

Comsats University Islamabad

Operating Systems Lab

Terminal Examination

**Date: January 09, 2021**

**Total Marks: 50**

**Total Time: 3 hour 15 minutes**

**Course Instructor: Muhammad Wasif**

Name: Muhammad Haris Irfan

Roll No: FA18-BCE-090

**Instructions:**

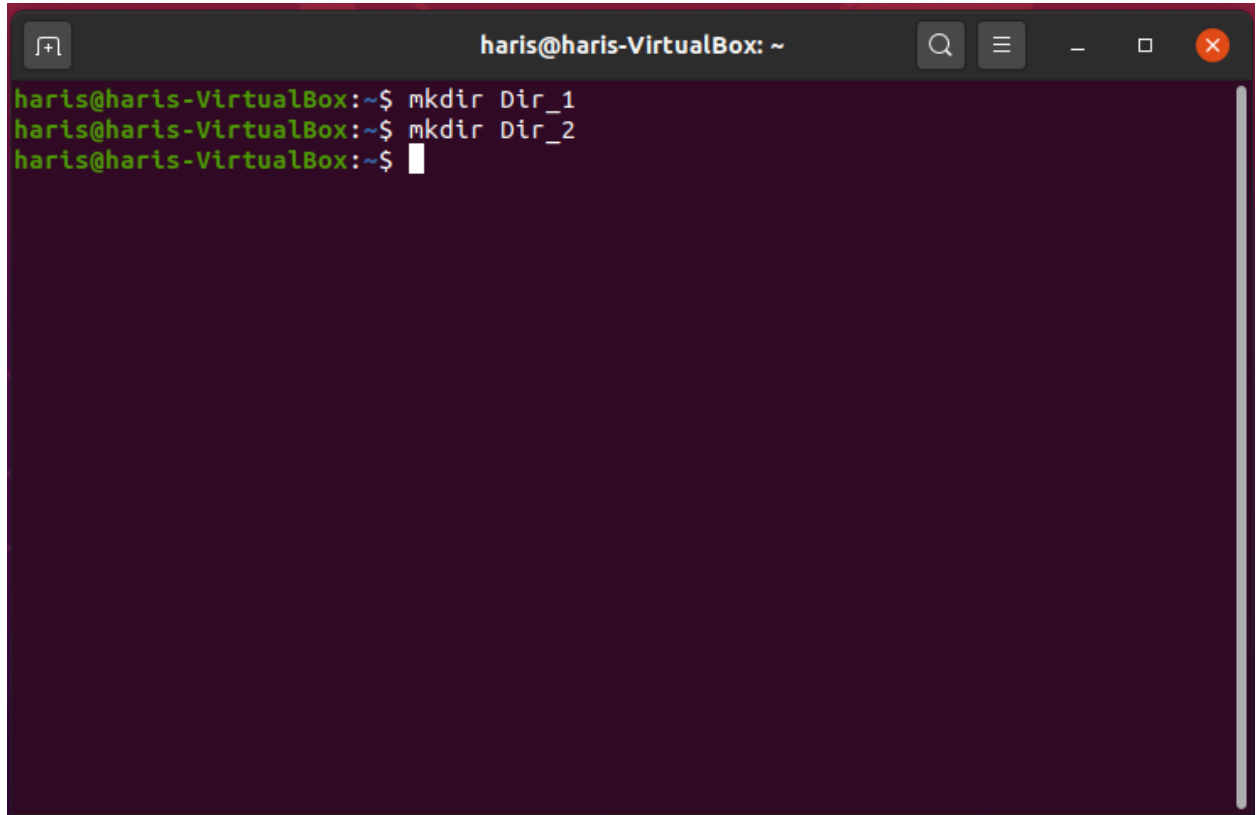
1. This is a closed-book, closed-notes examination.
2. Use online portal only for the exam and label the question number clearly to get marks.
3. Peer communication or plagiarized content from internet is strictly prohibited.
4. If viva voce needed, students can be called.

Questions No	Marks Obtained	Total Marks
Q1		15
Q2		20
Q3		15
<b>Total</b>		<b>50</b>

## Question 01

Make two directories Dir\_1, Dir\_2

1. Create two files File\_01 & File\_02 in Dir\_1 and Dir\_2 respectively

A terminal window titled 'haris@haris-VirtualBox: ~' with standard window controls. The terminal shows three lines of text: 'haris@haris-VirtualBox:~\$ mkdir Dir\_1', 'haris@haris-VirtualBox:~\$ mkdir Dir\_2', and 'haris@haris-VirtualBox:~\$' followed by a cursor. The background is dark purple.

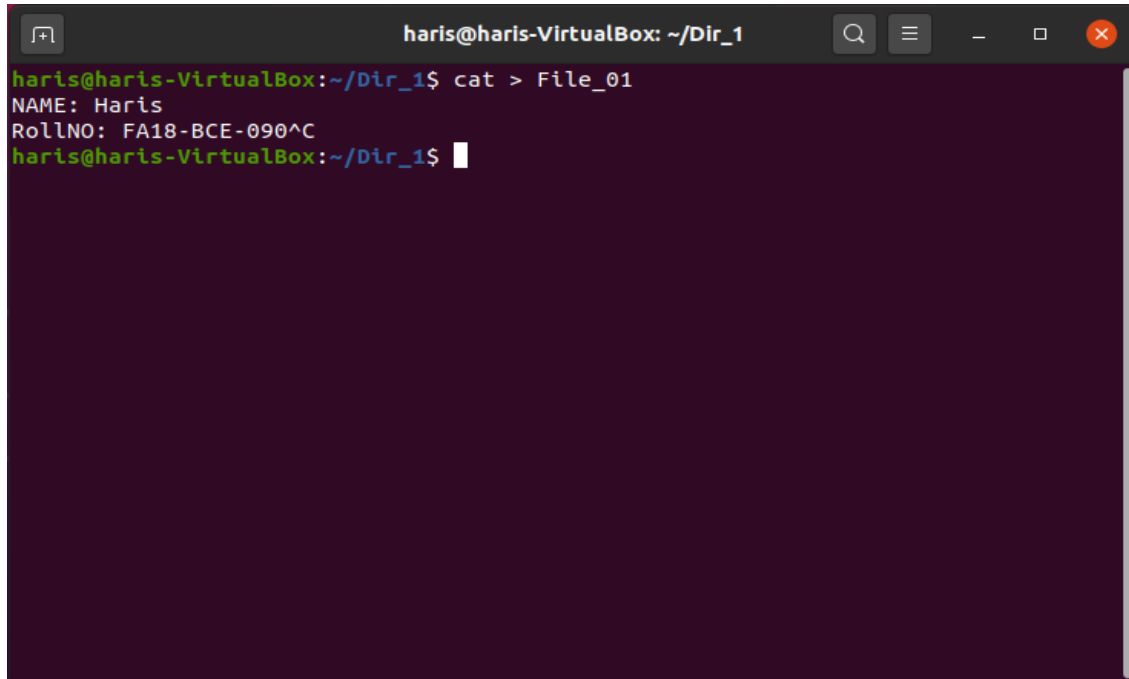
```
haris@haris-VirtualBox:~$ mkdir Dir_1
haris@haris-VirtualBox:~$ mkdir Dir_2
haris@haris-VirtualBox:~$
```

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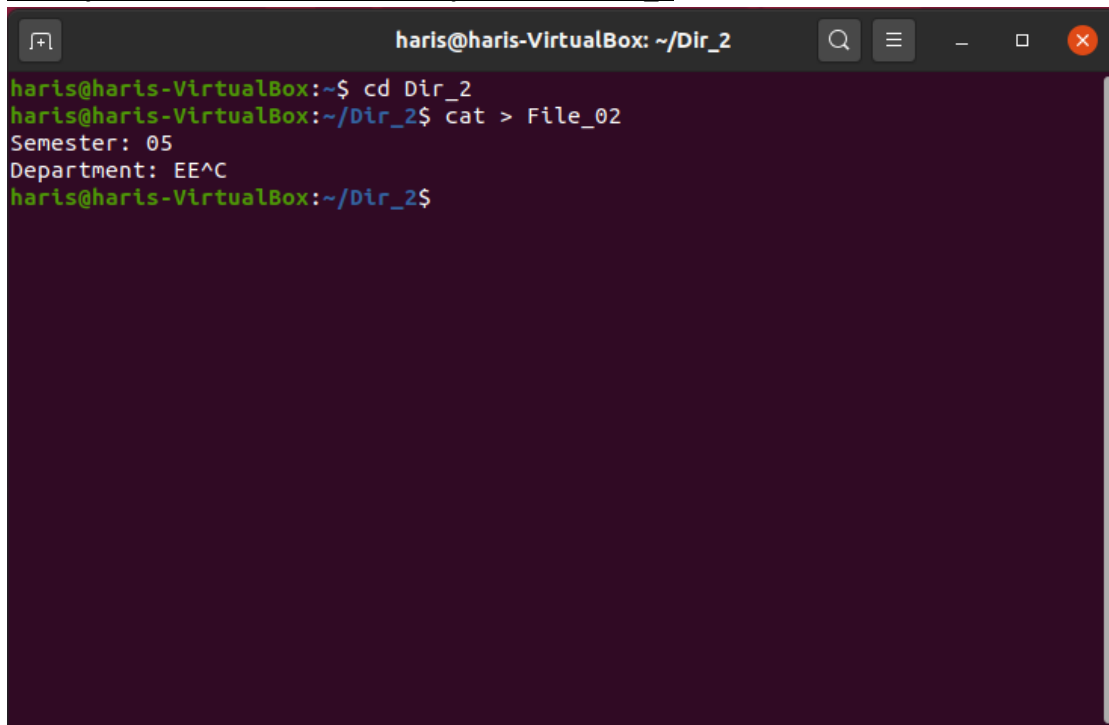
Terminal Examination

2. Write your name & Roll number in File\_1

A terminal window titled 'haris@haris-VirtualBox: ~/Dir\_1'. The prompt is 'haris@haris-VirtualBox:~/Dir\_1\$'. The user enters 'cat > File\_01', followed by 'NAME: Haris' and 'RollNO: FA18-BCE-090^C' on separate lines. The prompt returns to 'haris@haris-VirtualBox:~/Dir\_1\$' with a cursor.

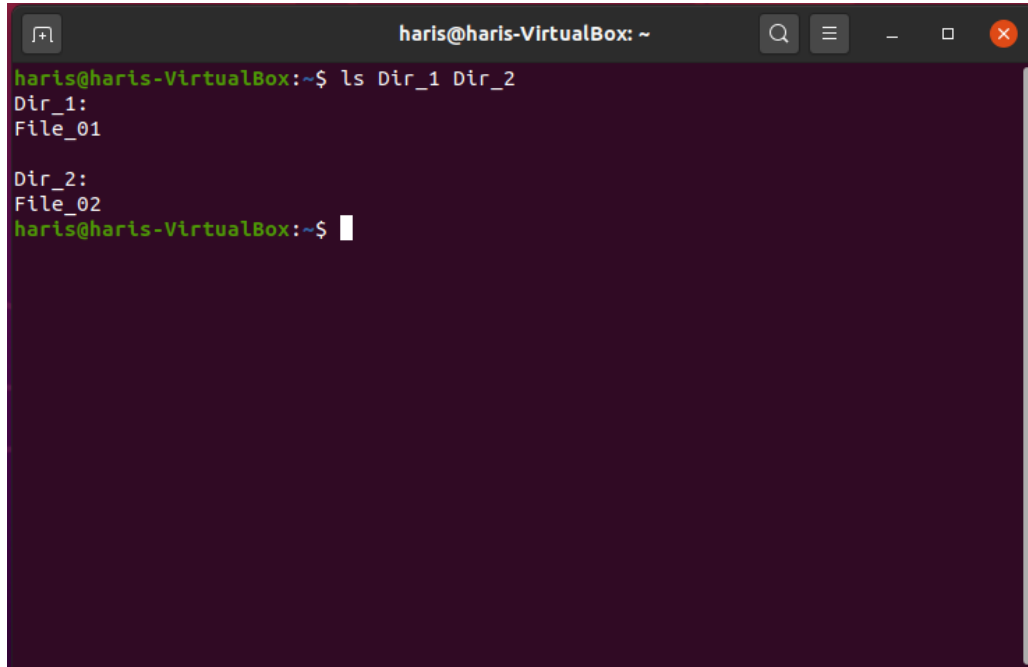
```
haris@haris-VirtualBox: ~/Dir_1
haris@haris-VirtualBox:~/Dir_1$ cat > File_01
NAME: Haris
RollNO: FA18-BCE-090^C
haris@haris-VirtualBox:~/Dir_1$
```

3. Write your semester number and department in File\_2

A terminal window titled 'haris@haris-VirtualBox: ~/Dir\_2'. The prompt is 'haris@haris-VirtualBox:~\$'. The user enters 'cd Dir\_2', then 'cat > File\_02', followed by 'Semester: 05' and 'Department: EE^C' on separate lines. The prompt returns to 'haris@haris-VirtualBox:~/Dir\_2\$' with a cursor.

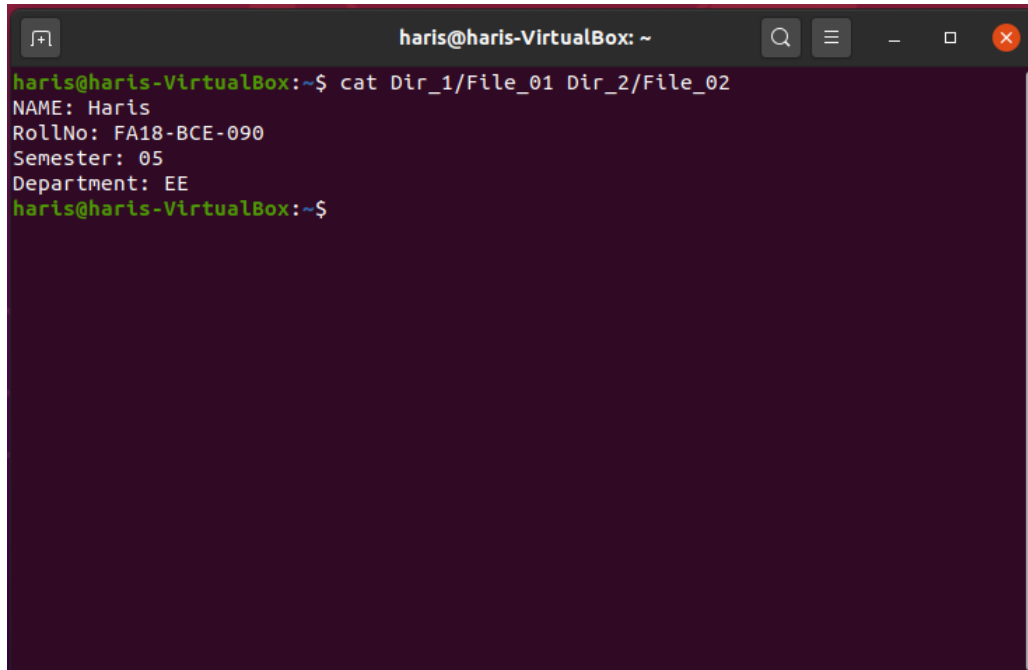
```
haris@haris-VirtualBox:~$ cd Dir_2
haris@haris-VirtualBox:~/Dir_2$ cat > File_02
Semester: 05
Department: EE^C
haris@haris-VirtualBox:~/Dir_2$
```

4. Stay in the main folder and list the contents of both Dir\_1 & Dir\_2



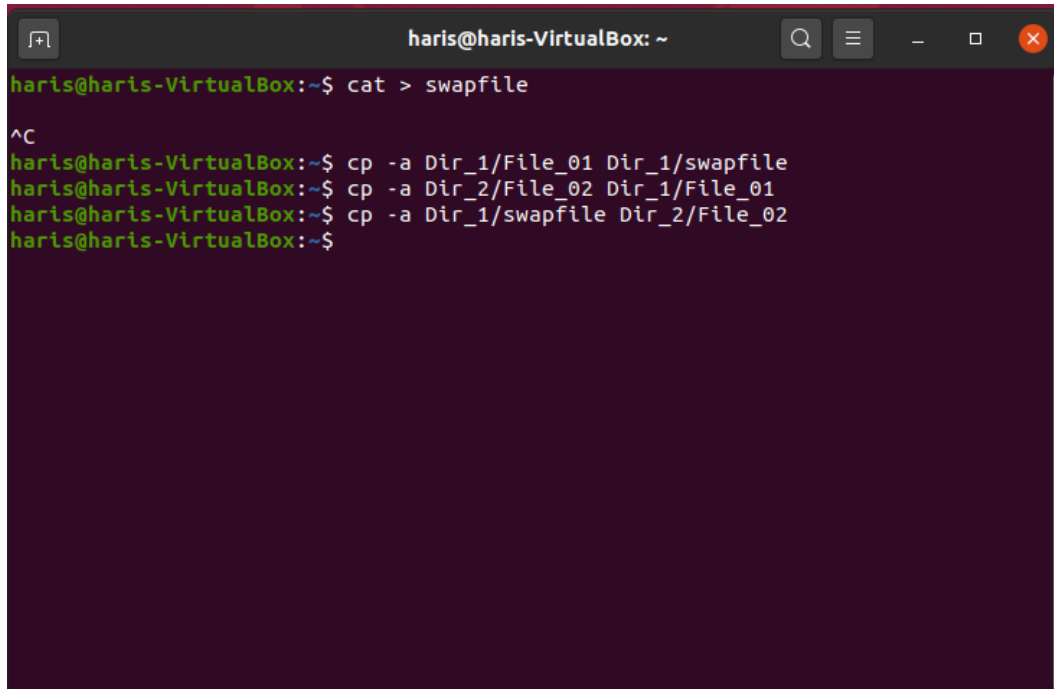
```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ ls Dir_1 Dir_2  
Dir_1:  
File_01  
  
Dir_2:  
File_02  
haris@haris-VirtualBox:~$
```

5. Print the contents of the File\_01 & File\_02



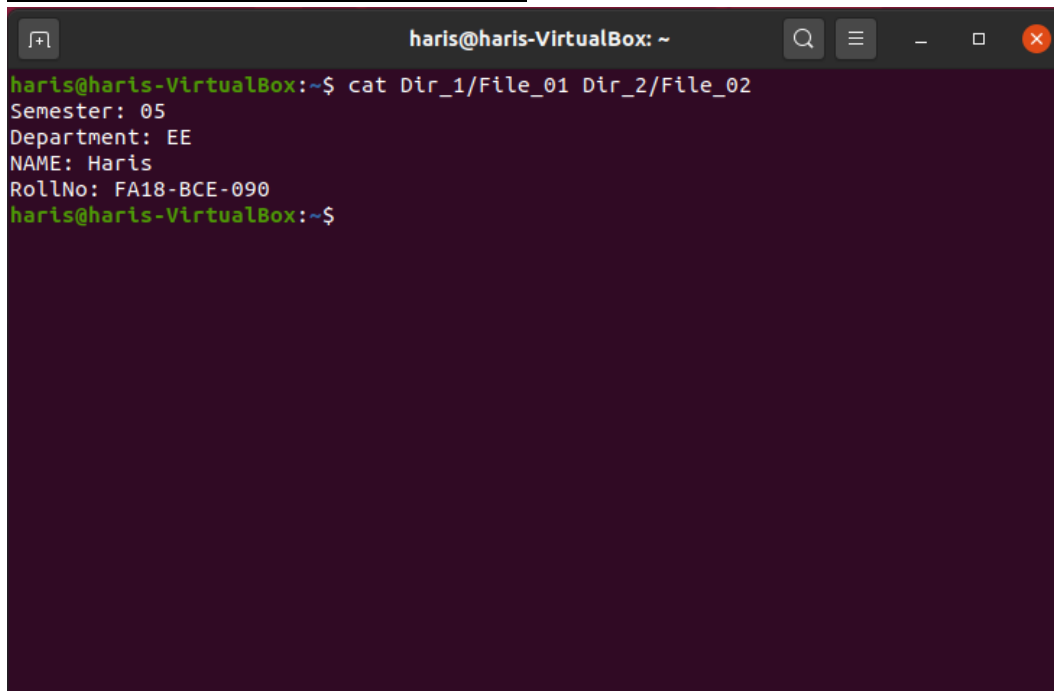
```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ cat Dir_1/File_01 Dir_2/File_02  
NAME: Haris  
RollNo: FA18-BCE-090  
Semester: 05  
Department: EE  
haris@haris-VirtualBox:~$
```

6. Swap the contents of File\_01 & File\_02

A terminal window titled 'haris@haris-VirtualBox: ~' with search, menu, and window control icons. The terminal shows a sequence of commands to swap the contents of two files. The first command 'cat > swapfile' is followed by a carriage return '^C'. Then three 'cp' commands are executed: copying 'Dir\_1/File\_01' to 'Dir\_1/swapfile', 'Dir\_2/File\_02' to 'Dir\_1/File\_01', and finally 'Dir\_1/swapfile' to 'Dir\_2/File\_02'.

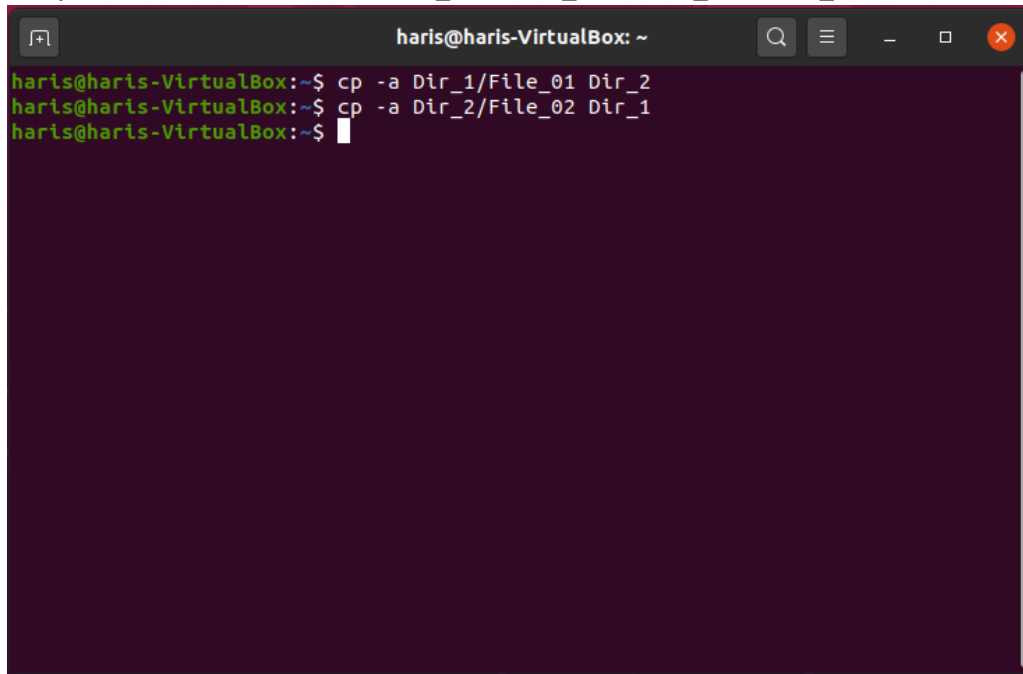
```
haris@haris-VirtualBox:~$ cat > swapfile
^C
haris@haris-VirtualBox:~$ cp -a Dir_1/File_01 Dir_1/swapfile
haris@haris-VirtualBox:~$ cp -a Dir_2/File_02 Dir_1/File_01
haris@haris-VirtualBox:~$ cp -a Dir_1/swapfile Dir_2/File_02
haris@haris-VirtualBox:~$
```

7. Print the contents of the File\_01 & File\_02

A terminal window titled 'haris@haris-VirtualBox: ~' with search, menu, and window control icons. The terminal shows the command 'cat Dir\_1/File\_01 Dir\_2/File\_02' being executed, which prints the contents of both files. The output consists of four lines: 'Semester: 05', 'Department: EE', 'NAME: Haris', and 'RollNo: FA18-BCE-090'.

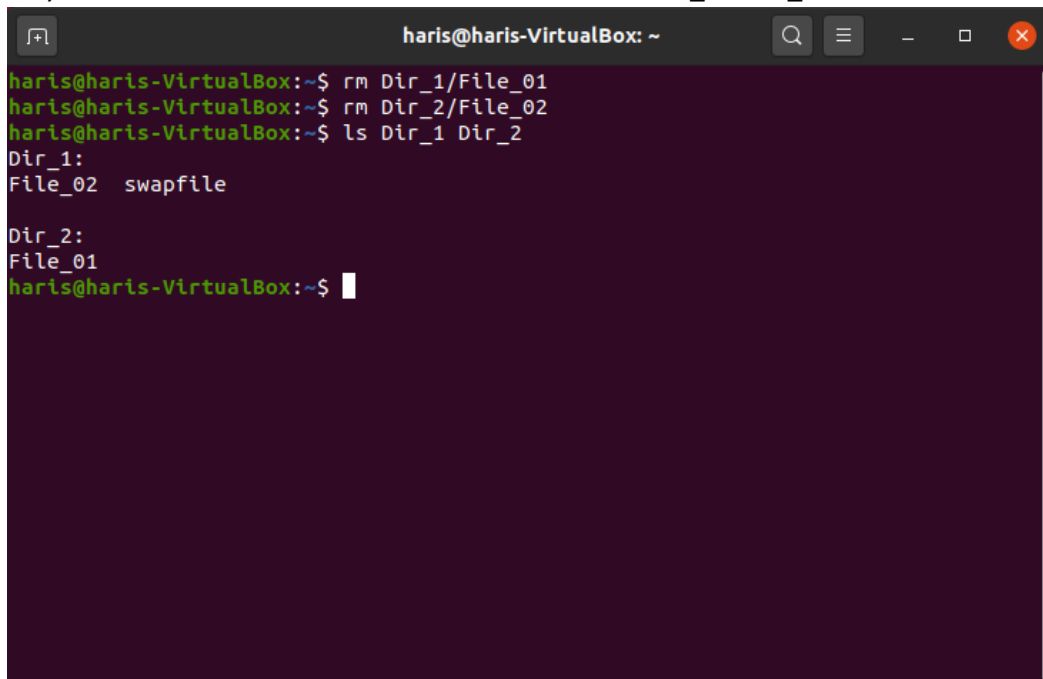
```
haris@haris-VirtualBox:~$ cat Dir_1/File_01 Dir_2/File_02
Semester: 05
Department: EE
NAME: Haris
RollNo: FA18-BCE-090
haris@haris-VirtualBox:~$
```

8. Swap the file directories (move File\_01 to Dir\_2 and File\_02 to Dir\_1)

A terminal window titled 'haris@haris-VirtualBox: ~' with search, menu, and window control icons. It shows three commands being executed: 'cp -a Dir\_1/File\_01 Dir\_2', 'cp -a Dir\_2/File\_02 Dir\_1', and a prompt for the next command.

```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ cp -a Dir_1/File_01 Dir_2  
haris@haris-VirtualBox:~$ cp -a Dir_2/File_02 Dir_1  
haris@haris-VirtualBox:~$
```

9. Stay in the main folder and list the contents of both Dir\_1 & Dir\_2

A terminal window titled 'haris@haris-VirtualBox: ~' with search, menu, and window control icons. It shows three commands: 'rm Dir\_1/File\_01', 'rm Dir\_2/File\_02', and 'ls Dir\_1 Dir\_2'. The output of the 'ls' command is displayed, showing 'File\_02 swapfile' for Dir\_1 and 'File\_01' for Dir\_2.

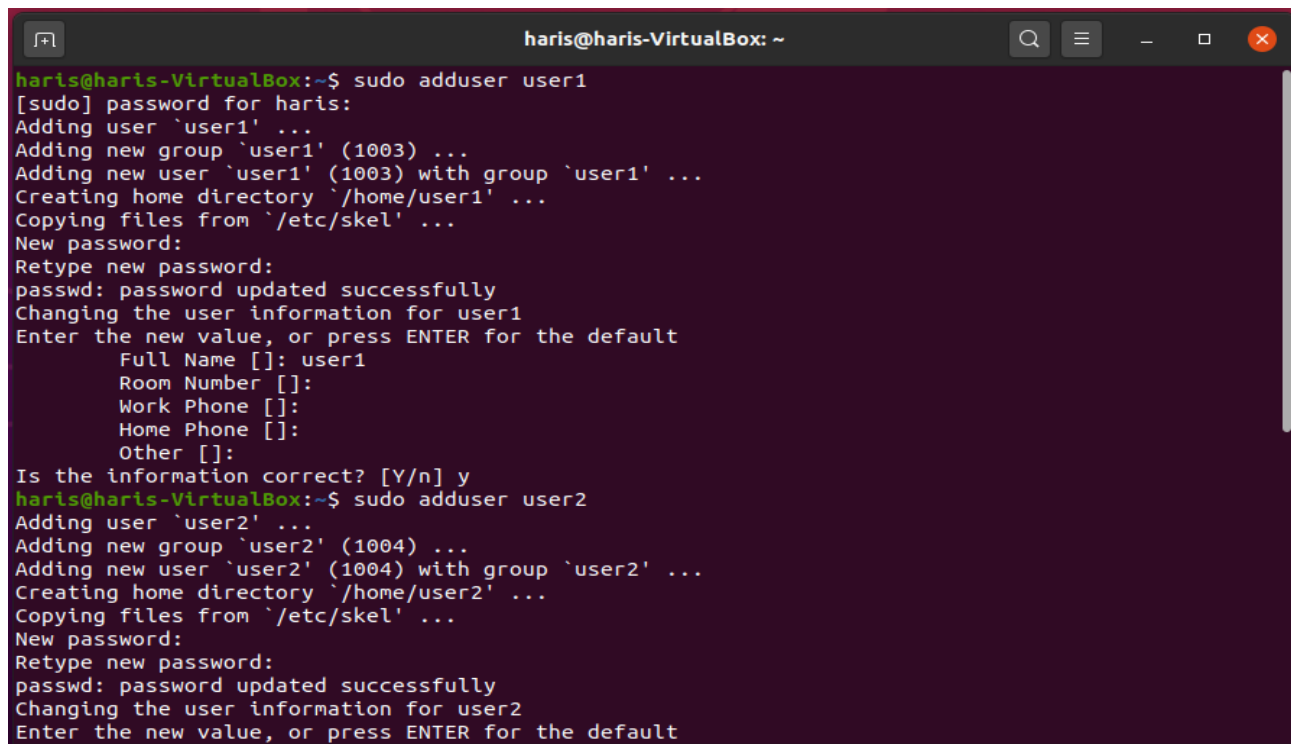
```
haris@haris-VirtualBox:~$ rm Dir_1/File_01  
haris@haris-VirtualBox:~$ rm Dir_2/File_02  
haris@haris-VirtualBox:~$ ls Dir_1 Dir_2  
Dir_1:  
File_02  swapfile  
  
Dir_2:  
File_01  
haris@haris-VirtualBox:~$
```

## Question 02

Familiar with adduser command using:

1. man adduser/useradd, man groupadd useradd - create a new user or update default new user information. Create 3 user accounts (user1, user2, user3) and add 2 groups (gr1, gr2). add user1 to gr1 and add user2, user2 to gr2. Check user ID (UID) and group ID (GID) by listing file /etc/passwd. Find cl user. What is the UID and GID for these accounts? Write command which show UID and GID for your username:

Below are pictures attached:



```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ sudo adduser user1  
[sudo] password for haris:  
Adding user `user1' ...  
Adding new group `user1' (1003) ...  
Adding new user `user1' (1003) with group `user1' ...  
Creating home directory `/home/user1' ...  
Copying files from `/etc/skel' ...  
New password:  
Retype new password:  
passwd: password updated successfully  
Changing the user information for user1  
Enter the new value, or press ENTER for the default  
    Full Name []: user1  
    Room Number []:  
    Work Phone []:  
    Home Phone []:  
    Other []:  
Is the information correct? [Y/n] y  
haris@haris-VirtualBox:~$ sudo adduser user2  
Adding user `user2' ...  
Adding new group `user2' (1004) ...  
Adding new user `user2' (1004) with group `user2' ...  
Creating home directory `/home/user2' ...  
Copying files from `/etc/skel' ...  
New password:  
Retype new password:  
passwd: password updated successfully  
Changing the user information for user2  
Enter the new value, or press ENTER for the default
```

```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ sudo adduser user2  
Adding user `user2' ...  
Adding new group `user2' (1004) ...  
Adding new user `user2' (1004) with group `user2' ...  
Creating home directory `/home/user2' ...  
Copying files from `/etc/skel' ...  
New password:  
Retype new password:  
passwd: password updated successfully  
Changing the user information for user2  
Enter the new value, or press ENTER for the default  
    Full Name []: user2  
    Room Number []:  
    Work Phone []:  
    Home Phone []:  
    Other []:  
Is the information correct? [Y/n] y  
haris@haris-VirtualBox:~$ sudo adduser user3  
Adding user `user3' ...  
Adding new group `user3' (1005) ...  
Adding new user `user3' (1005) with group `user3' ...  
Creating home directory `/home/user3' ...  
Copying files from `/etc/skel' ...  
New password:  
Retype new password:  
passwd: password updated successfully  
Changing the user information for user3  
Enter the new value, or press ENTER for the default  
    Full Name []: user3  
  
Adding new user `user3' (1005) with group `user3' ...  
Creating home directory `/home/user3' ...  
Copying files from `/etc/skel' ...  
New password:  
Retype new password:  
passwd: password updated successfully  
Changing the user information for user3  
Enter the new value, or press ENTER for the default  
    Full Name []: user3  
    Room Number []:  
    Work Phone []:  
    Home Phone []:  
    Other []:  
Is the information correct? [Y/n] y  
haris@haris-VirtualBox:~$ sudo groupadd grp1  
haris@haris-VirtualBox:~$ sudo groupadd grp2  
haris@haris-VirtualBox:~$ sudo adduser user1 grp1  
Adding user `user1' to group `grp1' ...  
Adding user user1 to group grp1  
Done.  
haris@haris-VirtualBox:~$ sudo adduser user2 grp2  
Adding user `user2' to group `grp2' ...  
Adding user user2 to group grp2  
Done.  
haris@haris-VirtualBox:~$ sudo adduser user3 grp2  
Adding user `user3' to group `grp2' ...  
Adding user user3 to group grp2  
Done.  
haris@haris-VirtualBox:~$
```



```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ sudo id user1  
uid=1003(user1) gid=1003(user1) groups=1003(user1),1006(grp1)  
haris@haris-VirtualBox:~$ sudo id user2  
uid=1004(user2) gid=1004(user2) groups=1004(user2),1007(grp2)  
haris@haris-VirtualBox:~$ sudo id user3  
uid=1005(user3) gid=1005(user3) groups=1005(user3),1007(grp2)  
haris@haris-VirtualBox:~$  
  
haris@haris-VirtualBox:~$ ls -l /etc/passwd  
-rw-r--r-- 1 root root 2975 14:11 3 جنوري /etc/passwd  
haris@haris-VirtualBox:~$ while IFS=: read -r f1 f2 f3 f4 f5 f6 f7  
> do  
> echo "User $f1 use $f7 shell and stores files in $f6 directory"  
> done < /etc/passwd  
User root use /bin/bash shell and stores files in /root directory  
User daemon use /usr/sbin/nologin shell and stores files in /usr/sbin directory  
User bin use /usr/sbin/nologin shell and stores files in /bin directory  
User sys use /usr/sbin/nologin shell and stores files in /dev directory  
User sync use /bin/sync shell and stores files in /bin directory  
User games use /usr/sbin/nologin shell and stores files in /usr/games directory  
User man use /usr/sbin/nologin shell and stores files in /var/cache/man directory  
User lp use /usr/sbin/nologin shell and stores files in /var/spool/lpd directory  
User mail use /usr/sbin/nologin shell and stores files in /var/mail directory  
User news use /usr/sbin/nologin shell and stores files in /var/spool/news directory  
User uucp use /usr/sbin/nologin shell and stores files in /var/spool/uucp directory  
User proxy use /usr/sbin/nologin shell and stores files in /bin directory  
User www-data use /usr/sbin/nologin shell and stores files in /var/www directory  
User backup use /usr/sbin/nologin shell and stores files in /var/backups directory  
User list use /usr/sbin/nologin shell and stores files in /var/list directory  
User irc use /usr/sbin/nologin shell and stores files in /var/run/ircd directory  
User gnats use /usr/sbin/nologin shell and stores files in /var/lib/gnats directory  
User nobody use /usr/sbin/nologin shell and stores files in /nonexistent directory  
User systemd-network use /usr/sbin/nologin shell and stores files in /run/systemd directory  
User systemd-resolve use /usr/sbin/nologin shell and stores files in /run/systemd directory  
User systemd-timesync use /usr/sbin/nologin shell and stores files in /run/systemd directory  
User messagebus use /usr/sbin/nologin shell and stores files in /nonexistent directory  
User syslog use /usr/sbin/nologin shell and stores files in /home/syslog directory  
User _apt use /usr/sbin/nologin shell and stores files in /nonexistent directory  
User tss use /bin/false shell and stores files in /var/lib/tpm directory  
User uidd use /usr/sbin/nologin shell and stores files in /run/uidd directory  
User tcpdump use /usr/sbin/nologin shell and stores files in /nonexistent directory  
User avahi-autoipd use /usr/sbin/nologin shell and stores files in /var/lib/avahi-autoipd directory  
User usbmux use /usr/sbin/nologin shell and stores files in /var/lib/usbmux directory  
User rtkit use /usr/sbin/nologin shell and stores files in /proc directory
```

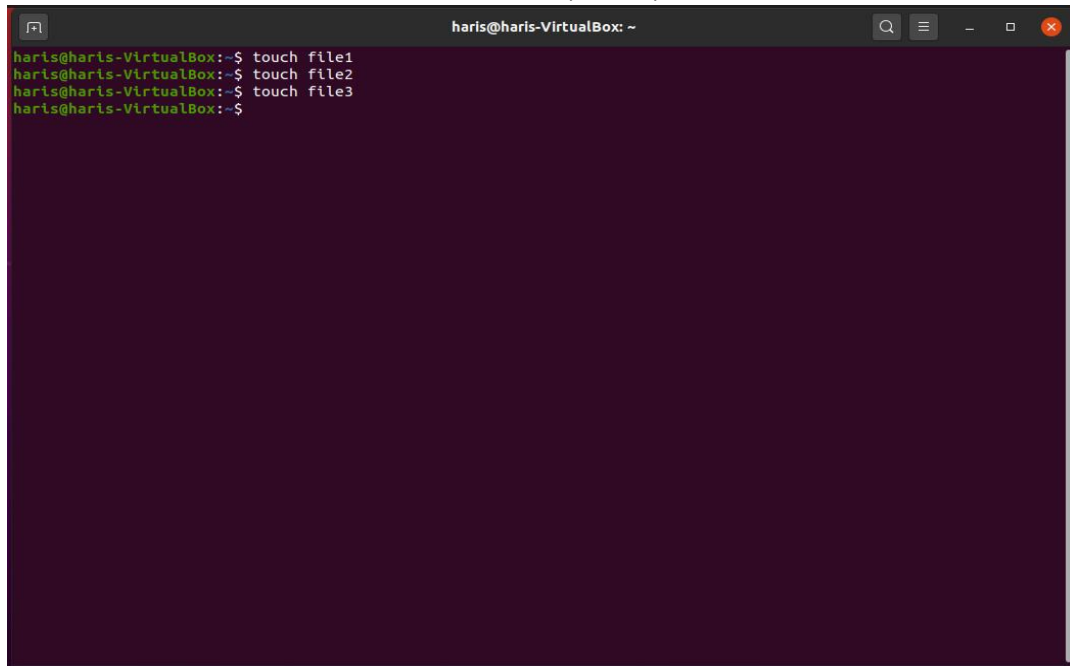
```

haris@haris-VirtualBox: ~
User gnats use /usr/sbin/nologin shell and stores files in /var/lib/gnats directory
User nobody use /usr/sbin/nologin shell and stores files in /nonexistent directory
User systemd-network use /usr/sbin/nologin shell and stores files in /run/systemd directory
User systemd-resolve use /usr/sbin/nologin shell and stores files in /run/systemd directory
User systemd-timesync use /usr/sbin/nologin shell and stores files in /run/systemd directory
User messagebus use /usr/sbin/nologin shell and stores files in /nonexistent directory
User syslog use /usr/sbin/nologin shell and stores files in /home/syslog directory
User _apt use /usr/sbin/nologin shell and stores files in /nonexistent directory
User tss use /bin/false shell and stores files in /var/lib/tpm directory
User uidd use /usr/sbin/nologin shell and stores files in /run/uidd directory
User tcpdump use /usr/sbin/nologin shell and stores files in /nonexistent directory
User avahi-autoipd use /usr/sbin/nologin shell and stores files in /var/lib/avahi-autoipd directory
User usbmux use /usr/sbin/nologin shell and stores files in /var/lib/usbmux directory
User rtkit use /usr/sbin/nologin shell and stores files in /proc directory
User dnsmasq use /usr/sbin/nologin shell and stores files in /var/lib/misc directory
User cups-pk-helper use /usr/sbin/nologin shell and stores files in /home/cups-pk-helper directory
User speech-dispatcher use /bin/false shell and stores files in /run/speech-dispatcher directory
User avahi use /usr/sbin/nologin shell and stores files in /var/run/avahi-daemon directory
User kernoops use /usr/sbin/nologin shell and stores files in / directory
User saned use /usr/sbin/nologin shell and stores files in /var/lib/saned directory
User nm-openvpn use /usr/sbin/nologin shell and stores files in /var/lib/openvpn/chroot directory
User hplip use /bin/false shell and stores files in /run/hplip directory
User whoopsie use /bin/false shell and stores files in /nonexistent directory
User colord use /usr/sbin/nologin shell and stores files in /var/lib/colord directory
User geoclue use /usr/sbin/nologin shell and stores files in /var/lib/geoclue directory
User pulse use /usr/sbin/nologin shell and stores files in /var/run/pulse directory
User gnome-initial-setup use /bin/false shell and stores files in /run/gnome-initial-setup/ directory
User gdm use /bin/false shell and stores files in /var/lib/gdm3 directory
User haris use /bin/bash shell and stores files in /home/haris directory
User systemd-coredump use /usr/sbin/nologin shell and stores files in / directory
User usama use /bin/bash shell and stores files in /home/usama directory
User faisal use /bin/bash shell and stores files in /home/faisal directory
User user1 use /bin/bash shell and stores files in /home/user1 directory
User user2 use /bin/bash shell and stores files in /home/user2 directory
User user3 use /bin/bash shell and stores files in /home/user3 directory
haris@haris-VirtualBox:~$

haris@haris-VirtualBox: /home
haris@haris-VirtualBox:/home$ ls
faisal haris usama user1 user2 user3
haris@haris-VirtualBox:/home$ ls -n
total 24
drwxr-xr-x 15 1002 1002 4096 20:45 18 ڤسمبر faisal
drwxr-xr-x 20 1000 1000 4096 13:56 3 ڤنوري haris
drwxr-xr-x 2 1001 1001 4096 19:58 5 نومبر usama
drwxr-xr-x 2 1003 1003 4096 14:11 3 ڤنوري user1
drwxr-xr-x 2 1004 1004 4096 14:11 3 ڤنوري user2
drwxr-xr-x 2 1005 1005 4096 14:11 3 ڤنوري user3
haris@haris-VirtualBox:/home$ sudo id
uid=0(root) gid=0(root) groups=0(root)
haris@haris-VirtualBox:/home$ sudo id user1
uid=1003(user1) gid=1003(user1) groups=1003(user1),1006(grp1)
haris@haris-VirtualBox:/home$

```

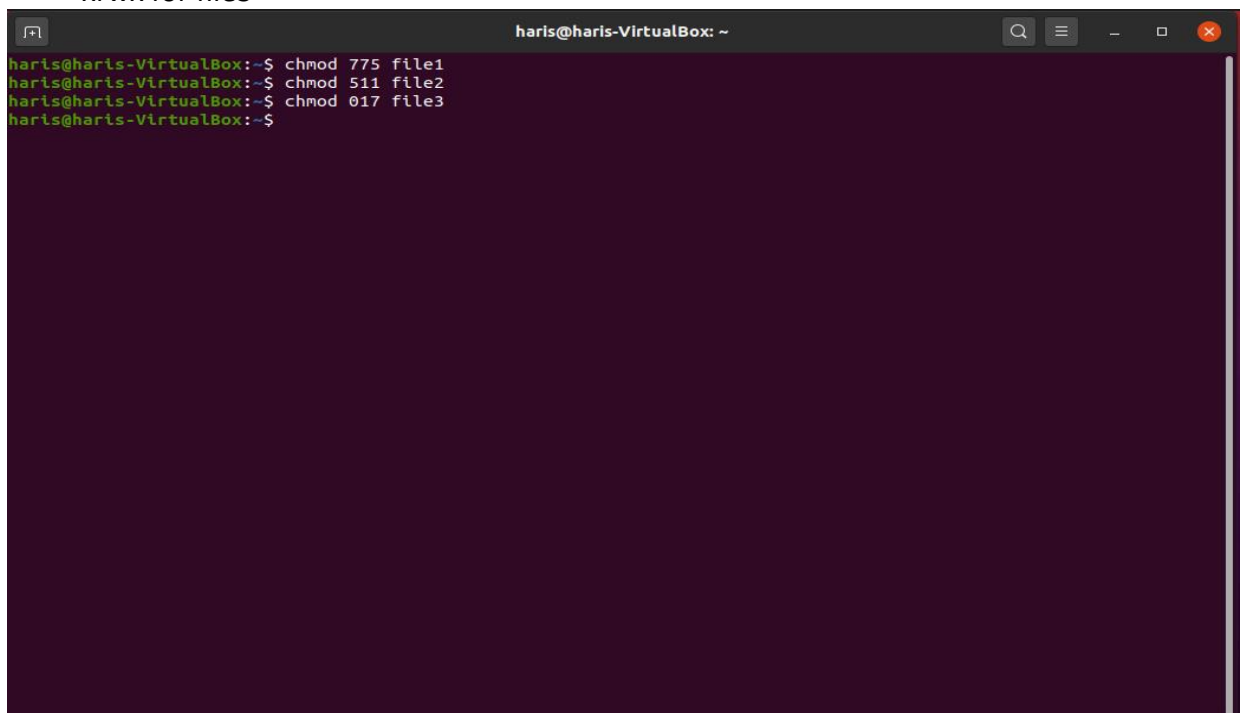
2. create 3 files with touch command: file1, file2, file3.



```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ touch file1  
haris@haris-VirtualBox:~$ touch file2  
haris@haris-VirtualBox:~$ touch file3  
haris@haris-VirtualBox:~$
```

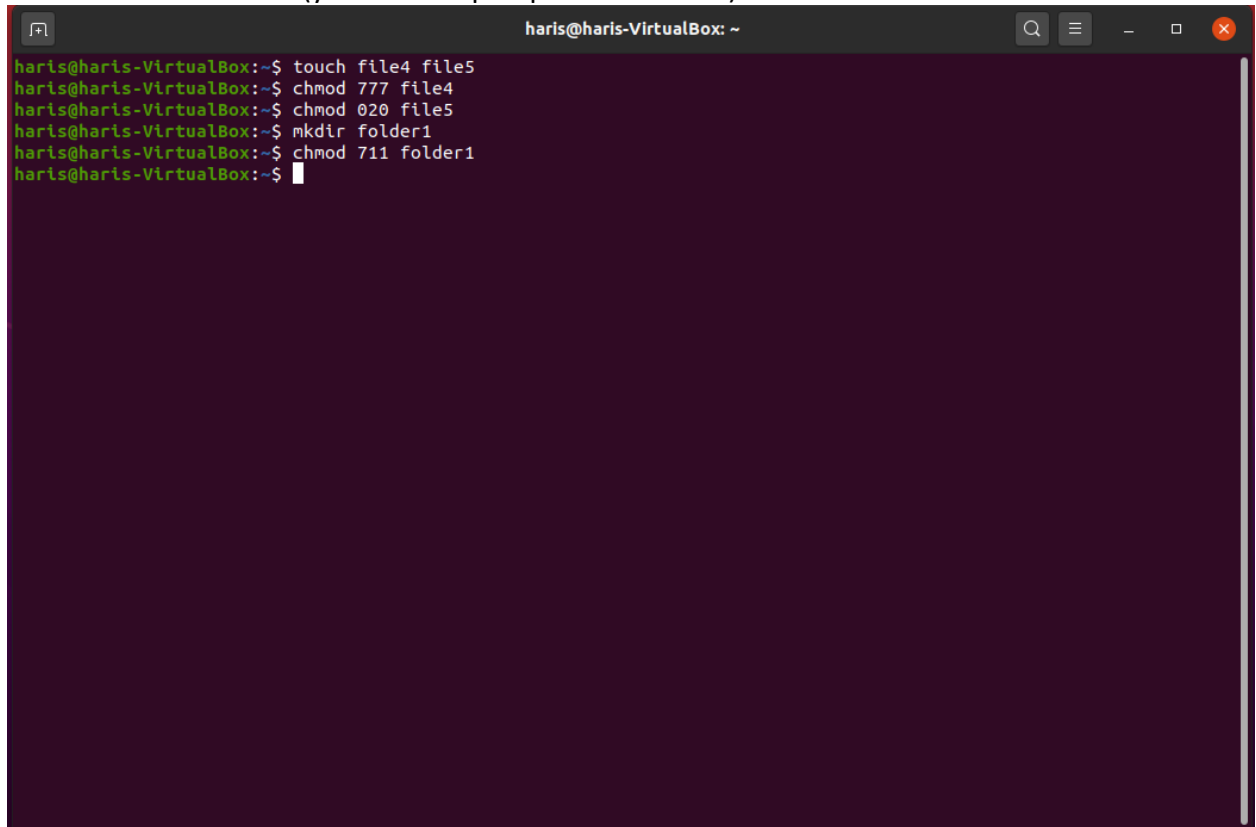
3. Write the command line by using letters with chmod to set the following permissions:

- rwxrwxr-x for file1
- r-x—x—x for file2
- ——xrw— for file3



```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ chmod 775 file1  
haris@haris-VirtualBox:~$ chmod 511 file2  
haris@haris-VirtualBox:~$ chmod 017 file3  
haris@haris-VirtualBox:~$
```

4. Write the command line by using numbers with chmod to set the following permissions:
- rwxrwxrwx for file4 (you have to prepare this file)
  - -w----- for file5 (you have to prepare this file)
  - rwx--x—x for folder1 (you have to prepare this folder)

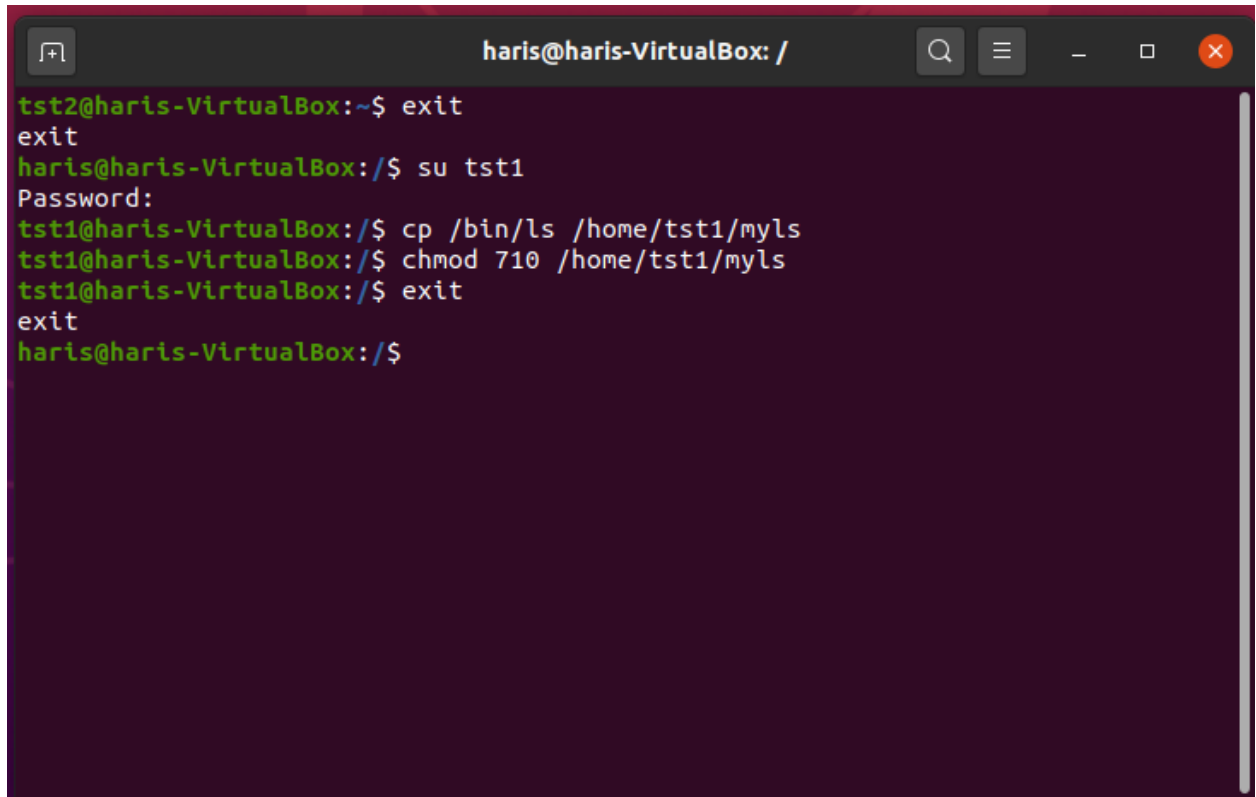


```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ touch file4 file5  
haris@haris-VirtualBox:~$ chmod 777 file4  
haris@haris-VirtualBox:~$ chmod 020 file5  
haris@haris-VirtualBox:~$ mkdir folder1  
haris@haris-VirtualBox:~$ chmod 711 folder1  
haris@haris-VirtualBox:~$
```

5. Create two user accounts: tst1 and tst2 Logging in id: tst1, group users, with bash shell, home directory /home/tst1 Logging in id: tst2, group public, with bash shell, home directory home/tst2 For the two accounts set a password.

```
haris@haris-VirtualBox:~$ sudo adduser tst1
Adding user `tst1' ...
Adding new group `tst1' (1008) ...
Adding new user `tst1' (1006) with group `tst1' ...
Creating home directory `/home/tst1' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for tst1
Enter the new value, or press ENTER for the default
    Full Name []: tst1
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] y
haris@haris-VirtualBox:~$ sudo adduser tst2
Adding user `tst2' ...
Adding new group `tst2' (1009) ...
Adding new user `tst2' (1007) with group `tst2' ...
Creating home directory `/home/tst2' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for tst2
Enter the new value, or press ENTER for the default
    Full Name []: tst2
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] Y
haris@haris-VirtualBox:~$
```

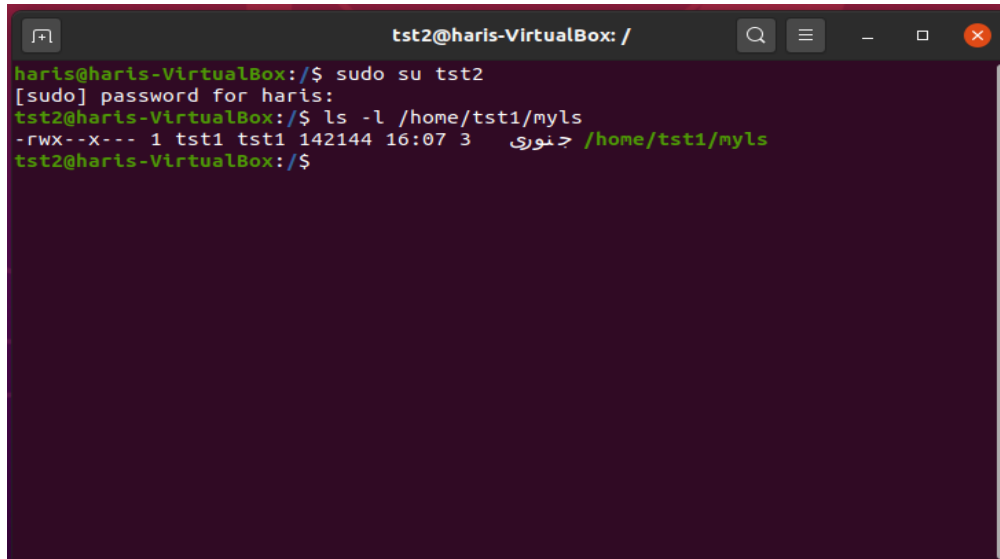
6. Logging in as tst1 and copy /bin/ls into tst1 home directory as mcpyls file. Change the owner of myls to tst1 and the permissions to 0710. What does this permission value mean?



```
haris@haris-VirtualBox: /
tst2@haris-VirtualBox:~$ exit
exit
haris@haris-VirtualBox:/$ su tst1
Password:
tst1@haris-VirtualBox:/$ cp /bin/ls /home/tst1/myls
tst1@haris-VirtualBox:/$ chmod 710 /home/tst1/myls
tst1@haris-VirtualBox:/$ exit
exit
haris@haris-VirtualBox:/$
```

7. Logging in as tst2 and try to use /home/tst1/myls to list your current directory. Does it work ?

Clclec

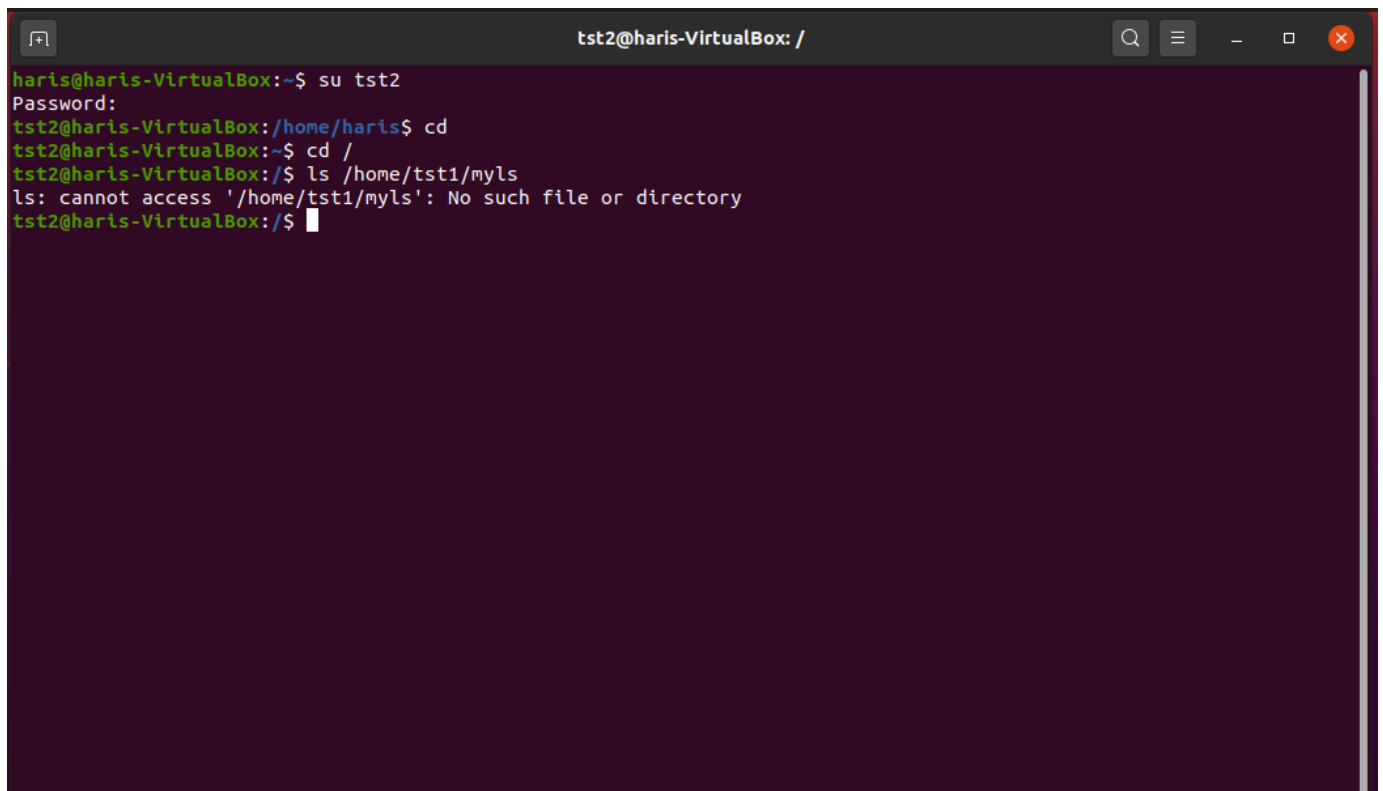


```
tst2@haris-VirtualBox: /  
haris@haris-VirtualBox:/$ sudo su tst2  
[sudo] password for haris:  
tst2@haris-VirtualBox:/$ ls -l /home/tst1/myls  
-rwx--x--- 1 tst1 tst1 142144 16:07 3 جنوري /home/tst1/myls  
tst2@haris-VirtualBox:/$
```

8. Create a new group labo with tst1 and tst2. Change the owner group of myls file to labo. Try again from tst2 account to execute /home/tst1/myls to list your current directory. Does

It

work?

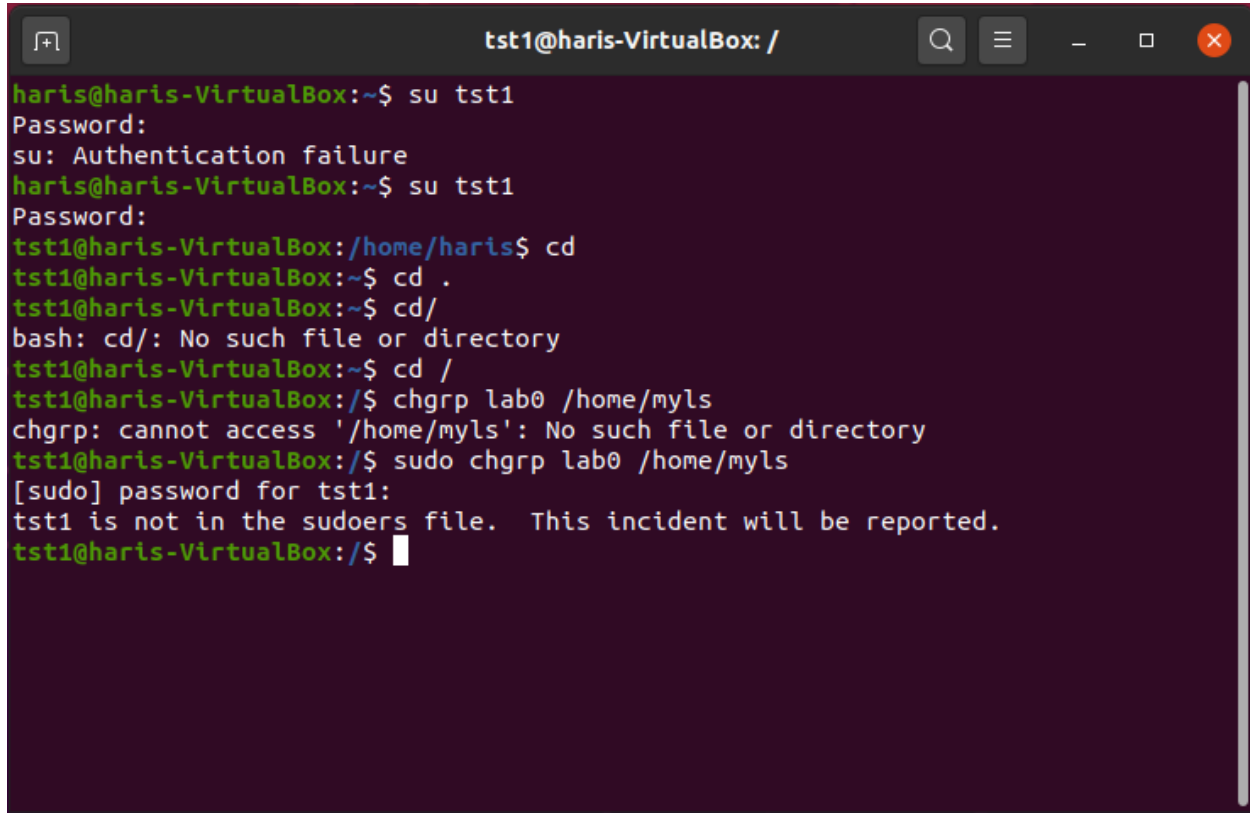


```
tst2@haris-VirtualBox: /  
haris@haris-VirtualBox:~$ su tst2  
Password:  
tst2@haris-VirtualBox:/home/haris$ cd  
tst2@haris-VirtualBox:~$ cd /  
tst2@haris-VirtualBox:/$ ls /home/tst1/myls  
ls: cannot access '/home/tst1/myls': No such file or directory  
tst2@haris-VirtualBox:/$
```

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Terminal Examination

A terminal window titled 'tst1@haris-VirtualBox: /' with standard window controls. The terminal shows a user 'haris' attempting to switch to 'tst1' using 'su'. The first attempt fails due to authentication. The second attempt succeeds, and the prompt changes to 'tst1@haris-VirtualBox:/home/haris\$'. The user then runs 'cd', 'cd /', and 'chgrp lab0 /home/myls'. The 'chgrp' command fails with the message 'chgrp: cannot access '/home/myls': No such file or directory'. Finally, the user runs 'sudo chgrp lab0 /home/myls', which prompts for a password and then displays the error 'tst1 is not in the sudoers file. This incident will be reported.' before returning to the root prompt 'tst1@haris-VirtualBox:/#'.

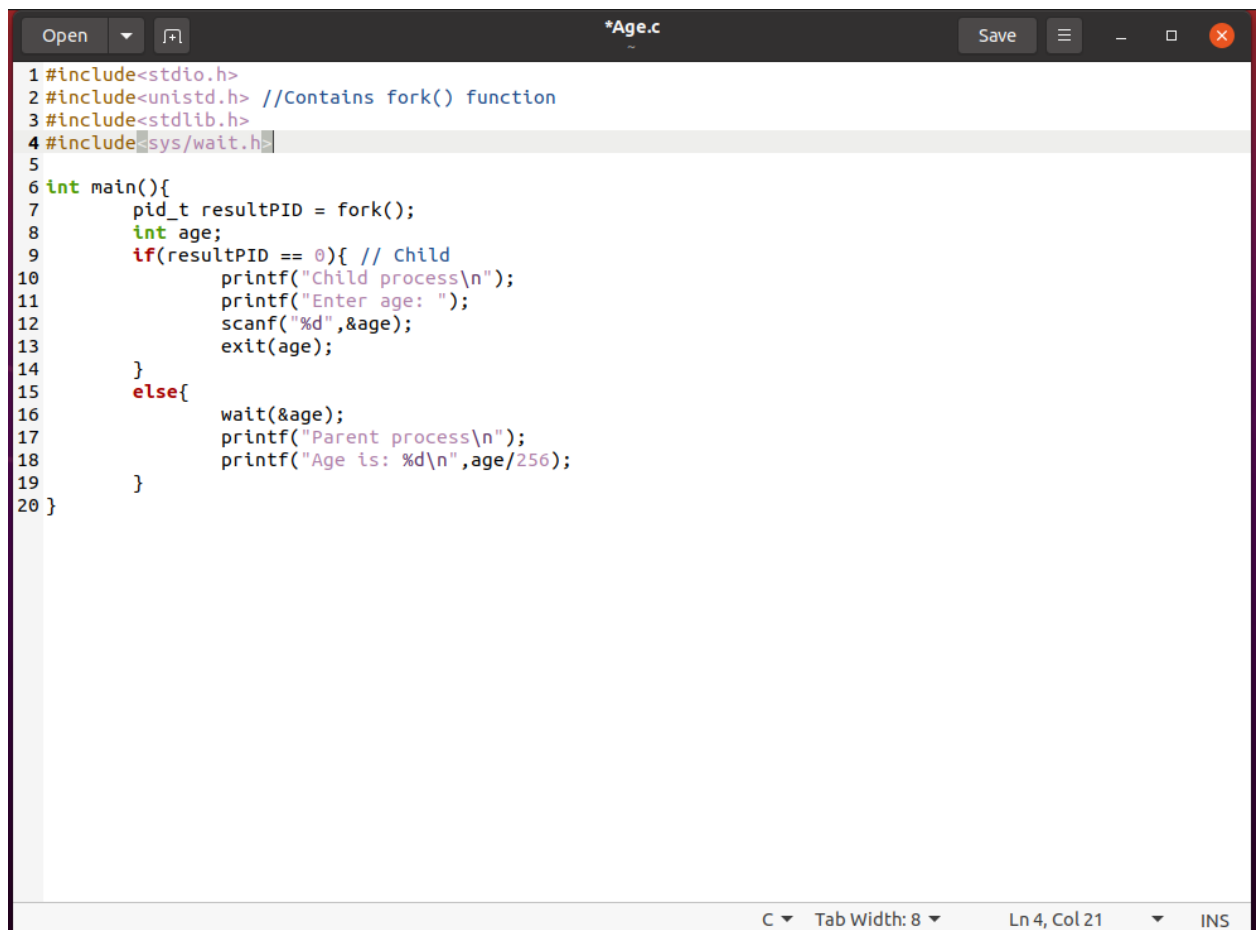
```
tst1@haris-VirtualBox: /
haris@haris-VirtualBox:~$ su tst1
Password:
su: Authentication failure
haris@haris-VirtualBox:~$ su tst1
Password:
tst1@haris-VirtualBox:/home/haris$ cd
tst1@haris-VirtualBox:~$ cd .
tst1@haris-VirtualBox:~$ cd /
bash: cd/: No such file or directory
tst1@haris-VirtualBox:~$ cd /
tst1@haris-VirtualBox:/$ chgrp lab0 /home/myls
chgrp: cannot access '/home/myls': No such file or directory
tst1@haris-VirtualBox:/$ sudo chgrp lab0 /home/myls
[sudo] password for tst1:
tst1 is not in the sudoers file. This incident will be reported.
tst1@haris-VirtualBox:/#
```

---



### Question 03

1. Write a C/C++ program in which a parent process creates a child process using a fork() system call. The child process takes your age as input and parent process prints the age.



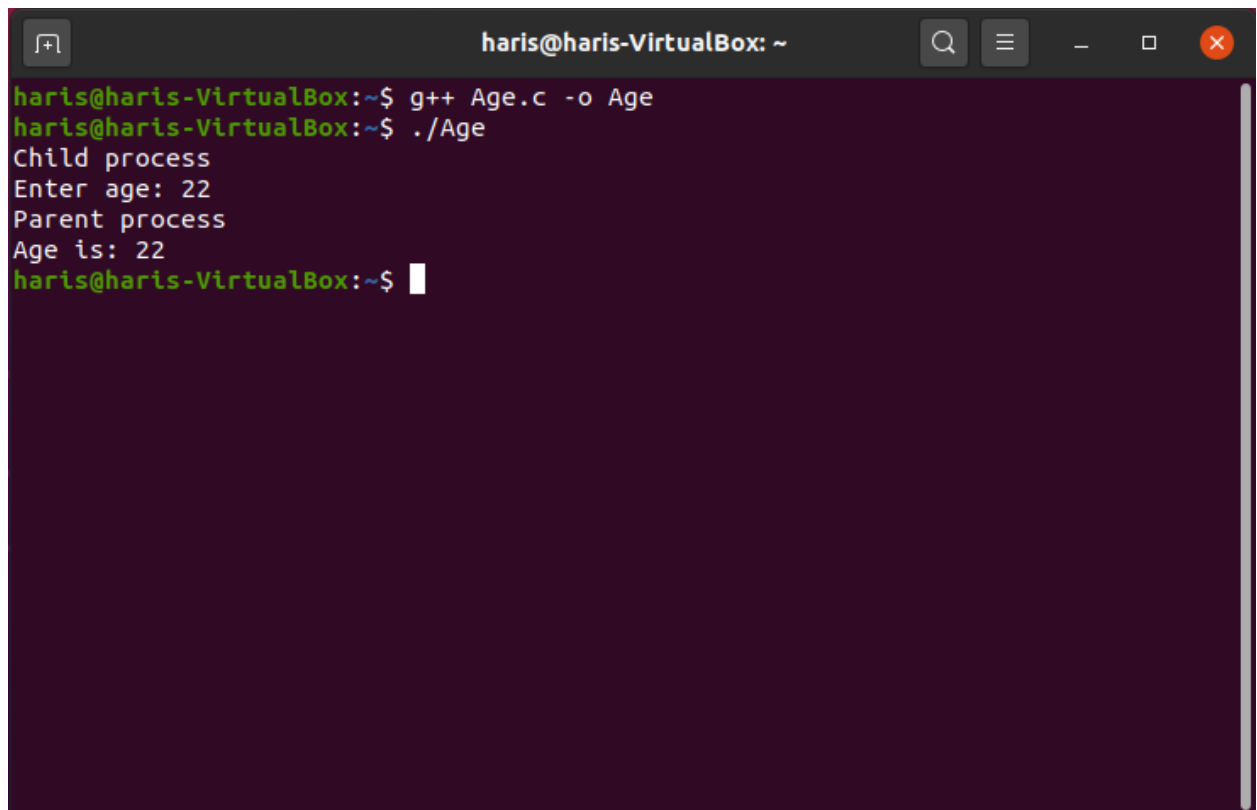
```
1 #include<stdio.h>
2 #include<unistd.h> //Contains fork() function
3 #include<stdlib.h>
4 #include<sys/wait.h>
5
6 int main(){
7     pid_t resultPID = fork();
8     int age;
9     if(resultPID == 0){ // Child
10         printf("Child process\n");
11         printf("Enter age: ");
12         scanf("%d",&age);
13         exit(age);
14     }
15     else{
16         wait(&age);
17         printf("Parent process\n");
18         printf("Age is: %d\n",age/256);
19     }
20 }
```

The screenshot shows a code editor window titled '\*Age.c'. The code is a C program that demonstrates process creation and management. It includes headers for standard I/O, unistd (for fork), stdlib, and sys/wait. The main function calls fork() to create a child process. If the call is successful (returns 0), the child process prints a message, prompts for age, reads it, and exits. The parent process then calls wait() to wait for the child to finish, prints a message, and prints the age divided by 256. The editor interface includes an 'Open' button, a 'Save' button, and a status bar at the bottom showing 'C', 'Tab Width: 8', 'Ln 4, Col 21', and 'INS'.

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Terminal Examination



```
haris@haris-VirtualBox: ~  
haris@haris-VirtualBox:~$ g++ Age.c -o Age  
haris@haris-VirtualBox:~$ ./Age  
Child process  
Enter age: 22  
Parent process  
Age is: 22  
haris@haris-VirtualBox:~$
```

The image shows a terminal window titled "haris@haris-VirtualBox: ~". The user has compiled a C++ program "Age.c" into an executable "Age" using the command "g++ Age.c -o Age". They then executed the program with "./Age". The program's output shows it is a "Child process", prompts for "Enter age: 22", and then reports "Age is: 22" from the "Parent process". The terminal window has a dark purple background and standard window controls at the top.

2. Write a C/C++ program that asks user to enter his name and his university name. Within the same program, execute another program that asks the user to enter his degree name and department name.

**Hint:** write 2 separate programs and execute using `execv()`



```
task51.c
~/Documents/C++

1 #include <stdio.h>
2 #include <unistd.h>
3 #include <sys/wait.h>
4 #include <stdlib.h>
5 int main()
6 {
7
8     char name [50];
9     char uni_name [50];
10
11
12     printf("Enter your name?\n");
13     scanf("%s", name);
14
15     printf("Enter your University name?\n");
16     scanf("%s", uni_name);
17
18     char *args[]={"task52", "C", "Programming", NULL};
19     execv("./task52", args);
20
21     return 0;
22 }
23
```

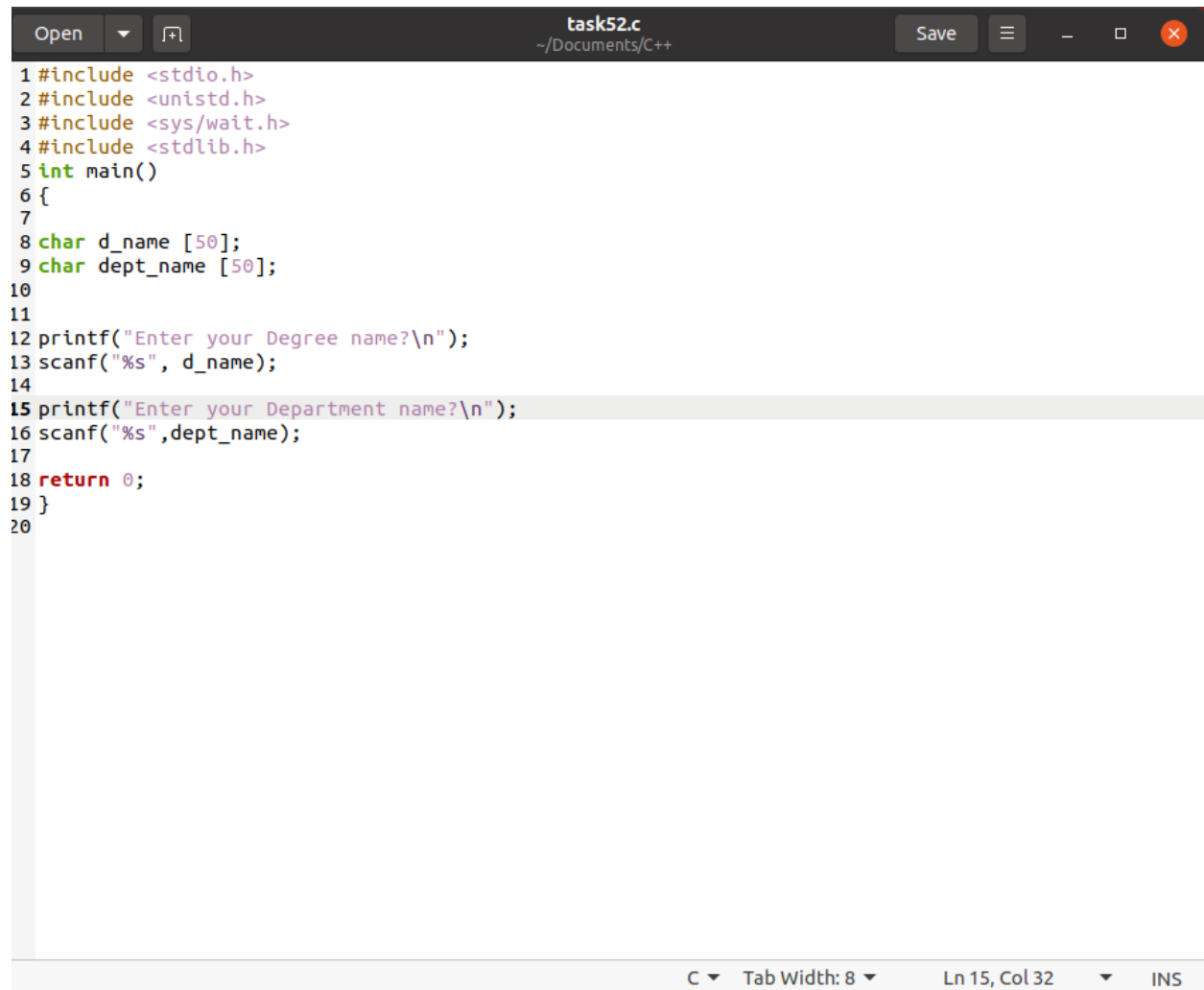
C Tab Width: 8 Ln 19, Col 25 INS

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Terminal Examination

x



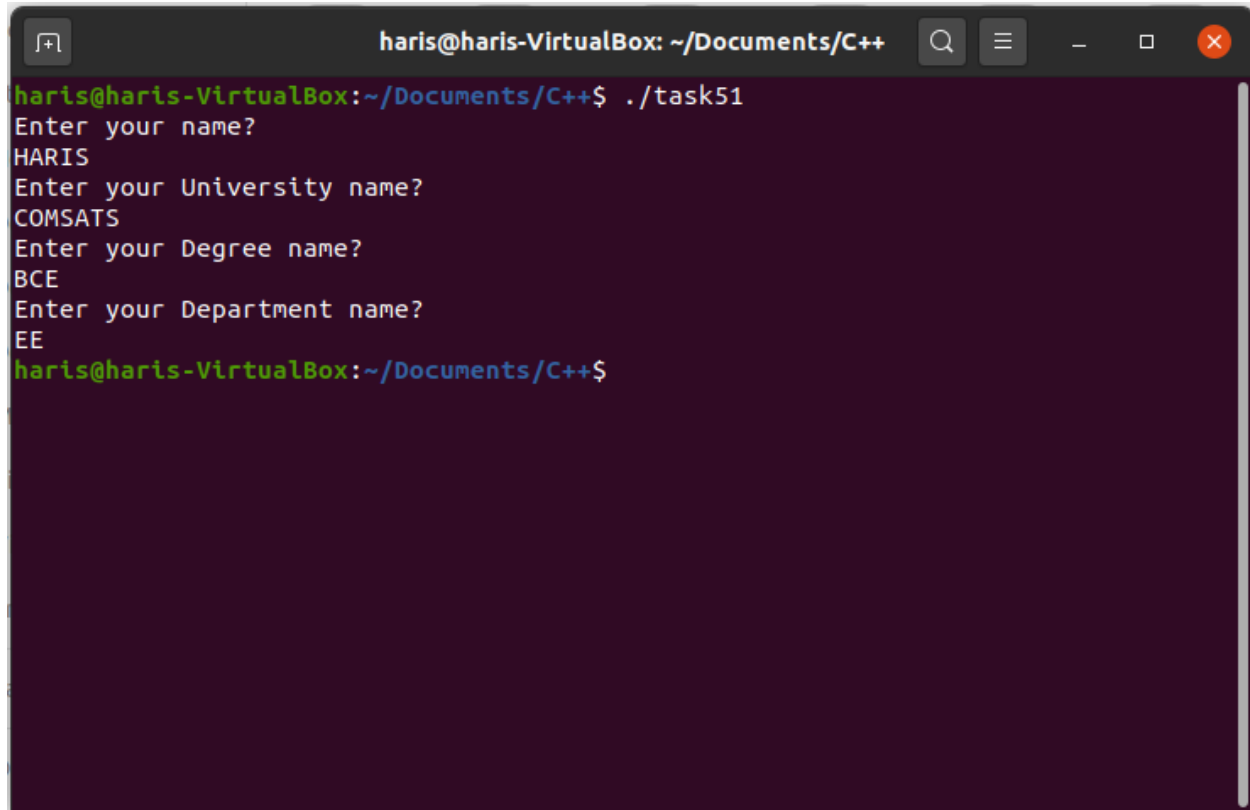
```
1 #include <stdio.h>
2 #include <unistd.h>
3 #include <sys/wait.h>
4 #include <stdlib.h>
5 int main()
6 {
7
8     char d_name [50];
9     char dept_name [50];
10
11
12     printf("Enter your Degree name?\n");
13     scanf("%s", d_name);
14
15     printf("Enter your Department name?\n");
16     scanf("%s", dept_name);
17
18     return 0;
19 }
20
```

The screenshot shows a code editor window with a dark title bar containing the filename 'task52.c' and the path '~/Documents/C++'. The editor has a menu bar with 'Open', 'Save', and a hamburger menu icon. The code is written in C++ with syntax highlighting. The status bar at the bottom indicates 'C', 'Tab Width: 8', 'Ln 15, Col 32', and 'INS'.

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Operating Systems Lab

Terminal Examination

A terminal window titled 'haris@haris-VirtualBox: ~/Documents/C++' with standard window controls. The terminal shows a C++ program being executed with the command './task51'. The program prompts for a name, university name, degree name, and department name, with the user providing 'HARIS', 'COMSATS', 'BCE', and 'EE' respectively. The prompt returns to the shell.

```
haris@haris-VirtualBox: ~/Documents/C++$ ./task51
Enter your name?
HARIS
Enter your University name?
COMSATS
Enter your Degree name?
BCE
Enter your Department name?
EE
haris@haris-VirtualBox: ~/Documents/C++$
```

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**THE END**