

DTL Assignment: Bash Scripting

Name:Abhinandan Raju Jugale

MIS:112103062

Div:1

Batch:S4

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

```
abhi_6@Abhi-6: ~  
abhi_6@Abhi-6:~$ echo echo Hello World! >hello_world.sh  
abhi_6@Abhi-6:~$ chmod 755 hello_world.sh  
abhi_6@Abhi-6:~$ ls  
7930      Linux_Commands  file2.txt  file5.txt  first      newarchive.tar  third.html  
Ass_7.c  file1.txt      file4.txt  file6.txt  hello_world.sh  sample.txt  
abhi_6@Abhi-6:~$ bash hello_world.sh  
Hello World!  
abhi_6@Abhi-6:~$
```

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

```
abhi_6@Abhi-6:~$ cat << ALLDONE >hello_world_multiline.sh  
> echo My MIS is 112103062.  
> echo Hello,I am Abhi Jugale.  
> echo this is multiline file.  
> ALLDONE  
abhi_6@Abhi-6:~$ chmod 755 hello_world_multiline.sh  
abhi_6@Abhi-6:~$ ls  
7930      file1.txt  file5.txt  hello_world.sh  sample.txt  
Ass_7.c   file2.txt  file6.txt  hello_world_multiline.sh  third.html  
Linux_Commands  file4.txt  first      newarchive.tar  
abhi_6@Abhi-6:~$ bash hello_world_multiline.sh  
My MIS is 112103062.  
Hello,I am Abhi Jugale.  
this is multiline file.  
abhi_6@Abhi-6:~$
```

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

```
abhi_6@Abhi-6:~$ mkdir DTL
abhi_6@Abhi-6:~$ cd DTL
abhi_6@Abhi-6:~/DTL$ touch hello_world.sh
abhi_6@Abhi-6:~/DTL$ nano hello_world.sh
abhi_6@Abhi-6:~/DTL$ cd DTL
-bash: cd: DTL: No such file or directory
abhi_6@Abhi-6:~/DTL$ ls
hello_world.sh
abhi_6@Abhi-6:~/DTL$ mkdir DTL
abhi_6@Abhi-6:~/DTL$ cd DTL
abhi_6@Abhi-6:~/DTL/DTL$ touch hello.sh
abhi_6@Abhi-6:~/DTL/DTL$ nano hello.sh
abhi_6@Abhi-6:~/DTL/DTL$ chmod +x hello.sh
abhi_6@Abhi-6:~/DTL/DTL$ ./hello.sh
Hii,I am Abhi.
abhi_6@Abhi-6:~/DTL/DTL$
```



```
abhi_6@Abhi-6: ~
GNU nano 6.2 hello_world.sh
echo Hello World!
```

Exploring all special parameters:

```
abhi_6@Abhi-6: ~
GNU nano 6.2 file2.sh
echo
echo $* Represents all arguments as single string
echo
echo $@ Represents all arguments as an array rather than a string
echo
echo $# Total number of positional arguments
echo
echo $- Current flag position
echo
echo $$ PID of the shell
echo
echo $! PID of the last executed background command
echo
echo $0 Name of the shell or shell script
echo
echo $_ Final argument of the last executed foreground command
echo
echo $? Represents exit status of the last executed foreground command
echo
```

```
abhi_6@Abhi-6:~/DTL/DTL$ nano file1.sh
abhi_6@Abhi-6:~/DTL/DTL$ chmod 755 file1.sh
abhi_6@Abhi-6:~/DTL/DTL$ ls
file1.sh hello.sh
abhi_6@Abhi-6:~/DTL/DTL$ bash file1.sh {A..Z}
A B C I
abhi_6@Abhi-6:~/DTL/DTL$
```

```
abhi_6@Abhi-6:~$ nano file2.sh
abhi_6@Abhi-6:~$ bash file2.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 Represents all arguments as an array rather than a string
26 Total number of positional arguments
hB Current flag position
168 PID of the shell
PID of the last executed background command
file2.sh Name of the shell or shell script
echo Final argument of the last executed foreground command
0 Represents exit status of the last executed foreground command
abhi_6@Abhi-6:~$
```

Bracket Expansion:

```
abhi_6@Abhi-6: ~  
abhi_6@Abhi-6:~$ echo a{b,d,c}e  
abe ade ace  
abhi_6@Abhi-6:~$ 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  
abhi_6@Abhi-6:~$ mkdir z{1..10}  
abhi_6@Abhi-6:~$ ls  
7930      Linux_Commands  file2.txt  file6.txt  hello_world_multiline.sh  third.html  z2  z5  z8  
Ass_7.c  file1.txt  file4.txt  first      newarchive.tar  z1  z3  z6  z9  
DTL      file2.sh  file5.txt  hello_world.sh  sample.txt  z10  z4  z7  
abhi_6@Abhi-6:~$ echo $bash  
  
abhi_6@Abhi-6:~$ echo $bash  
  
abhi_6@Abhi-6:~$ echo $bash/bin/bash  
/bin/bash  
abhi_6@Abhi-6:~$
```

Using variables

```
abhi_6@Abhi-6: ~  
abhi_6@Abhi-6:~$ nano variable.sh  
abhi_6@Abhi-6:~$ chmod 755 variable.sh  
abhi_6@Abhi-6:~$ ./variable.sh  
My name is Abhinanan Jugale.  
abhi_6@Abhi-6:~$
```

```
abhi_6@Abhi-6: ~  
GNU nano 6.2  
name="Abhinanan Jugale"  
echo My name is ${name}.
```

```
abhi_6@Abhi-6: ~
GNU nano 6.2
roommates.sh
mate1=Vipul
mate2=Tejas
mate3=Viraj
mate4=Dhomse
echo ${mate1},${mate2},${mate3},${mate4} are my roommates.
```

```
abhi_6@Abhi-6:~$ nano arithmetic.sh
abhi_6@Abhi-6:~$ chmod 755 arithmetic.sh
abhi_6@Abhi-6:~$ ./arithmeic.sh
-bash: ./arithmeic.sh: No such file or directory
abhi_6@Abhi-6:~$ ./arithmetic.sh
a=15 and b=20
a+b=35
15

16
-1
2
abhi_6@Abhi-6:~$
```

```
Select abhi_6@Abhi-6: ~
GNU nano 6.2
arithmetic.sh
a=15
b=20

echo a-${a} and b-${b}
echo a+b=$((a+b))
echo ${a}
((a++))
echo
echo ${a}
unset b
((b--))
echo ${b}
a=1
let a++
echo ${a}
```

Command Substitution

```
2
abhi_6@Abhi-6:~$ file arithmetic.sh
arithmetic.sh: ASCII text
abhi_6@Abhi-6:~$
```

```
abhi_6@Abhi-6:~$ nano greetings.sh
abhi_6@Abhi-6:~$ chmod 755 greetings.sh
abhi_6@Abhi-6:~$ ./greetings.sh
Hii,Welcome abhi_6 Today is 2023-02-06
Your bash shell version is: 5.1.16(1)-release.!
```

```
abhi_6@Abhi-6: ~
GNU nano 6.2 greetings.sh
greeting="Hii,Welcome"
user=$(whoami)
date=$(date +%F)

echo "$greeting $user Today is $date"
echo "Your bash shell version is: $BASH_VERSION.!"
```

```
abhi_6@Abhi-6: ~

abhi_6@Abhi-6:~$ a=25
abhi_6@Abhi-6:~$ b=12
abhi_6@Abhi-6:~$ echo $a
25
abhi_6@Abhi-6:~$ echo $b
12
abhi_6@Abhi-6:~$ echo $[$a+$b]
37
abhi_6@Abhi-6:~$
```

Creating backup:

```
37
abhi_6@Abhi-6:~$ nano file3.sh
abhi_6@Abhi-6:~$ chmod 755 file3.sh
abhi_6@Abhi-6:~$ ./file3.sh
tar: Removing leading `/' from member names
/home/abhi_6/
/home/abhi_6/.bashrc
/home/abhi_6/.bash_history
/home/abhi_6/.bash_logout
/home/abhi_6/.config/
/home/abhi_6/.config/procps/
/home/abhi_6/.lessht
/home/abhi_6/.local/
/home/abhi_6/.local/share/
/home/abhi_6/.local/share/nano/
/home/abhi_6/.motd_shown
/home/abhi_6/.profile
/home/abhi_6/.sudo_as_admin_successful
/home/abhi_6/7930
/home/abhi_6/arithmetic.sh
/home/abhi_6/Ass_7.c
/home/abhi_6/DTL/
/home/abhi_6/DTL/DTL/
/home/abhi_6/DTL/DTL/file1.sh
/home/abhi_6/DTL/DTL/file2.sh.save
/home/abhi_6/DTL/DTL/hello.sh
/home/abhi_6/DTL/hello_world.sh
/home/abhi_6/file1.txt
/home/abhi_6/file2.sh
/home/abhi_6/file2.txt
/home/abhi_6/file3.sh
/home/abhi_6/file4.txt
/home/abhi_6/file5.txt
/home/abhi_6/file6.txt
/home/abhi_6/first/
/home/abhi_6/greetings.sh
/home/abhi_6/hello_world.sh
/home/abhi_6/hello_world_multiline.sh
/home/abhi_6/Linux_Commands/
/home/abhi_6/Linux_Commands/Linux_Commands/
/home/abhi_6/newarchive.tar
/home/abhi_6/roommates.sh
```

```
abhi_6@Abhi-6:~$ sudo apt-get install -y net-tools nmap curl  

abhi_6@Abhi-6:~$ env  

SHELL=/bin/bash  

PS1_DISTRO_NAME=Ubuntu  

NAME=Abhi-6  

HOME=/home/abhi_6  

LANG=C.UTF-8  

XDG_COLORS=s-o:d1=01;34;ln=01;36;mh=00;p1=40;33;so=01;35;d0=01;35;bdc=40;33;01;c=d=40;33;01;r=o=40;31;01;mi=00;su=37;41;sg=30;43;ca=30;41;t=w=30;42;ow=34;42;st=37;44;ex=01;32;*.*tar=01;31*.*tgz=01;31*.*tzt=01;31*.*lha=01;31*.*lz4=01;31*.*lzh=01;31*.*lzm=01;31*.*txz=01;31*.*tzo=01;31*.*tZ=01;31*.*zip=01;31*.*ze=01;31*.*dz=01;31*.*lrz=01;31*.*lz=01;31*.*lzo=01;31*.*bz=01;31*.*bz2=01;31*.*bZ=01;31*.*tbz=01;31*.*tbz2=01;31*.*tBz=01;31*.*deb=01;31*.*rpm=01;31*.*jar=01;31*.*war=01;31*.*ear=01;31*.*sar=01;31*.*rar=01;31*.*alz=01;31*.*ace=01;31*.*lisp=01;31*.*gz=01;31*.*cab=01;31*.*wim=01;31*.*swm=01;31*.*dwm=01;31*.*esd=01;31*.*jpg=01;31*.*jpeg=01;35*.*mjpeg=01;35*.*mpeg=01;35*.*gif=01;35*.*bmp=01;35*.*pbm=01;35*.*ppm=01;35*.*xpm=01;35*.*tif=01;35*.*tiff=01;35*.*svg=01;35*.*svgz=01;35*.*mov=01;35*.*mpg=01;35*.*mpeg=01;35*.*m2v=01;35*.*mkv=01;35*.*webm=01;35*.*webp=01;35*.*md=01;35*.*mpdv=01;35*.*vob=01;35*.*at=01;35*.*nuv=01;35*.*nm=01;35*.*sm=01;35*.*rmvb=01;35*.*flc=01;35*.*avi=01;35*.*fli=01;35*.*rlv=01;35*.*dl=01;35*.*d1=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*.*mda=00;36*.*mid=00;36*.*midi=00;36*.*mka=00;36*.*mp3=00;36*.*mpc=00;36*.*ogg=00;36*.*ra=00;36*.*opus=00;36*.*spk=00;36*.*xspf=00;36*.*  

LESSCLOSE=/usr/bin/lesspipe %s %s  

TERM=xterm-256color  

LESSOPEN=| /usr/bin/lesspipe %s  

USER=abhi_6  

SHLVL=1  

_="/usr/local/share:/usr/share:/var/lib/snapd/desktop"  

PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/mnt/c/Program Files/WindowsApps/CanonicalGroupLimited.Ubuntu_2204.1.8.0_x64__79rhkp1fndgsc/m...  

11.6/bin;/usr/f/f/oracle/MadhuarajJugale/product/12.2.0/client_1/bin;/mnt/f/f/instantclient_12_2/mnt/f/f/app/MadhuarajJugale/product/12.1.0/client_1/mnt/f/f/app/MadhuarajJugale/product/12.2.0/clien...  

rajJugale/Desktop/sql;/mnt/c/tools/ruby26/bin;/mnt/c/Program Files/Java/jdk1.8.0_201/bin;/mnt/c/Program Files/Java/jre1.8.0_201/mnt/c/Program Files (x86)/Common Files/Oracle/Java/javapath...  

AR/RATION\1\NUTCROOT;/mnt/c/PROGRA~2\RATIONAL/RATION\1\NUTCROOT;\mskt:/mnt/c/Program Files (x86)/Intel/iCLS Client;/mnt/c/Program Files/Intel/iCLS Client;/mnt/c/WINDOWS/System32;/mnt...  

System32\Wbem;/mnt/c/WINDOWS/System32/WindowsPowerShell\v1.0;/mnt/c/Program Files (x86)/Intel/Intel(R) Management Engine Components/DAL;/mnt/c/Program Files/Intel/Intel(R) Management En...  

Component Files (x86)/Intel/Intel(R) Management Engine Components/IPT;/mnt/c/Program Files/Intel/Intel(R) Management Engine Components/IPT;/mnt/c/WINDOWS/System32/OpenSSH;/mnt/c/Progra...  

gramData/ClearQuest;/mnt/c/Program Files (x86)/Rational/Rose/TopLink;/mnt/c/Program Files (x86)/Rational/Rational Test;/mnt/c/Program Files/Java/jdk1.8.0...  

rogramData/chocolatey/bin;/mnt/c/Program Files/Foxit Software/Foxit Reader;/mnt/c/MinGW/bi...  

nburg/Anaconda3/scripts;/mnt/c/Users/Madhuraj Jugal/Ancoda3/Scripts;/mnt/c/Users/Madhuraj Jugal/Ancoda3/Library/bin;/mnt/c/Program Files/Git/cmd;/mnt/c/Program Files/PuTTY/pu...  

/L/Programs/Python/Python36/Scripts;/mnt/c/Users/Madhuraj Jugal/AppData/Local/Programs/Python/Python36;/mnt/c/RailsInstaller/Git/cmd;/mnt/c/RailsInstaller/Ruby\3.3/bin;/mnt/c/Users/Madu...  

al/Microsoft/WindowsApps;/mnt/c/Users/Madhuraj Jugal/AppData/Roaming/nvm;/mnt/c/Users/Madhuraj Jugal/AppData/Local/Yarn/bin;/mnt/c/Program Files/heroku/bin;/mnt/c/Users/Madhuraj JugalDe...  

n/x64;/mnt/c/Users/Madhuraj Jugal/AppData/Local/Programs/Microsoft VS Code/bin;/mnt/f/PyCharm Community Edition 2022.3.1/bin;/snap/bin  

HOSTTYPE=x86_64  

_=usr/bin/env  

abhi_6@Abhi-6:~$
```

```
abhi_6@Abhi-6:~$ cat /etc/environment
PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin"
abhi_6@Abhi-6:~$ 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

abhi_6@Abhi-6:~$
```


Input and Output Redirection:

```
abhi_6@Abhi-6:~$ ~/.bashrc
bash: /home/abhi_6/.bashrc: Permission denied
abhi_6@Abhi-6:~$ cmd < x.in >
bash: syntax error near unexpected token `newline'
abhi_6@Abhi-6:~$ cmd <x.in
bash: x.in: No such file or directory
abhi_6@Abhi-6:~$ touch foobar
abhi_6@Abhi-6:~$ ls -l foobar
-rw-r--r-- 1 abhi_6 abhi_6 0 Feb  7 01:33 foobar
abhi_6@Abhi-6:~$ ls foobar barfoo
ls: cannot access 'barfoo': No such file or directory
foobar
abhi_6@Abhi-6:~$ ls foobar > stdout.txt
abhi_6@Abhi-6:~$ ls foobar barfoo 2> stdout.txt
foobar
abhi_6@Abhi-6:~$ ls foobar barfoo &> stdoutandstderr.txt
abhi_6@Abhi-6:~$ cat stdout.txt
ls: cannot access 'barfoo': No such file or directory
abhi_6@Abhi-6:~$ chmod 755 stdout.txt
abhi_6@Abhi-6:~$ cat stdout.txt
ls: cannot access 'barfoo': No such file or directory
abhi_6@Abhi-6:~$ cat stderr.txt
cat: stderr.txt: No such file or directory
abhi_6@Abhi-6:~$ cat stdoutandstderr.txt
ls: cannot access 'barfoo': No such file or directory
foobar
abhi_6@Abhi-6:~$ _
```


Funtion:

```
Select abhi_6@Abhi-6: ~
abhi_6@Abhi-6:~$ function status { date;uptime; who | grep $USER;}
abhi_6@Abhi-6:~$ status
Mon Feb  6 23:58:28 IST 2023
 23:58:28 up 47 min,  0 users,  load average: 0.52, 0.58, 0.59
abhi_6@Abhi-6:~$ myfunction() {echo "Hello I'm a Funtion;echo "Bye!";}
-bash: !": event not found
abhi_6@Abhi-6:~$ myfunction()
> ^C
abhi_6@Abhi-6:~$ myfunction() { echo "Hello I am a funtion"; echo "Bye!";}
abhi_6@Abhi-6:~$ myfunction
Hello I am a funtion
Bye!
abhi_6@Abhi-6:~$ bash --debugger
abhi_6@Abhi-6:~$ declare -F myfunction
abhi_6@Abhi-6:~$ declare -f myfunction
abhi_6@Abhi-6:~$ unset myfunction
abhi_6@Abhi-6:~$ myfunction
myfunction: command not found
abhi_6@Abhi-6:~$
```

Numeric and string comparisons:

 abhi_6@Abhi-6: ~

```
abhi_6@Abhi-6:~$ a=4
abhi_6@Abhi-6:~$ b=6
abhi_6@Abhi-6:~$ [ $a -lt $b ]
abhi_6@Abhi-6:~$ echo $?
0
abhi_6@Abhi-6:~$ [$a -gt $b]
[4: command not found
abhi_6@Abhi-6:~$ [ $a -gt $b]
bash: [: missing `]'
abhi_6@Abhi-6:~$ [ $a -gt $b ]
abhi_6@Abhi-6:~$ echo $?
1
abhi_6@Abhi-6:~$ [ "apples"="Bananas" ]
abhi_6@Abhi-6:~$ echo $?
0
abhi_6@Abhi-6:~$ str1="apples"
abhi_6@Abhi-6:~$ str2="Bananas"
abhi_6@Abhi-6:~$ [ $str1=$str2 ]
abhi_6@Abhi-6:~$ echo $?
0
abhi_6@Abhi-6:~$
```

 abhi_6@Abhi-6: ~

GNU nano 6.2

```
a=19
if((a==30))
then echo Yes;
else
echo No;
fi
```

```
abhi_6@Abhi-6:~$ nano fil4.sh
abhi_6@Abhi-6:~$ bash fil4.sh
No
abhi_6@Abhi-6:~$
```

Arithmetic Expression:

```
abhi_6@Abhi-6:~$ echo $(( 24+4 ))
28
abhi_6@Abhi-6:~$ echo $((46-8))
38
abhi_6@Abhi-6:~$ echo $((6*8))
48
abhi_6@Abhi-6:~$ echo $((16/8))
2
abhi_6@Abhi-6:~$ m=25;n=4
abhi_6@Abhi-6:~$ echo $(( $m * $n
100
abhi_6@Abhi-6:~$ expr 8 + 6
14
abhi_6@Abhi-6:~$ expr 8 - 6
2
abhi_6@Abhi-6:~$ expr 30 / 6
5
abhi_6@Abhi-6:~$ let x=6+55
abhi_6@Abhi-6:~$ expr $x
61
abhi_6@Abhi-6:~$
```