

Assignment Bash Script

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S4

Script Execution by calling bash

```
this message is shown once a day. To disable it please create the
/home/shreya/.hushlogin file.
shreya@LAPTOP-709J572C:~$ mkdir bash_script
shreya@LAPTOP-709J572C:~$ cd bash_script
shreya@LAPTOP-709J572C:~/bash_script$ touch hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ nano hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ chmod +x hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ ./hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ nano hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ nano hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ chmod +x hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ ./hello-world.sh
Hello World
shreya@LAPTOP-709J572C:~/bash_script$ bash -x -v hello-world.sh
#!/bin/bash
#This is my hello world bash script
echo "Hello World"
+ echo 'Hello World'
Hello World
shreya@LAPTOP-709J572C:~/bash_script$ cat x.sh
Command 'car' not found, but can be installed with:
sudo apt install ucommon-utils
shreya@LAPTOP-709J572C:~/bash_script$ cat x.sh
cat: x.sh: No such file or directory
shreya@LAPTOP-709J572C:~/bash_script$ rm
rm: missing operand
Try 'rm --help' for more information.
shreya@LAPTOP-709J572C:~/bash_script$ ls
hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ ls -F
hello-world.sh*
shreya@LAPTOP-709J572C:~/bash_script$ ls -l
total 4
-rwxr-xr-x 1 shreya shreya 67 Jan 22 11:24 hello-world.sh
shreya@LAPTOP-709J572C:~/bash_script$ echo 'echo Hello World!' >hello_world.sh
shreya@LAPTOP-709J572C:~/bash_script$ cat hello-world.sh
#!/bin/bash
#This is my hello world bash script
echo "Hello World"
shreya@LAPTOP-709J572C:~/bash_script$ bash hello_world.sh
Hello World!
shreya@LAPTOP-709J572C:~/bash_script$
```

Multiline File Creation

```
shreya@LAPTOP-709J572C:~/bash_script$ cat <<ALLDONE> hello_world_multiline.sh
> echo Hello World!
> echo Yet another line
> echo This is getting boring
> ALLDONE
shreya@LAPTOP-709J572C:~/bash_script$ bash hello_world_multiline.sh
Hello World!
Yet another line
This is getting boring
shreya@LAPTOP-709J572C:~/bash_script$
```

```
shreya@LAPTOP-709J572C:~/bash_script$ nano hello_world.sh
shreya@LAPTOP-709J572C:~/bash_script$ chmod +x hello_world.sh
shreya@LAPTOP-709J572C:~/bash_script$ ./hello_world.sh
This is the new file in which nano is being executed
It is related to bash script
shreya@LAPTOP-709J572C:~/bash_script$ nano hello_world.sh
shreya@LAPTOP-709J572C:~/bash_script$
```

Script Execution with #! - Shebang

Nano

```
shreya@LAPTOP-709J572C: ~/bash_script
GNU nano 6.2 hello_world.sh
#!/bin/bash
echo This is the new file in which nano is being executed
echo It is related to bash script
```

Special Parameters

```

shreya@LAPTOP-709J572C:~/bash_script$ touch x.sh
shreya@LAPTOP-709J572C:~/bash_script$ nano x.sh
shreya@LAPTOP-709J572C:~/bash_script$ bash x.sh {A...Z}
{A...Z}
shreya@LAPTOP-709J572C:~/bash_script$ touch xp.sh
shreya@LAPTOP-709J572C:~/bash_script$ nano xp.sh
shreya@LAPTOP-709J572C:~/bash_script$ bash xp.sh {A...Z}

{A...Z} Represents all args as single string

{A...Z} All args are represented as an array

1 is total number of args

hB current option flag

82 is the PID of the shell

xp.sh is the script name

echo final arg of last executed Foreground command

shreya@LAPTOP-709J572C:~/bash_script$

```

Shell Expansion:1. Brace Expansion

```

shreya@LAPTOP-709J572C:~/bash_script$ echo a{b,b,c}e
abe abe ace
shreya@LAPTOP-709J572C:~/bash_script$ echo {A...Z}
{A...Z}
shreya@LAPTOP-709J572C:~/bash_script$ echo {A..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
shreya@LAPTOP-709J572C:~/bash_script$ cd
shreya@LAPTOP-709J572C:~$ mkdir z{1..10}
shreya@LAPTOP-709J572C:~$ ls
Downloads  Q2.c  a.out          downloads  sum.tar  z10  z3  z5  z7  z9

```

2. Parameter Expansion – Arithmetic Expansion

```
shreya@LAPTOP-709J572C:~$ a=4
shreya@LAPTOP-709J572C:~$ b=8
shreya@LAPTOP-709J572C:~$ echo $((a=a+b))
12
shreya@LAPTOP-709J572C:~$ echo $a
12
shreya@LAPTOP-709J572C:~$ ((a++))
shreya@LAPTOP-709J572C:~$ echo $a
13
shreya@LAPTOP-709J572C:~$ b=8
shreya@LAPTOP-709J572C:~$ unset b
shreya@LAPTOP-709J572C:~$ ((b--))
shreya@LAPTOP-709J572C:~$ echo $b
-1
shreya@LAPTOP-709J572C:~$ a=1
shreya@LAPTOP-709J572C:~$ let a++
shreya@LAPTOP-709J572C:~$ echo $a
2
shreya@LAPTOP-709J572C:~$
```

3. Command Substitution

```
shreya@LAPTOP-709J572C:~$ echo `uname -n`
uname -n
shreya@LAPTOP-709J572C:~$ echo `uname -n`
LAPTOP-709J572C
shreya@LAPTOP-709J572C:~$ echo $(uname -n)
LAPTOP-709J572C
shreya@LAPTOP-709J572C:~$
```

Variables

```
shreya@LAPTOP-709J572C:~$ nano variables.sh
shreya@LAPTOP-709J572C:~$ bash variables.sh
Welcome back shreya! Today is Sunday, ehich is the best day of the week!
YOur Bash shell version is : 5.1.16(1)-release. Enjoy!
shreya@LAPTOP-709J572C:~$ a=4
shreya@LAPTOP-709J572C:~$ b=8
shreya@LAPTOP-709J572C:~$ echo $a
4
shreya@LAPTOP-709J572C:~$ echo $b
8
shreya@LAPTOP-709J572C:~$ echo ${a+$b}
12
shreya@LAPTOP-709J572C:~$
```

Arrays

```
shreya@LAPTOP-709J572C:~$ array=(a b c)
shreya@LAPTOP-709J572C:~$ echo ${array[*]}
a b c
shreya@LAPTOP-709J572C:~$ echo ${array[2]}
c
shreya@LAPTOP-709J572C:~$ echo ${#array[*]}
> done
> ^C
shreya@LAPTOP-709J572C:~$ echo ${#array[*]}
3
shreya@LAPTOP-709J572C:~$ for chr in ${array[@]}; do
> echo $chr
> done
a
b
c
shreya@LAPTOP-709J572C:~$
```

Input, Output and Error Redirections

```
shreya@LAPTOP-709J572C:~$ touch foobar
shreya@LAPTOP-709J572C:~$ ls -l foobar
-rw-r--r-- 1 shreya shreya 0 Jan 22 12:28 foobar
shreya@LAPTOP-709J572C:~$ echo $?
0
shreya@LAPTOP-709J572C:~$ ls -l foobar
-rw-r--r-- 1 shreya shreya 0 Jan 22 12:28 foobar
shreya@LAPTOP-709J572C:~$ echo $?
0
shreya@LAPTOP-709J572C:~$ #exit status(if 0--> success else fail)
shreya@LAPTOP-709J572C:~$
```

Redirecting stdout and stderr

```

shreya@LAPTOP-709J572C:~$ ls foobar barfoo
ls: cannot access 'barfoo': No such file or directory
foobar
shreya@LAPTOP-709J572C:~$ ls foobar barfoo > stdout.txt
ls: cannot access 'barfoo': No such file or directory
shreya@LAPTOP-709J572C:~$ ls foobar barfoo 2 > stderr.txt
ls: cannot access 'barfoo': No such file or directory
ls: cannot access '2': No such file or directory
shreya@LAPTOP-709J572C:~$ ls foobar barfoo &>stdoutandstderr.txt
shreya@LAPTOP-709J572C:~$ cat stdout.txt
foobar
shreya@LAPTOP-709J572C:~$ cat stdoutandstderr.txt
cat: stdoutandstderr.txt: No such file or directory
shreya@LAPTOP-709J572C:~$ █

```

Redirecting stdin

```

shreya@LAPTOP-709J572C:~$ cat>file1.txt
I am using keyboard to input text.
Cat command reads my keyboard input, converts it to stdout which is instantly redirected to file1.txt
This is, until I press CTRL+D
shreya@LAPTOP-709J572C:~$ cat<file1.txt
I am using keyboard to input text.
Cat command reads my keyboard input, converts it to stdout which is instantly redirected to file1.txt
This is, until I press CTRL+D

```

Numeric Comparison

```

shreya@LAPTOP-709J572C:~$ a=1
shreya@LAPTOP-709J572C:~$ b=2
shreya@LAPTOP-709J572C:~$ [ $a -lt $b ]
[1: command not found
shreya@LAPTOP-709J572C:~$ [ $a -lt $b ]
-bash: [: missing `]'
shreya@LAPTOP-709J572C:~$ [ $a -lt $b ]
shreya@LAPTOP-709J572C:~$ echo $?
0
shreya@LAPTOP-709J572C:~$ [ $a -gt $b ]
shreya@LAPTOP-709J572C:~$ echo $?
1
shreya@LAPTOP-709J572C:~$ [ $a -ne $b ]
shreya@LAPTOP-709J572C:~$ echo $?
0
shreya@LAPTOP-709J572C:~$ [ $a -eq $b ]
-bash: [: missing `]'
shreya@LAPTOP-709J572C:~$ echo $?
2
shreya@LAPTOP-709J572C:~$ [ $a -eq $b ]
shreya@LAPTOP-709J572C:~$ echo $?
1
shreya@LAPTOP-709J572C:~$

```


Comparing Strings

```
shreya@LAPTOP-709J572C:~$ [ "apples" = "oranges" ]
shreya@LAPTOP-709J572C:~$ echo $?
1
shreya@LAPTOP-709J572C:~$ atr1="apples"
shreya@LAPTOP-709J572C:~$ str2="oranges"
shreya@LAPTOP-709J572C:~$ [ str1 =str2 ]
-bash: [: str1: unary operator expected
shreya@LAPTOP-709J572C:~$ echo $?
2
shreya@LAPTOP-709J572C:~$ [ atr1 = str2 ]
shreya@LAPTOP-709J572C:~$ echo $?
1
shreya@LAPTOP-709J572C:~$ _
```

Conditional Arithmetic

```
shreya@LAPTOP-709J572C:~$ a=4
shreya@LAPTOP-709J572C:~$ if (( (a-5) == 0)) ;
> C
> ^C
shreya@LAPTOP-709J572C:~$ if (( (a-5) == 0)) ; then echo yes ;else echo no ; fi
no
shreya@LAPTOP-709J572C:~$ if (( a<10 )); then echo yes; else echo no; fi
yes
shreya@LAPTOP-709J572C:~$
```

Bash Arithmetics:

1. Arithmetic Expansion

```

shreya@LAPTOP-709J572C:~$ a=$((12 +5))
shreya@LAPTOP-709J572C:~$ echo $a
17
shreya@LAPTOP-709J572C:~$ echo $(( 12 + 5 ))
17
shreya@LAPTOP-709J572C:~$ echo $(( 100 - 1 ))
99
shreya@LAPTOP-709J572C:~$ echo $(( 3*11 ))
33
shreya@LAPTOP-709J572C:~$ division=$((100/10))
division: command not found
shreya@LAPTOP-709J572C:~$ division=$((100/10))
shreya@LAPTOP-709J572C:~$ echo $division
10
shreya@LAPTOP-709J572C:~$ x=10;y=33
shreya@LAPTOP-709J572C:~$ z=$(( $x * $y ))
shreya@LAPTOP-709J572C:~$ echo $z
330
shreya@LAPTOP-709J572C:~$

```

2. expr Command

```

shreya@LAPTOP-709J572C:~$ expr 2 + 2
4
shreya@LAPTOP-709J572C:~$ expr 6\*6
6*6
shreya@LAPTOP-709J572C:~$ expr 6 \* 6
36
shreya@LAPTOP-709J572C:~$ expr 6 / 3
2
shreya@LAPTOP-709J572C:~$ expr 1000 - 999
1
shreya@LAPTOP-709J572C:~$

```

3. let Command

```

shreya@LAPTOP-709J572C:~$ let a=2+2
shreya@LAPTOP-709J572C:~$ echo $a
4
shreya@LAPTOP-709J572C:~$ let b=4*($a-1)
shreya@LAPTOP-709J572C:~$ echo $b
12
shreya@LAPTOP-709J572C:~$ let c=($b**3)/2
shreya@LAPTOP-709J572C:~$ echo $c
864
shreya@LAPTOP-709J572C:~$ lete c++
Command 'lete' not found, did you mean:
  command 'late' from deb late (0.1.0-14)
  command 'leye' from deb ruby-eye (0.7-5)
Try: sudo apt install <deb name>
shreya@LAPTOP-709J572C:~$ let c++
shreya@LAPTOP-709J572C:~$ echo $c
865
shreya@LAPTOP-709J572C:~$ let c__
shreya@LAPTOP-709J572C:~$ echo $c
865
shreya@LAPTOP-709J572C:~$ let c--
shreya@LAPTOP-709J572C:~$ echo $c
864
shreya@LAPTOP-709J572C:~$

```

4. bc Command

```

shreya@LAPTOP-709J572C:~$ echo '8.5 / 2.3' | bc
3
shreya@LAPTOP-709J572C:~$ echo 'scale=2;8.5 / 2.3' | bc
3.69
shreya@LAPTOP-709J572C:~$ echo 'scale=30;8.5 / 2.3' | bc
3.695652173913043478260869565217
shreya@LAPTOP-709J572C:~$ squareroot=$( echo 'scale=50;sqrt(50)' | bc
> ^C
shreya@LAPTOP-709J572C:~$ squareroot=$( echo 'scale=50;sqrtr(50)' | bc)
Runtime error (func=(main), adr=13): Function sqrtr not defined.
shreya@LAPTOP-709J572C:~$ squareroot=$( echo 'scale=50;sqrt(50)' | bc)
shreya@LAPTOP-709J572C:~$ echo $squareroot
7.07106781186547524400844362104849039284835937688474
shreya@LAPTOP-709J572C:~$

```