LAB10. SHELL SCRIPTS (II)- PROGRAMMING (SELECTION CONSTRUCTS)

Instructor :

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Objectives:

After completing this lab, the student should be able to:
- Include **programming selection constructs** in shell scripts.
- Use **the if/else** statement to manipulate **integer and string** values as well as file properties.
- Apply the **case statement** programming construct for efficient selections as well as **creating menus**

Unix commands return a value (success = zero and failure or error = non-zero) to the shell. This value is stored in the variable (?) as follows

CONT..

Run the command:
ls –al
Now run the command:
echo $?
What result did you get? ____________ ***Why?***
____________________________________.

Now run the command:
cp
followed by the command:
echo $?
What result did you get? ____________ ***Why?***
____________________________________.

EXAMPLE:

Write the following script (*checkcommand*):

```
#!/bin/bash
if $1
then
        echo command $1 succeed
    else
         echo command $1 failed
    fi
:wq
```

Re-Write the following

```
if $1  2>err >out
then
     echo Command $1 succeed
else
    echo Command $1 failed
fi
:wq
```

- checkcommand date
  What result did you get? __________ *Why?*______________________________.

- Now run the command:
  checkcommand mv

What result did you get? __________ *Why?* ______________________________.

CONT..

This is **one way** to use the if/else structure.

Still, many scripts do not check commands, but rather check for **variable values, file properties, and number of arguments**.

To do that we need to use one of two syntaxes:

if test condition (e.g. if test $# -eq 2)

or

if [condition] (e.g. if [$# -eq 2])

In Bash, we have the following conditional statements:

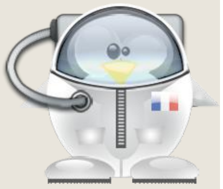
if..then..fi statement (Simple If)
if..then..else..fi statement (If-Else)
if..then ..elif..else..fi statement (Else If ladder)
if..then..else..if..then..fi..fi..(Nested if)

```
if [ conditional expression ]
then
        statement1
        statement2
        .....
fi
```

```
if [ conditional
expression ]
then    statement1
        statement2
else
        statement3
        statement4
fi
```

if..elif..else..fi statement (Else If ladder)

```
if [ conditional expression1 ]
then
        statement1
        statement2
elif [ conditional expression2 ]
    then
        statement3
        statement4
else
        statement5

fi
```



if..then..else..if..then..fi..fi..(Nested if)

```
if [ conditional expression1 ]
then
    statement1
    statement2
else
if [ conditional expression2 ]
    then
statement3
    fi
fi
```

CONT..

To compare integer values, we use the following relational operators:

-lt (less than),

-gt (greater than)

-eq (equal)
-le (less than or equal)

-ge (greater than or equal),

-ne (not equal).

INTEGER VALUES:

- *Write a script called sum, that accepts integer number and print the sum*
- *e.g*

X=5

Y=10

sum=15

expr $X + $Y
Or you can use
echo $(($X + $Y))

```
#! /bin/bash
echo "Enter two numbers"
read num1 num2
sum=$(expr $num1 + $num2)
#without spaces:print concat of two numbers 10+5
echo "The sum is = $sum"
```

```
#! /bin/bash
echo "Enter two numbers"
read num1 num2
sum=$(($num1+$num2))
echo "The sum is = $sum"
```

```
echo enter two numbers
read num1
read num2
sums=$(( num1+num2 ))
echo sum=$sums
```

```
echo sum=$(($1+$2))
```

Let us rewrite the delete script we wrote in the previous lab to check for the correct number of arguments as follows:

```
vi delete
if [ $# -eq 1 ]
then
    rm $1
   echo $1 has been deleted
exit 0   #This line return 0 from the script  (success)
else
    echo Usage: delete filename
    exit 1
  fi
:wq
```

CON..

- Now try the above script as follows:
- ***delete myfile*** (assuming myfile exists and is a regular file)
  Then run the command:
  echo $?
  Did it work?________________________.
  What is the value of variable (?) ?____________________________
- Now try it as follows:
  delete
  Then run the command:
  echo $?
  What happened? ______________________
- ***Why?***_________________________.
  What is the value of variable (?) ?____________________________

To check file values we use the following operators:
-f filename (to check if file exists and is of type file)
-d filename (to check if directory exists and is of type directory)
-x,-r,-w (to check if a user has execute, read, or write permissions on a file)

Now, Rewrite the delete script using -f and -d options?

Now create a file and a directory using the following commands:

touch   myfile; mkdir mydir

No try the updated delete script in the following ways:

delete

What happened? ____.

delete   myfile   (myfile exists and is a file)

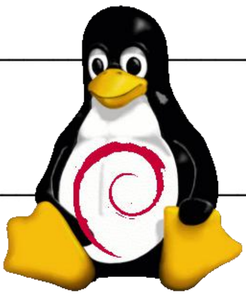
What happened?____.

delete   mydir   (mydir exists and is a directory)

What happened?____.

delete wrong   (wrong does not exist)

What happened?____.



QUESTION:

Now rewrite the copy script to act as follows:

```
copy
            Usage:  copy src  dest
copy  myfile   newfile
            File myfile is copied to file newfile
copy  mydir    newdir
            Directory  mydir  is copied to newdir
copy  wrong   good
            wrong:  No such file or directory
```

Sometimes our scripts need to check string values. To do that we need to use the following operators:

= (equal), != (not equal) ,-n (none null string) -z (zero string (null))

Let us try some of those. let us write a script to check the value of the name entered by the user:

vi checkname

```
if [ $# -ne 1 ]
then echo Usage: checkname name
     exit 1
  else
  if [ "$1" = "ahmad" ]
     then echo Hello $1
    exit 0
  else
        echo Goodbye $1
       exit 0
  fi
fi
```

Try it as follows:

checkname ahmad

What happened?________________.

checkname suha

What happened?________________.

checkname

What happened?________________.

QUESTION

Write a script called checkusername which works as follows:

```
checkusername
No names were entered

checkusername u1112233
u1160170 = Shadi Mohammad

checkusername u11
u11 = No such user name

checkusername bash
bash = No such user name
```

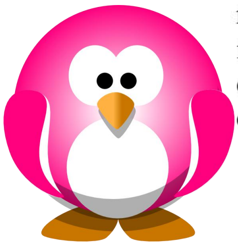
Case Statement

We can also use a case statement (similar to switch in c) to check for values. The syntax
is as follows:

```
case value in

  pattern1) statements
              ;;    # ;; is the break statement

  pattern2) statements

              ;;

  *) statements     # * stand for default case

esac
```

The patterns may be strings or parts of strings. Those can include the * wild card, the (|) OR operator, as well as ranges (e.g [0-9] or [a-f]) as follows:

s* | S* | good)
    means any pattern that starts with s or S or the word good.
[A-Z]*[0-5])
    means any pattern with any size that starts with a capital letter and ends with a number between 0 and 5
[a-z][0-9][0-9][0-9] | [0-9][A-Z][A-Z][A-Z][a-f])
    means the accepted pattern must consist of exactly four characters the first is a small letter and the next three are numbers or the pattern must be exactly five characters with the first being a number followed by three capital letters and then one small letter between a and f.



Case statements are usually used for handling menus and menu options. Let us try a simple example that uses a menu to call different scripts (modular programming):

Create three different scripts called ***script1***, ***script2***, and ***script3*** respectively. In each script put one line to display which script you're in (e.g in script1 put the line "echo this is script 1").
Now create a script called ***mainscript*** that displays the following menu:

Please select your choice (1-4):
1 - Run script1
2- Run script2
3- Run script3
4- Exit main script

```
#! /bin/bash
echo "Please Select your choice (1-4):
1-Run script1
2-Run Script2
3-Run Script3
4-Exit main script"
read choice
case $choice in
  1) ./script1
  ;;
  2) ./script2
  ;;
  3) ./script3
  ;;
  4) exit
esac
```

```
echo hi from script 1
```

```
echo hi from script 2
```

```
echo hi from script 3
```