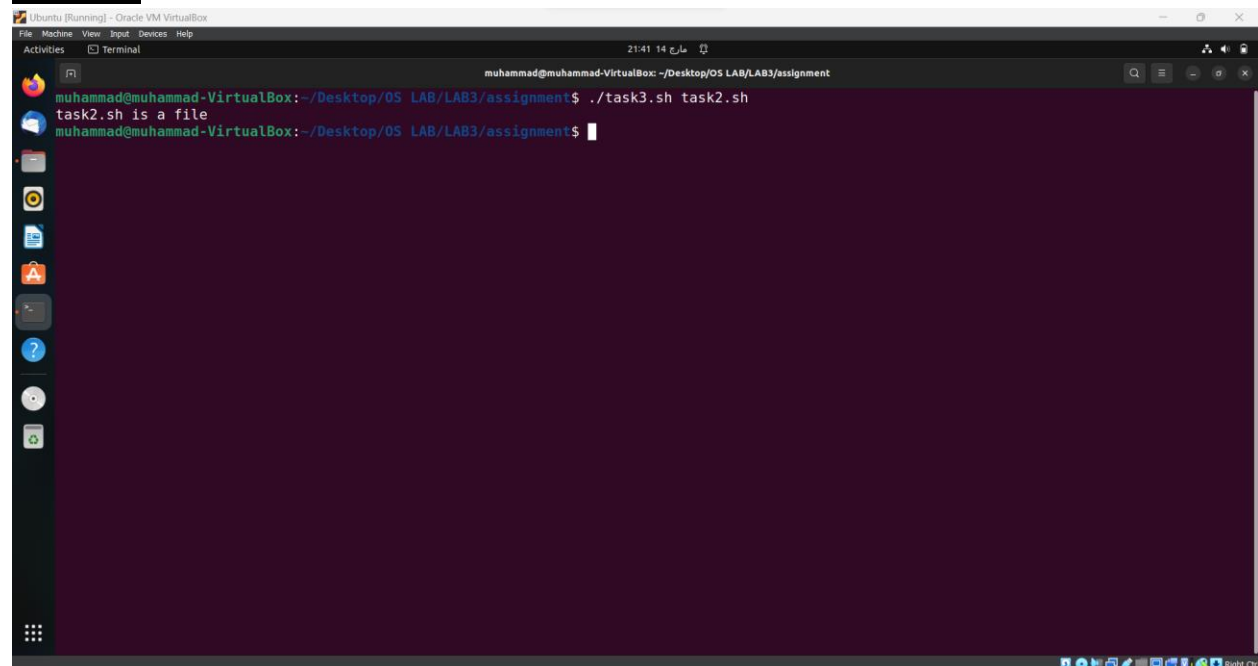
3. Write a shell script that takes a command line argument and reports whether it is a directory, or a file or a link.

Code:



```
1 if [ $# -ne 1 ]; then
2   echo "Usage: $0 file_or_directory_or_link"
3   exit 1
4 fi
5
6 path=$1
7
8 if [ -d "$path" ]; then
9   echo "$path is a directory"
10 elif [ -f "$path" ]; then
11   echo "$path is a file"
12 elif [ -L "$path" ]; then
13   echo "$path is a symbolic link"
14 else
15   echo "$path is not a valid file, directory, or link"
16   exit 1
17 fi
18
```

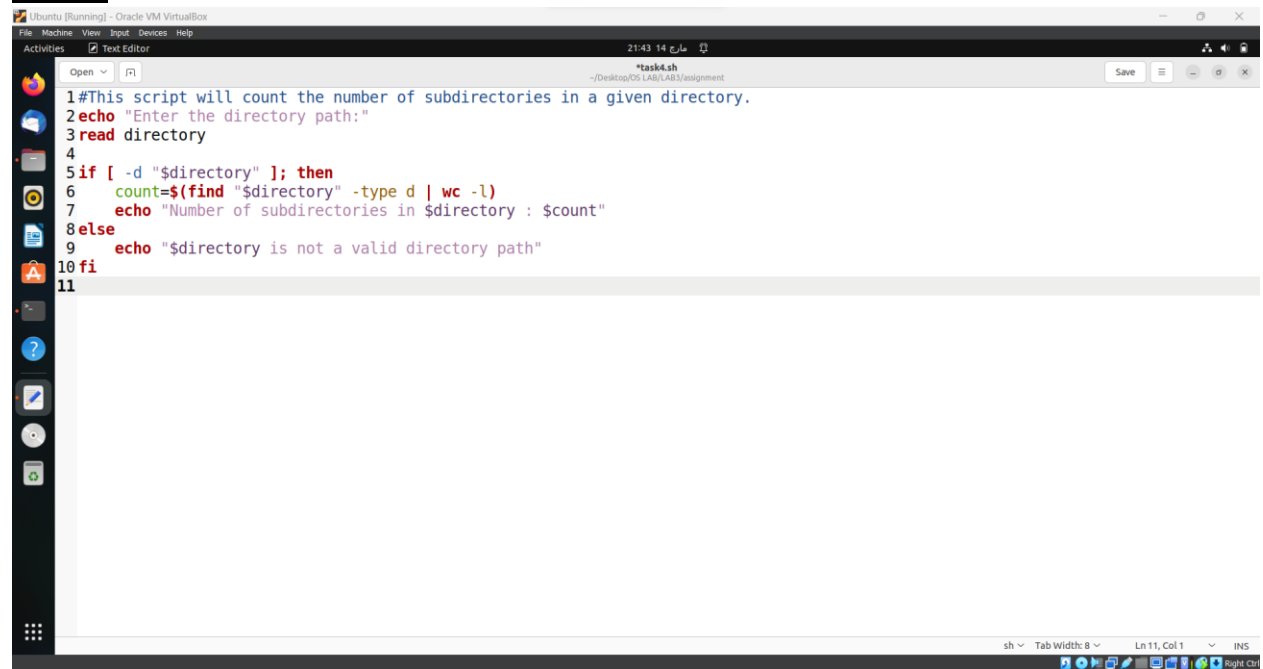
Output:



```
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3/assignment$ ./task3.sh task2.sh
task2.sh is a file
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB3/assignment$
```

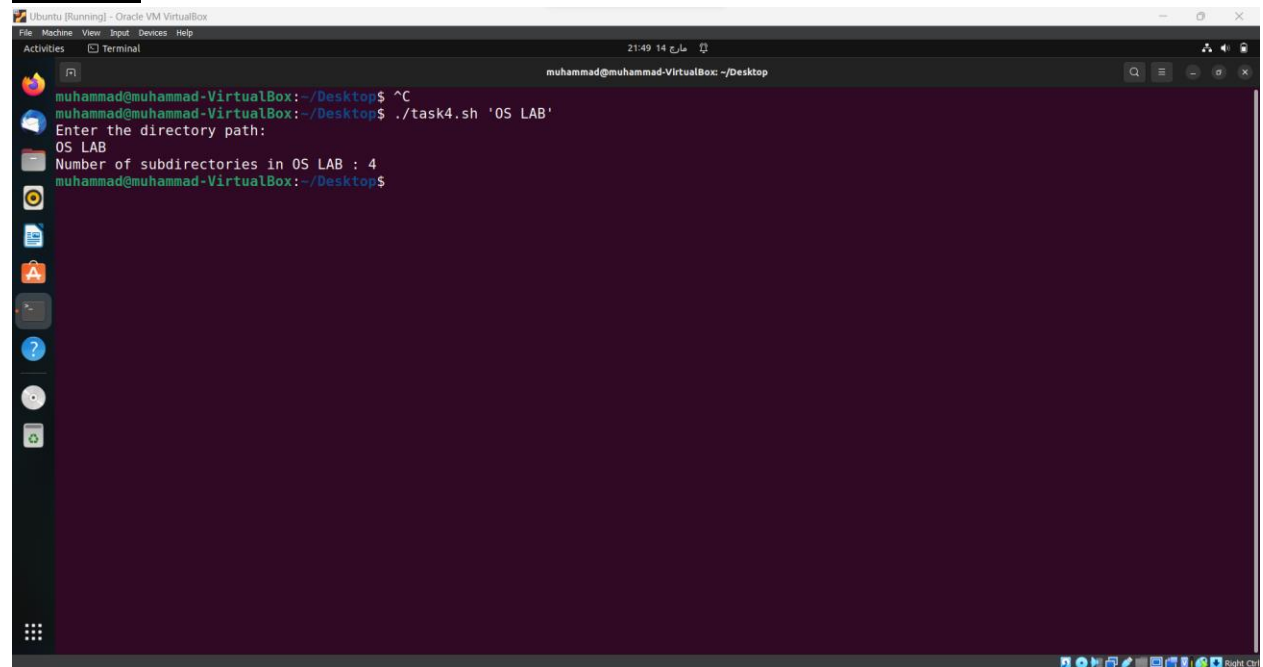
4. Write a script to find the number of sub directories in a given directory.

Code:



```
1#This script will count the number of subdirectories in a given directory.
2echo "Enter the directory path:"
3read directory
4
5if [ -d "$directory" ]; then
6    count=$(find "$directory" -type d | wc -l)
7    echo "Number of subdirectories in $directory : $count"
8else
9    echo "$directory is not a valid directory path"
10fi
11
```

Output:



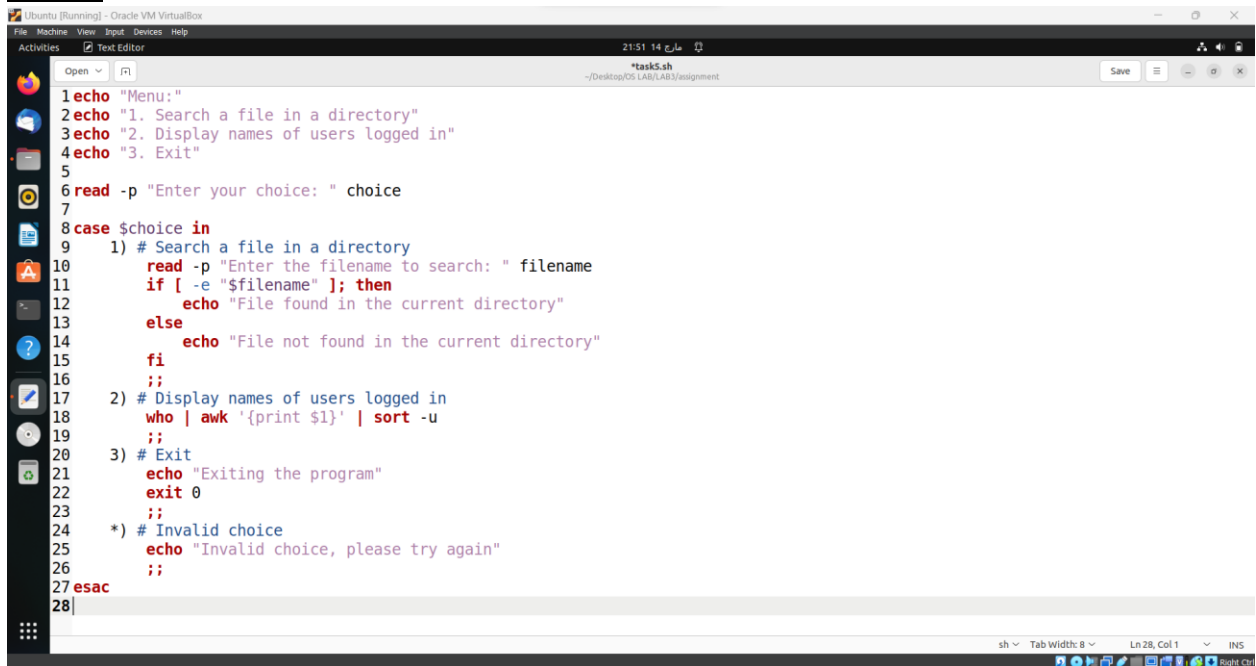
```
muhammad@muhammad-VirtualBox:~/Desktop$ ^C
muhammad@muhammad-VirtualBox:~/Desktop$ ./task4.sh 'OS LAB'
Enter the directory path:
OS LAB
Number of subdirectories in OS LAB : 4
muhammad@muhammad-VirtualBox:~/Desktop$
```

5. Write a menu driven program that has the following options.

5.1. Search a given file is in the directory or not.

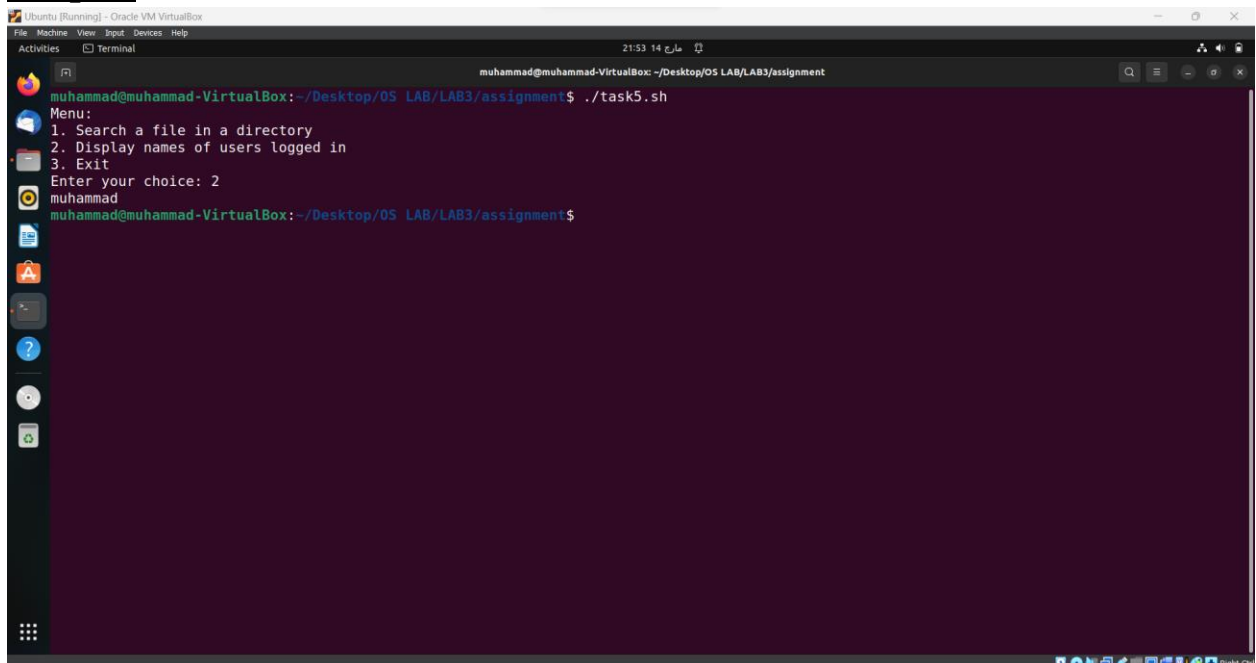
5.2. Display the names of the users logged in.

Code:

A screenshot of a text editor window titled "task5.sh" showing a shell script. The script uses a case statement to handle three menu options: searching for a file, displaying logged-in users, and exiting. It includes prompts for user input and feedback messages.

```
1 echo "Menu:"
2 echo "1. Search a file in a directory"
3 echo "2. Display names of users logged in"
4 echo "3. Exit"
5
6 read -p "Enter your choice: " choice
7
8 case $choice in
9     1) # Search a file in a directory
10        read -p "Enter the filename to search: " filename
11        if [ -e "$filename" ]; then
12            echo "File found in the current directory"
13        else
14            echo "File not found in the current directory"
15        fi
16        ;;
17     2) # Display names of users logged in
18        who | awk '{print $1}' | sort -u
19        ;;
20     3) # Exit
21        echo "Exiting the program"
22        exit 0
23        ;;
24     *) # Invalid choice
25        echo "Invalid choice, please try again"
26        ;;
27 esac
28|
```

Output:

A screenshot of a terminal window showing the execution of the script. The user enters '2' for the second menu option, and the terminal displays the output of the 'who' command, which lists the names of users logged in.

```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3/assignment$ ./task5.sh
Menu:
1. Search a file in a directory
2. Display names of users logged in
3. Exit
Enter your choice: 2
muhammad
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB3/assignment$
```