DTL ASSIGNMENT – Bash Scripting

Name - Harshal Nandavane

Mis - 112103095

Div - 2 **Batch** - S1

1. Making new file and entering text into it
2. Making the file executable
3. Listing all the files in directory
4. Executing the file

```
harshal@Harshal:~$ echo echo Hello World! > hello_world.sh
harshal@Harshal:~$ chmod 755 hello_world.sh
harshal@Harshal:~$ ls
 112103095  'Academic Calender 2021-22-SY-UG.pdf'   hello_world.sh
harshal@Harshal:~$ bash hello_world.sh
Hello World!
harshal@Harshal:~$
```

1. Adding multiple lines to a file
2. Changing permission of the file created
3. Listing all the files in the directory
4. Executing the file

```
harshal@Harshal:~$ cat << ALLDONE > multiline.sh
> echo This is a linux operating system.
> echo I am Harshal From SY Computer.
> echo I am exploring the dash scripting.
> echo This is a DTL Assignments
> ALLDONE
harshal@Harshal:~$ chmod 755 multiline.sh
harshal@Harshal:~$ ls
 112103095  'Academic Calender 2021-22-SY-UG.pdf'   hello_world.sh   multiline.sh
harshal@Harshal:~$ bash multiline.sh
This is a linux operating system.
I am Harshal From SY Computer.
I am exploring the dash scripting.
This is a DTL Assignments
harshal@Harshal:~$
```

1. Opening Downloads directory
2. Creating a new file with current timestamp
3. Opening the file
4. Changing permissions
5. Listing the files in the directory
6. Executing the file

```
harshal@Harshal:~/112103095/DTL$ ls
harshal@Harshal:~/112103095/DTL$ touch index.sh
harshal@Harshal:~/112103095/DTL$ nano index.sh
harshal@Harshal:~/112103095/DTL$ chmod 755 index.sh
harshal@Harshal:~/112103095/DTL$ ls
index.sh
harshal@Harshal:~/112103095/DTL$ bash index.sh
Hello World
harshal@Harshal:~/112103095/DTL$
```

```
  GNU nano 6.2                          hello_word.sh *
#! /bin/bash -xv

# DTL ASSIGNMENT - Bash Scripting

echo "welcome to Nano Editor"
```

Special Parameters:

```
  GNU nano 6.2                          file.sh *
#! /bin/bash -xv

echo ${8} ${1} ${18} ${19} ${8} ${1} ${13}
```

```
harshal@Harshal:~/112103095/DTL$ nano file.sh
harshal@Harshal:~/112103095/DTL$ chmod 755 file.sh
harshal@Harshal:~/112103095/DTL$ bash file.sh {A..Z}
H A R S H A M
harshal@Harshal:~/112103095/DTL$
```

Exploring all special parameters:

```
  GNU nano 6.2                          file1.sh *
#! /bin/bash

echo
echo $* Represents all arguments as single string
echo
echo $@ All arguments are shown as array
echo
echo $# Total number of arguments
echo
echo $- current flag positions
echo
echo $$ PID of the shell
echo
echo $! PID of the last executed BG command
echo
echo $0 script name
echo
echo $_ final argument of last executed foreground command
echo
echo $? Represents exit code of last command
echo
```

y

```
harshal@Harshal:~/112103095/DTL$ nano file1.sh
harshal@Harshal:~/112103095/DTL$ bash file1.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 Represents all arguments as
 single string

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 All arguments are shown as
array

26 Total number of arguments

hB current flag positions

88 PID of the shell

PID of the last executed BG command

file1.sh script name

echo final argument of last executed foreground command

0 Represents exit code of last command
```

Bracket Expansion:

```
harshal@Harshal:~/112103095/DTL$ echo a{b,c,d}e
abe ace ade
harshal@Harshal:~/112103095/DTL$ 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
harshal@Harshal:~/112103095/DTL$
```

```
harshal@Harshal:~/112103095/DTL$ cd new
harshal@Harshal:~/112103095/DTL/new$ ls
harshal@Harshal:~/112103095/DTL/new$ mkdir a{1..10}
harshal@Harshal:~/112103095/DTL/new$ ls
a1  a10  a2  a3  a4  a5  a6  a7  a8  a9
harshal@Harshal:~/112103095/DTL/new$
```

```
harshal@Harshal:~/112103095/DTL/new$ echo $BASH
/bin/bash
harshal@Harshal:~/112103095/DTL/new$
```

Using variables:

```
  GNU nano 6.2                          file2.sh *
#! /bin/bash

name="Sundar Pichai"
echo ${name} is an Indian origin Successfull person
```

```
harshal@Harshal:~/112103095/DTL$ nano file2.sh
harshal@Harshal:~/112103095/DTL$ chmod 755 file2.sh
harshal@Harshal:~/112103095/DTL$ ./file2.sh
Sundar Pichai is an Indian origin Successfull person
harshal@Harshal:~/112103095/DTL$
```

```
  GNU nano 6.2                          file2.sh *
#! /bin/bash

name="Sundar Pichai"
company="Google"
position="CEO"
echo ${name} is an Indian origin Successfull person. He is the ${position}
of ${company}.
```

```
harshal@Harshal:~/112103095/DTL$ nano file2.sh
harshal@Harshal:~/112103095/DTL$ ./file2.sh
Sundar Pichai is an Indian origin Successfull person. He is the CEO of Google.
harshal@Harshal:~/112103095/DTL$
```

Arithmetic Expansion:

```
harshal@Harshal:~/112103095/DTL$ nano math.sh
harshal@Harshal:~/112103095/DTL$ chmod 755 math.sh
harshal@Harshal:~/112103095/DTL$ ./math.sh
x=3 and y=5
x+y=8
8
x=8

x=9

y=-1

x=2
harshal@Harshal:~/112103095/DTL$
```

```
  GNU nano 6.2                          math.sh
#! /bin/bash

x=3
y=5
echo x=${x} and y=${y}
echo x+y=$((x+y))
echo $((x=x+y))
echo x=${x}
((x++))
echo
echo x=${x}
echo
unset y
((y--))
echo y=${y}
echo
x=1
let x++
echo x=${x}
```

Command Substitution:

```
harshal@Harshal:~/112103095/DTL$ file math.sh
math.sh: Bourne-Again shell script, ASCII text executable
harshal@Harshal:~/112103095/DTL$
```

```
  GNU nano 6.2                          file3.sh *
#! /bin/bash

greeting="Congratulations"
user=$(whoami)
date=$(date +%F)

echo "$greeting dear $user! Toady is $date"
echo "Your bash shell version is: $BASH_VERSION!!!"
```

```
harshal@Harshal:~/112103095/DTL$ nano file3.sh
harshal@Harshal:~/112103095/DTL$ chmod 755 file3.sh
harshal@Harshal:~/112103095/DTL$ ./file3.sh
Congratulations dear harshal! Toady is 2023-01-22
Your bash shell version is: 5.1.16(1)-release!!!
harshal@Harshal:~/112103095/DTL$
```

```
harshal@Harshal:~/112103095/DTL$ a=23
harshal@Harshal:~/112103095/DTL$ b=49
harshal@Harshal:~/112103095/DTL$ echo $a
23
harshal@Harshal:~/112103095/DTL$ echo $b
49
harshal@Harshal:~/112103095/DTL$ echo $[$a + $b]
72
harshal@Harshal:~/112103095/DTL$
```

Creating Backup:

```
  GNU nano 6.2                          file4.sh *
#! /bin/bash
# This bash Script is used to backed a user's home directory to /test/.

user=$(whoami)
input=/home/${user}
output=/tmp/${user}_home_$(date +%Y-%m-%d_%H%M%S).tar.gz

tar -cvf $output $input

echo "$input Backup is Complete! Details of backup are:"
ls -l $output
```

env

```
harshal@Harshal:~/112103095/DTL$ ./file4.sh
tar: Removing leading `/' from member names
/home/harshal/
/home/harshal/.sudo_as_admin_successful
/home/harshal/.bash_history
/home/harshal/hello_world.sh
/home/harshal/.motd_shown
/home/harshal/.config/
/home/harshal/.config/procps/
/home/harshal/multiline.sh
/home/harshal/.profile
/home/harshal/.bash_logout
/home/harshal/Academic Calender 2021-22-SY-UG.pdf
```

```
/home/harshal/112103095/file1
/home/harshal/112103095/hello_word.sh
/home/harshal/112103095/file
/home/harshal/112103095/newarchive.tar
/home/harshal/112103095/a.c/
/home/harshal/112103095/new.zip
/home/harshal/112103095/index.html
/home/harshal Backup is Complete! Details of backup are:
-rw-r--r-- 1 harshal harshal 378880 Jan 22 20:07 /tmp/harshal_home_2023-01-22_2
00721.tar.gz
```

Environment:

```
harshal@Harshal:~/112103095/DTL$ env
SHELL=/bin/bash
WSL_DISTRO_NAME=Ubuntu
WT_SESSION=31ca3cb1-66d1-4f33-b429-b690d23c0b47
NAME=Harshal
PWD=/home/harshal/112103095/DTL
LOGNAME=harshal
HOME=/home/harshal
LANG=C.UTF-8
WSL_INTEROP=/run/WSL/9_interop
LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33;01:c
d=40;33;01:or=40;31;01:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:st=37
;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj=01;31:*.taz=01;31:*.lha=
01;31:*.lz4=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=01;31:*.tzo=01;31:
*.t7z=01;31:*.zip=01;31:*.z=01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*.lz=01;31:
*.lzo=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01;31:*.bz=01;31:*.tbz=01
;31:*.tbz2=01;31:*.tz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.e
ar=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=01;31:*.zoo=01;31:*.cpio=01;
31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;31:*.dwm=01;31:*.esd=
01;31:*.jpg=01;35:*.jpeg=01;35:*.mjpg=01;35:*.mjpeg=01;35:*.gif=01;35:*.bmp=01;
35:*.pbm=01;35:*.pgm=01;35:*.ppm=01;35:*.tga=01;35:*.xbm=01;35:*.xpm=01;35:*.ti
f=01;35:*.tiff=01;35:*.png=01;35:*.svg=01;35:*.svgz=01;35:*.mng=01;35:*.pcx=01;
35:*.mov=01;35:*.mpg=01;35:*.mpeg=01;35:*.m2v=01;35:*.mkv=01;35:*.webm=01;35:*.
webp=01;35:*.ogm=01;35:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vob=01;35:*.qt=01
;35:*.nuv=01;35:*.wmv=01;35:*.asf=01;35:*.rm=01;35:*.rmvb=01;35:*.flc=01;35:*.a
vi=01;35:*.fli=01;35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf=01;35:*.xwd=01;35:
*.yuv=01;35:*.cgm=01;35:*.emf=01;35:*.ogv=01;35:*.ogx=01;35:*.aac=00;36:*.au=00
;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.midi=00;36:*.mka=00;36:*.mp3=00;36:*
```

```
harshal@Harshal:~/112103095/DTL$ cat/etc/environment
-bash: cat/etc/environment: No such file or directory
harshal@Harshal:~/112103095/DTL$
```

```
harshal@Harshal:~/112103095/DTL$ cat /etc/profile
# /etc/profile: system-wide .profile file for the Bourne shell (sh(1))
# and Bourne compatible shells (bash(1), ksh(1), ash(1), ...).

if [ "${PS1-}" ]; then
  if [ "${BASH-}" ] && [ "$BASH" != "/bin/sh" ]; then
    # The file bash.bashrc already sets the default PS1.
    # PS1='\h:\w\$ '
    if [ -f /etc/bash.bashrc ]; then
      . /etc/bash.bashrc
    fi
  else
    if [ "$(id -u)" -eq 0 ]; then
      PS1='# '
    else
      PS1='$ '
    fi
  fi
fi

if [ -d /etc/profile.d ]; then
  for i in /etc/profile.d/*.sh; do
    if [ -r $i ]; then
      . $i
    fi
  done
  unset i
fi
harshal@Harshal:~/112103095/DTL$
```

Input and Output Redirection:

```
harshal@Harshal:~/112103095/DTL$ ls -l foobar
-rw-r--r-- 1 harshal harshal 0 Jan 22 20:13 foobar
harshal@Harshal:~/112103095/DTL$
```

```
harshal@Harshal:~/112103095/DTL$ ~/.bashrc
-bash: /home/harshal/.bashrc: Permission denied
harshal@Harshal:~/112103095/DTL$ cmd <x.in
-bash: x.in: No such file or directory
harshal@Harshal:~/112103095/DTL$ touch footbar
harshal@Harshal:~/112103095/DTL$ ls -l foobar
-rw-r--r-- 1 harshal harshal 0 Jan 22 20:13 foobar
harshal@Harshal:~/112103095/DTL$ ls -l foobar barfoo
ls: cannot access 'barfoo': No such file or directory
-rw-r--r-- 1 harshal harshal 0 Jan 22 20:13 foobar
harshal@Harshal:~/112103095/DTL$ ls -l foobar barfoo > stdout.txt
ls: cannot access 'barfoo': No such file or directory
harshal@Harshal:~/112103095/DTL$ ls -l foobar barfoo 2> stdout.txt
-rw-r--r-- 1 harshal harshal 0 Jan 22 20:13 foobar
harshal@Harshal:~/112103095/DTL$ ls -l foobar barfoo &> stdout.txt
harshal@Harshal:~/112103095/DTL$ cat stdout.txt
ls: cannot access 'barfoo': No such file or directory
-rw-r--r-- 1 harshal harshal 0 Jan 22 20:13 foobar
harshal@Harshal:~/112103095/DTL$
```

Functions:

```
harshal@Harshal:~/112103095/DTL$ function status { date; uptime; who I grep $US
ER;}
harshal@Harshal:~/112103095/DTL$ status
Sun Jan 22 20:18:46 IST 2023
 20:18:46 up  1:41,  0 users,  load average: 0.00, 0.00, 0.00
who: extra operand ‘harshal’
Try 'who --help' for more information.
harshal@Harshal:~/112103095/DTL$
```

```
harshal@Harshal:~/112103095/DTL$ my_function () { echo "Hello I'am a function";
echo "Bye!";}
harshal@Harshal:~/112103095/DTL$ my_function function
Hello I'am a function
Bye!
harshal@Harshal:~/112103095/DTL$ bash --debugger
harshal@Harshal:~/112103095/DTL$ declare -F my_function
harshal@Harshal:~/112103095/DTL$ declare -f my_function
harshal@Harshal:~/112103095/DTL$ unset my_function
harshal@Harshal:~/112103095/DTL$ my_function
my_function: command not found
harshal@Harshal:~/112103095/DTL$
```

Numeric and String comparison:

```
harshal@Harshal:~/112103095/DTL$ a=1
harshal@Harshal:~/112103095/DTL$ b=2
harshal@Harshal:~/112103095/DTL$ [ $a -lt $b ]
harshal@Harshal:~/112103095/DTL$ echo $?
0
harshal@Harshal:~/112103095/DTL$ [ $a -gt $b ]
harshal@Harshal:~/112103095/DTL$ echo $?
1
harshal@Harshal:~/112103095/DTL$ [ $a -eq $b ]
harshal@Harshal:~/112103095/DTL$ echo $?
1
harshal@Harshal:~/112103095/DTL$
```

```
harshal@Harshal:~/112103095/DTL$ [ "applies" = "oranges" ]
harshal@Harshal:~/112103095/DTL$ echo $?
1
harshal@Harshal:~/112103095/DTL$
```

```
harshal@Harshal:~/112103095/DTL$ str1="apples"
harshal@Harshal:~/112103095/DTL$ str2="oranges"
harshal@Harshal:~/112103095/DTL$ [ $str1 = $str2 ]
harshal@Harshal:~/112103095/DTL$ echo $?
1
```

Conditional statements:

```
 GNU nano 6.2                          file5.sh *
#! /bin/bash

a=14
if ((a==20))
then echo YES;
else
echo NO;
fi
```

```
harshal@Harshal:~/112103095/DTL$ nano file5.sh
harshal@Harshal:~/112103095/DTL$ chmod 755 file5.sh
harshal@Harshal:~/112103095/DTL$ ./file5.sh
NO
harshal@Harshal:~/112103095/DTL$
```

Arithmetic Expression:

```
harshal@Harshal:~/112103095/DTL$ echo $((27+35))
62
harshal@Harshal:~/112103095/DTL$ echo $((163-245))
-82
harshal@Harshal:~/112103095/DTL$ echo $((4*16))
64
harshal@Harshal:~/112103095/DTL$ echo $((144/12))
12
```

```
harshal@Harshal:~/112103095/DTL$ m=40;n=5
harshal@Harshal:~/112103095/DTL$ echo $(( $m * $n))
200
harshal@Harshal:~/112103095/DTL$ expr 7 + 17
24
harshal@Harshal:~/112103095/DTL$ expr 7 - 17
-10
harshal@Harshal:~/112103095/DTL$ expr 18 / 3
6
harshal@Harshal:~/112103095/DTL$ let x=8+22
harshal@Harshal:~/112103095/DTL$ echo $x
30
```

```
harshal@Harshal:~/112103095/DTL$ let y=4*($x-1)
harshal@Harshal:~/112103095/DTL$ echo $y
116
harshal@Harshal:~/112103095/DTL$ let z=($y**3)/2
harshal@Harshal:~/112103095/DTL$ echo $z
780448
harshal@Harshal:~/112103095/DTL$ let z++
harshal@Harshal:~/112103095/DTL$ echo $z
780449
harshal@Harshal:~/112103095/DTL$
```