

# ASSIGNMENT 2

## Script Execution

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo 'echo Hello World!' > helloworld.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ cat helloworld.sh
echo Hello World!
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bash helloworld.sh
Hello World!
```

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ touch hello.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ nano hello.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ chmod +x hello.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ ./hello.sh
Hello World
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bash -xv hello.sh
echo Hello World
+ echo Hello World
Hello World
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bash -x -v hello.sh
echo Hello World
+ echo Hello World
Hello World
```

## Special parameters

```
GNU nano 4.8
#!/home/spandan/Desktop/dtl-assignments
echo $*
echo $@
echo $#
echo $-
echo $$
echo $!
echo $!
echo $0
echo $_
echo $?
```

```

spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ nano hello.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bash hello.sh {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
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
hB
36825

hello.sh
hello.sh
0

```

## Arithmetic Operations & Command Substitution & File Name

```

spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $((12-3))
9
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ a=7
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ b=3
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $((a=a*b))
21
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $(uname -n)
spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx

```

## Variables

```

GNU nano 4.8
#!/bin/bash

greeting="Hello"
user=$(whoami)
day=$(date +%A)

echo "$greeting $user! Today is $day."
echo "Your shell is $BASH_VERSION."

```

```

spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ nano hello.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bash hello.sh
Hello spandan! Today is Monday.
Your shell is 5.0.17(1)-release.

```



```
GNU nano 4.8
#!/bin/bash

arr={a,b,c}
for chr in ${arr[*]};do
echo $chr
done
```

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ arr={a,b,c}
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo ${arr[*]}
arr[*]: command not found

spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo ${arr[*]}
{a,b,c}
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo ${arr[2]}

spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo ${#arr[*]}
1
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ nano hello.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bash hello.sh
{a,b,c}
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ nano hello.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bash hello.sh
{a,b,c}
```

## Functions

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ function stat { date; uptime; who | grep $USER; }
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ stat
Monday 06 February 2023 07:54:27 PM IST
19:54:27 up 4:33, 1 user, load average: 0.31, 0.19, 0.11
spandan :0 2023-02-06 15:21 (:0)
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ function self_fun() { echo "Hello I'm Spandan"; echo "This is a statement."; }
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ self_fun
Hello I'm Spandan
This is a statement.
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ unset self_fun
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ self_fun
self_fun: command not found
```

# Input & Output Error Redirection

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ touch foobar
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $?
0
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ ls -l foobar
-rw-rw-r-- 1 spandan spandan 0 Feb  6 20:11 foobar
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $?
0
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ ls foobar barfoo > stdout.txt
ls: cannot access 'barfoo': No such file or directory
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ ls foobar barfoo 2> stderr.txt
foobar
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ ls foobar barfoo &> stdoutandstderr.txt
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ cat stdout.txt
foobar
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ cat stderr.txt
ls: cannot access 'barfoo': No such file or directory
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ cat stdoutandstderr.txt
ls: cannot access 'barfoo': No such file or directory
foobar
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ #redirecting stdin
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ cat > file.txt
i am using keyboard input.
Cat command reads my keyboard input, converts it to stdout and instantly redirects to file1.txt
Until I press CTRL+Dspandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ cat < file.txt
i am using keyboard input.
Cat command reads my keyboard input, converts it to stdout and instantly redirects to file1.txt
```

# Numeric/String Comparison

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ a=4
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ b=8
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ [ $a -lt $b ]
[4: command not found
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ [ $a -lt $b ]
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $?
0
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ [ $a -gt $b ]
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $?
1
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ [ $a -eq $b ]
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $?
1
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ [ $a -ne $b ]
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $?
0
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ [ "apples" = "oranges" ]
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $?
1
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ str1="apples"
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ str2="oranges"
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ [ $str1 = $str2 ]
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $?
1
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ nano hello.sh
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bash hello.sh
Are apples and oranges equal? [ apples = oranges ]
0
is 200 equal to 200? [ 200 -eq 200 ]
0
```

# Conditional statements

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ if test -e ~/.bashrc;then
> echo "/.bashrc exists"
> elif test -e ~/.bash profile;then echo "~/.bash profile exists"
> else echo "not bash"
> fi
/.bashrc exists
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ a=4
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ if ((a==4)); then echo yes; else echo no ; fi
yes
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ if (((a-5)==0)); then echo yes; else echo no ; fi
no
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ if ((a<10)); then echo yes; else echo no ; fi
bash: syntax error near unexpected token `then'
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ if ((a<10)); then echo yes; else echo no ; fi
yes
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ if ((a=5)); then echo yes; else echo no ; fi
yes
```

# Bash Arithmetic

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ a=$((16-7))
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $a
9
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ b=$((2*4))
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $b
8
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ d=$((6/4))
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $d
1
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ a=3;b=27
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ c=$((a*b))
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $c
81
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ expr 5 + 9
14
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ expr 7\*8
7*8
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ expr 7 \|* 8
56
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ expr 70 / 8
8
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ let a=3+9
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $a
12
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ let b=8*($a-7)
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $b
40
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ let c=$((b**3))/6
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $c
10666
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ let a++
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $a
13
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ let b--
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $b
39
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo '5.6/8.9' | bc
0
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo '15.6/8.9' | bc
1
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo 'scale=2;15.6/8.9' | bc
1.75
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo 'scale=20;15.6/8.9' | bc
1.75280898876404494382
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ d=$(( echo 'scale=40;sqrt(46)' | bc))
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ echo $d
6.7823299831252681390645563266259691051957
```

```
spandan@spandan-Victus-by-HP-Gaming-Laptop-15-fa0xxx:~/Desktop/dtl-assignments$ bc
bc 1.07.1
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This is free software with ABSOLUTELY NO WARRANTY.
For details type `warranty'.
2022-1999
23
(559-99)*6
2760
3^3;7^4
27
2401
a=6.77
a*45
304.65
scale=4
55/8
6.8750
```