

# BASH SCRIPTING

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Div:1

## 1. Script execution

```
Student user can run following commands with sudo: systemctl apt dpkg docker mount
student@administrator-foss26:~$ echo 'echo HAPPY NEW YEAR!>happy.sh
student@administrator-foss26:~$ cat happy.sh
echo HAPPY NEW YEAR!
student@administrator-foss26:~$ bash happy.sh
HAPPY NEW YEAR!
student@administrator-foss26:~$ cat<<ALLDONE>happy_multiline.sh
> echo HAPPY NEW YEAR
> ECHO I HOPE YOU ENJOY THIS YEAR
> ALLDONE
student@administrator-foss26:~$ bash happy_multiline.sh
HAPPY NEW YEAR
happy_multiline.sh: line 2: ECHO: command not found
student@administrator-foss26:~$ ^C
student@administrator-foss26:~$ cat<<ALLDONE>happy_multiline.sh
> echo HAPPY NEW YEAR
> echo I HOPE YOU ENJOY THIS YEAR
> ALLDONE
student@administrator-foss26:~$ bash happy_multiline.sh
HAPPY NEW YEAR
I HOPE YOU ENJOY THIS YEAR
student@administrator-foss26:~$ bash -x-v happy.sh
bash: --: invalid option
Usage: bash [GNU long option] [option] ...
        bash [GNU long option] [option] script-file ...
GNU long options:
    --debug
    --debugger
    --dump-po-strings
    --dump-strings
    --help
    --init-file
    --login
    --noediting
    --noprofile
    --norc
    --posix
    --pretty-print
```

## 2. Special Parameters:

```
--debugger
--dump-po-strings
--dump-strings
--help
--init-file
--login
--noediting
--noprofile
--norc
--posix
--pretty-print
--rcfile
--restricted
--verbose
--version
Shell options:
  -ilrsD or -c command or -O shopt_option      (invocation only)
  -abefhkmnptuvxBCHP or -o option
student@administrator-foss26:~$ #!/bin/bash
student@administrator-foss26:~$ touch hello.sh
student@administrator-foss26:~$ nano hello.sh
student@administrator-foss26:~$ chmod +x hello.sh
student@administrator-foss26:~$ ./hello.sh
HELLO WORLD
student@administrator-foss26:~$ touch sum.sh
student@administrator-foss26:~$ cat sum.sh
student@administrator-foss26:~$ #!/bin/bash
student@administrator-foss26:~$ rm sum.sh
student@administrator-foss26:~$ vi alpha.sh
student@administrator-foss26:~$ bash alpha.sh
student@administrator-foss26:~$ vi alpha.sh
student@administrator-foss26:~$ bash alpha.sh {A..Z}
C D
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
26
```

### Input commands

```
#!/bin/bash
echo ${3} ${4}
echo $*
echo $@
echo $#
echo $-
echo $$
echo $!
echo $0
```

```
~
~
```

## Output

```
student@administrator-foss26:~$ vi alpha.sh
student@administrator-foss26:~$ bash alpha.sh {A..X}
C D
A B C D E F G H I J K L M N O P Q R S T U V W X
A B C D E F G H I J K L M N O P Q R S T U V W X
24
hB
4800

alpha.sh
```

### 3. Shell Expansion – arithmetic:

```
#!/bin/bash
a=3
b=4
echo $((a=a+b))
echo $a

((a++))
echo $a

unset b
((b--))
echo $b
~
~
~
~
~

student@administrator-foss26:~$ vi sum.sh
student@administrator-foss26:~$ bash sum.sh
7
7
student@administrator-foss26:~$ vi sum.sh
student@administrator-foss26:~$ bash sum.sh
7
7
8
-1
```

#### 4. Variables:

```
predator@LAPTOP-SAVF3Q7P:~/bash$ a=4
predator@LAPTOP-SAVF3Q7P:~/bash$ b=23
predator@LAPTOP-SAVF3Q7P:~/bash$ echo $a
4
predator@LAPTOP-SAVF3Q7P:~/bash$ echo $b
23
predator@LAPTOP-SAVF3Q7P:~/bash$ echo $[a+b]
27
predator@LAPTOP-SAVF3Q7P:~/bash$
```

#### 5. Array:

```
#!/bin/bash
array={a,b,c}
for chr in ${array[@]}
do echo $chr
done
```

```

predator@LAPTOP-SAVF3Q7P:~$ b=34
predator@LAPTOP-SAVF3Q7P:~$ echo $a
23
predator@LAPTOP-SAVF3Q7P:~$ echo [$a+$b]
57
predator@LAPTOP-SAVF3Q7P:~$ array={a,b,c}
predator@LAPTOP-SAVF3Q7P:~$ echo ${array[*]}
{a,b,c}
predator@LAPTOP-SAVF3Q7P:~$ echo ${#array[*]}
1
predator@LAPTOP-SAVF3Q7P:~$ nano array.sh
Use "fg" to return to nano.

[1]+  Stopped                  nano array.sh
predator@LAPTOP-SAVF3Q7P:~$ bash array.sh
bash: array.sh: No such file or directory
predator@LAPTOP-SAVF3Q7P:~$ vi array.sh
predator@LAPTOP-SAVF3Q7P:~$ function status {date; uptime; who | grep $USER;}
-bash: syntax error near unexpected token `{date'
predator@LAPTOP-SAVF3Q7P:~$ status

```

## 6. Function:

```

predator@LAPTOP-SAVF3Q7P:~$ a=23
predator@LAPTOP-SAVF3Q7P:~$ b=34
predator@LAPTOP-SAVF3Q7P:~$ [$a -lt $b]
[23: command not found
predator@LAPTOP-SAVF3Q7P:~$ [ $a -lt $b ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
0
predator@LAPTOP-SAVF3Q7P:~$ [ $a -gt $b ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
1
predator@LAPTOP-SAVF3Q7P:~$ [ $a -ne $b ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
0
predator@LAPTOP-SAVF3Q7P:~$ _

```

```

predator@LAPTOP-SAVF3Q7P:~$ [ "mango" = "orange"]
-bash: [: missing `]'
predator@LAPTOP-SAVF3Q7P:~$ [ "mango" = "orange" ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
1
predator@LAPTOP-SAVF3Q7P:~$ str="mango"
predator@LAPTOP-SAVF3Q7P:~$ str="orange"
predator@LAPTOP-SAVF3Q7P:~$ [ $str1 = $str2 ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
0
predator@LAPTOP-SAVF3Q7P:~$ str1="mamgo"
predator@LAPTOP-SAVF3Q7P:~$ str2="orange"
predator@LAPTOP-SAVF3Q7P:~$ [ $str1 = $str2 ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
1

```

## 7. String Comparisons:

```

predator@LAPTOP-SAVF3Q7P:~$ [ "mango" = "orange"]
-bash: [: missing `]'
predator@LAPTOP-SAVF3Q7P:~$ [ "mango" = "orange" ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
1
predator@LAPTOP-SAVF3Q7P:~$ str="mango"
predator@LAPTOP-SAVF3Q7P:~$ str="orange"
predator@LAPTOP-SAVF3Q7P:~$ [ $str1 = $str2 ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
0
predator@LAPTOP-SAVF3Q7P:~$ str1="mamgo"
predator@LAPTOP-SAVF3Q7P:~$ str2="orange"
predator@LAPTOP-SAVF3Q7P:~$ [ $str1 = $str2 ]
predator@LAPTOP-SAVF3Q7P:~$ echo $?
1

```

## 8. If..elif..else..fi:

```

predator@LAPTOP-SAVF3Q7P:~$ a=23
predator@LAPTOP-SAVF3Q7P:~$ if ((a==23)); then echo yes; else echo no; fi
yes
predator@LAPTOP-SAVF3Q7P:~$ if (( (a-23)==0)); then echo yes; else echo no; fi
yes
predator@LAPTOP-SAVF3Q7P:~$ if ((a<10)); then echo yes; else echo no; fi
no
predator@LAPTOP-SAVF3Q7P:~$ if ((a>24)); then echo yes; else echo no; fi
predator@LAPTOP-SAVF3Q7P:~$ if ((a>24)); then echo yes; else echo no; fi
no

```



## 9. Bash Arithmetic:

### 1. Expr command:

```
predator@LAPTOP-SAVF3Q7P:~$ expr 2 + 33
35
predator@LAPTOP-SAVF3Q7P:~$ expr 36 \ / 6
6
predator@LAPTOP-SAVF3Q7P:~$ expr 36 | * 6
D1: command not found
predator@LAPTOP-SAVF3Q7P:~$ expr 36 \ * 6
216
predator@LAPTOP-SAVF3Q7P:~$ expr 200 - 3 \ * 6
182
predator@LAPTOP-SAVF3Q7P:~$ expr 234 + 34 \ / 17 * 2
expr: syntax error
predator@LAPTOP-SAVF3Q7P:~$ expr 234 + 34 / 17 \ * 2
238
```

### 2. Let command:

```
predator@LAPTOP-SAVF3Q7P:~$ let a=2+22
predator@LAPTOP-SAVF3Q7P:~$ echo $a
24
predator@LAPTOP-SAVF3Q7P:~$ let b=4*($a-1)
predator@LAPTOP-SAVF3Q7P:~$ echo

predator@LAPTOP-SAVF3Q7P:~$ echo $b
92
predator@LAPTOP-SAVF3Q7P:~$ let c=($b*3)/2
predator@LAPTOP-SAVF3Q7P:~$ echo $c
389344
predator@LAPTOP-SAVF3Q7P:~$ let c++
predator@LAPTOP-SAVF3Q7P:~$ echo $c
389345
predator@LAPTOP-SAVF3Q7P:~$ echo $(c--)
c--: command not found

predator@LAPTOP-SAVF3Q7P:~$ echo $(c-)
c-: command not found

predator@LAPTOP-SAVF3Q7P:~$ let c-
-bash: let: c-: syntax error: operand expected (error token is "-")
```

### 3. bc command:

```
predator@LAPTOP-SAVF3Q7P:~$ echo '8.6/2.2'|bc
3
predator@LAPTOP-SAVF3Q7P:~$ echo '8.6/2.1'|bc
4
predator@LAPTOP-SAVF3Q7P:~$ echo 'scale=2;8.6/2.1'|bc
4.09
predator@LAPTOP-SAVF3Q7P:~$ squareroot=$(echo 'scale=10;sqrt(45)'|bc)
predator@LAPTOP-SAVF3Q7P:~$ echo $squareroot
6.7082039324
predator@LAPTOP-SAVF3Q7P:~$ bc
bc 1.07.1
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For details type `warranty'.
237-34
203
34*10
340
230/10
23
245+456
701
rate=23.33
rate*100
2333.00
11^3
1331
scale=2
197/2
98.50
```