

**Vivekananda Institute of Professional Studies - Technical Campus**

**(Affiliated to GGSIP University, Delhi, Recognized by AICTE)**

**Vivekananda School of Information Technology**



**MASTERS OF COMPUTER APPLICATIONS  
2023-2025**

**MCA - 163**

**PRACTICAL FILE**

**OF**

**Operating System with Linux**

**Submitted To:  
Dr. Neetu Goel  
Assistant Professor  
VSIT, VIPS**

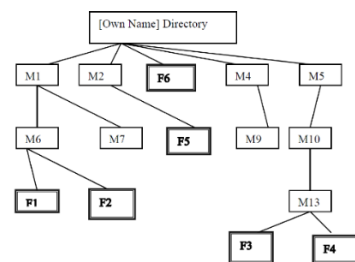
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13017704423  
MCA 1C**

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| 16   | Write the shell script to calculate average & percentage of marks entered by user.                                |      |          |      |

|           |   |  |  |  |
|-----------|---|--|--|--|
| <b>17</b> | Write a shell script to accept 3 numbers from user and find the largest among them.   |  |  |  |
| <b>18</b> | Write a shell script to print if the number is odd or even accepted from user.  |  |  |  |
| <b>19</b> | Write a shell script that computes the gross salary of a employee according To the following rules<br>if basic salary is < 1500 then<br>HRA=10% of the basic salary and<br>DA=90% of basic<br>if basic salary is >=1500 then HRA=Rs 500 and DA=98% of basic The basic salary is accepted from user. |  |  |  |
| <b>20</b> | Write a shell script to calculate the grade of student. Take 5 subjects into consideration.<br>Grade "O" if >= 90%<br>Grade "A" if >= 75% but less than 90%<br>Grade "B" if >= 60% but less than 75%<br>Grade "D" if >= 50% but less than 60% Grade "E" if < 50%.                                   |  |  |  |
| <b>21</b> | WAP to print Parent and Child process id in c and run it in linux.  |  |  |  |
| <b>22</b> | WAP to create a process and check whether the process is created or not using if else statements  |  |  |  |
| <b>23</b> | WAP a nested process using fork() command.  |  |  |  |
| <b>24</b> | WAP factorial of a number.  |  |  |  |
| <b>25</b> | WAP sum of first 10 natural numbers.  |  |  |  |
| <b>26</b> | WAP sum of first 10 input value.  |  |  |  |

## 1 Create the following new Directory structure

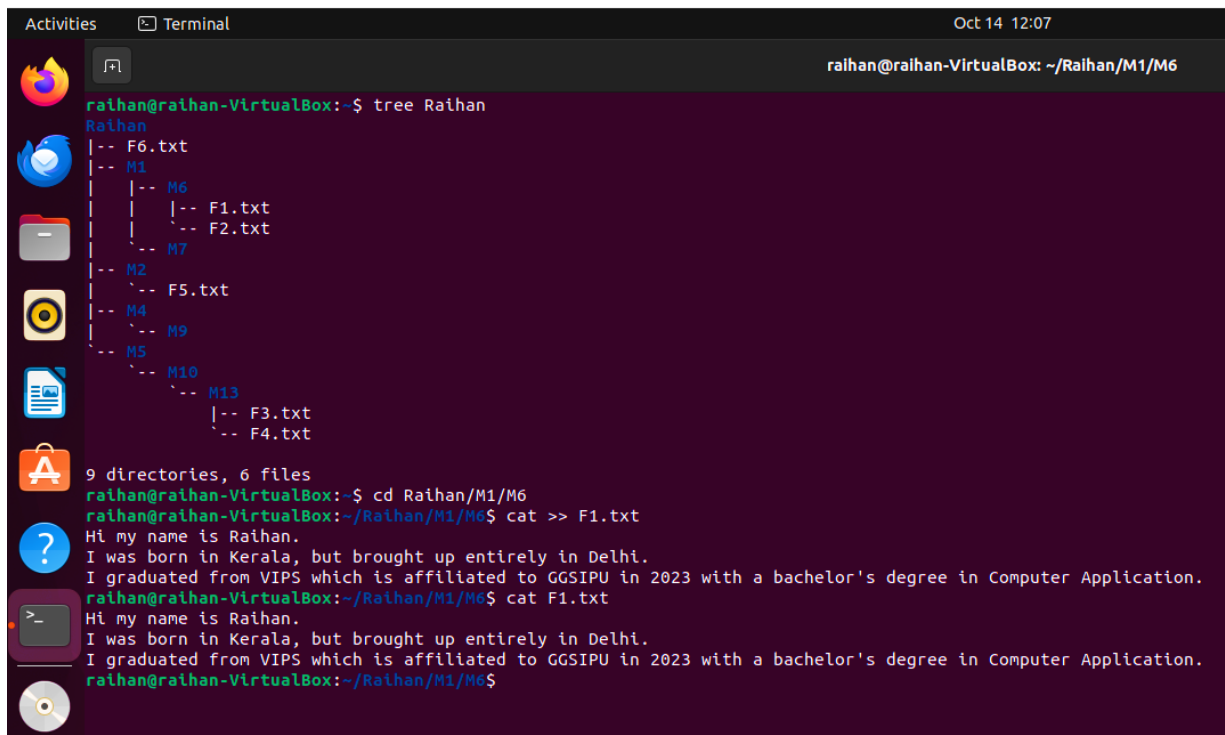


```
Activities Terminal

raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ mkdir Raihan
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public Raihan
raihan@raihan-VirtualBox:~$ cd Raihan
raihan@raihan-VirtualBox:~/Raihan$ mkdir -p M1/M6
raihan@raihan-VirtualBox:~/Raihan$ cd M1/M6
raihan@raihan-VirtualBox:~/Raihan/M1/M6$ cat > F1.txt
raihan@raihan-VirtualBox:~/Raihan/M1/M6$ cat > F2.txt
raihan@raihan-VirtualBox:~/Raihan/M1/M6$ cd ..
raihan@raihan-VirtualBox:~/Raihan/M1$ mkdir M7
raihan@raihan-VirtualBox:~/Raihan/M1$ cd ..
raihan@raihan-VirtualBox:~/Raihan$ mkdir M2
raihan@raihan-VirtualBox:~/Raihan$ cd M2
raihan@raihan-VirtualBox:~/Raihan/M2$ cat > F5.txt
raihan@raihan-VirtualBox:~/Raihan/M2$ cd ..
raihan@raihan-VirtualBox:~/Raihan$ cat > F6.txt
raihan@raihan-VirtualBox:~/Raihan$ mkdir -p M4/M9
raihan@raihan-VirtualBox:~/Raihan$ mkdir -p M5/M10/M13
raihan@raihan-VirtualBox:~/Raihan$ cd M5/M10/M13
raihan@raihan-VirtualBox:~/Raihan/M5/M10/M13$ cat > F3.txt
raihan@raihan-VirtualBox:~/Raihan/M5/M10/M13$ cat > F4.txt
raihan@raihan-VirtualBox:~/Raihan/M5/M10/M13$ cd
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M6
|   |   |-- F1.txt
|   |   |-- F2.txt
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- M9
|-- M5
|   |-- M10
|   |   |-- M13
|   |       |-- F3.txt
|   |       |-- F4.txt

9 directories, 6 files
raihan@raihan-VirtualBox:~$
```

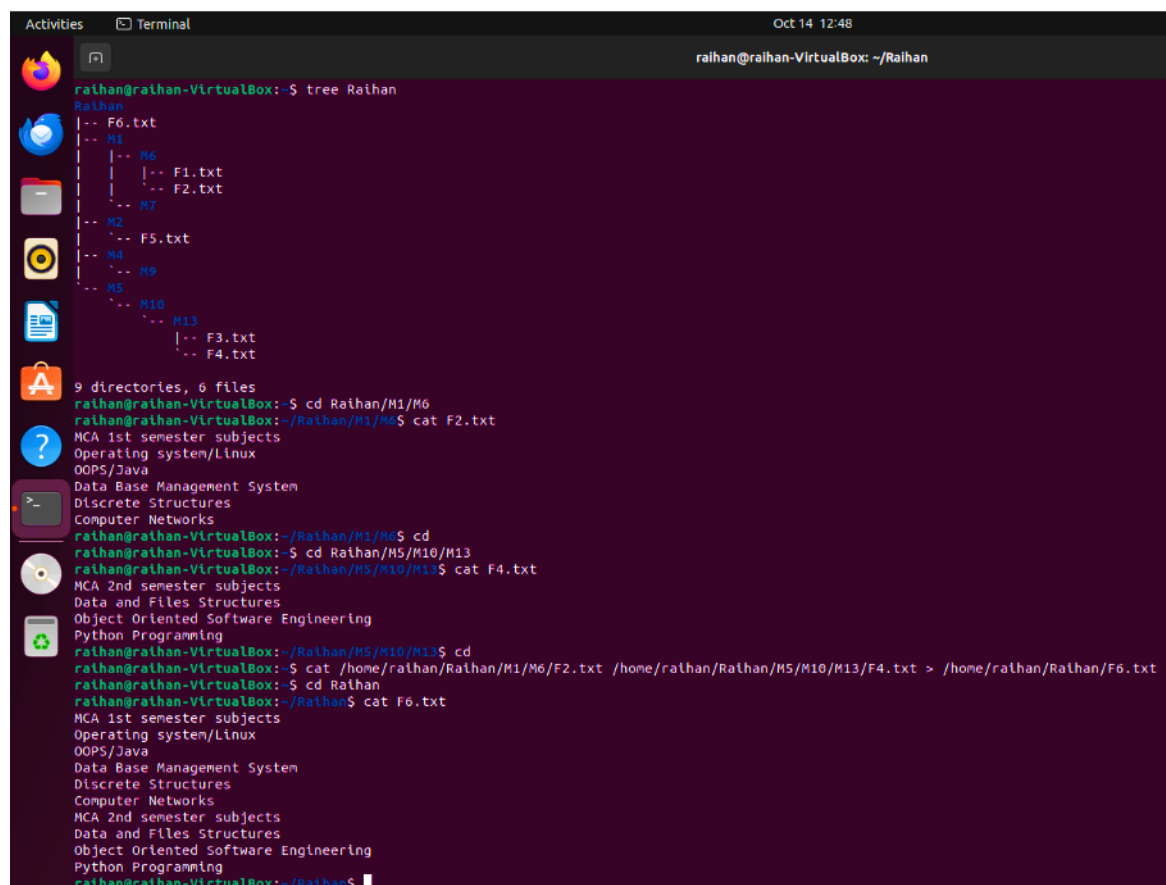
## 2 Append the contents of F1 file



A terminal window titled 'Terminal' with a date/time of 'Oct 14 12:07'. The user 'raihan' is in a virtual box named 'raihan-VirtualBox' at the path '~/Raihan/M1/M6'. The terminal shows a tree command output for the 'Raihan' directory, listing subdirectories M1 through M10 and files F1.txt through F4.txt. Below the tree output, it states '9 directories, 6 files'. The user then navigates to the directory and uses the 'cat >>' command to append the contents of 'F1.txt' to 'F6.txt'. The output shows the original content of F6.txt followed by the new content from F1.txt.

```
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M6
|   |   |-- F1.txt
|   |   |-- F2.txt
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- M9
|-- M5
|   |-- M10
|       |-- M13
|           |-- F3.txt
|           |-- F4.txt
9 directories, 6 files
raihan@raihan-VirtualBox:~$ cd Raihan/M1/M6
raihan@raihan-VirtualBox:~/Raihan/M1/M6$ cat >> F1.txt
Hi my name is Raihan.
I was born in Kerala, but brought up entirely in Delhi.
I graduated from VIPS which is affiliated to GGSIPU in 2023 with a bachelor's degree in Computer Application.
raihan@raihan-VirtualBox:~/Raihan/M1/M6$ cat F1.txt
Hi my name is Raihan.
I was born in Kerala, but brought up entirely in Delhi.
I graduated from VIPS which is affiliated to GGSIPU in 2023 with a bachelor's degree in Computer Application.
raihan@raihan-VirtualBox:~/Raihan/M1/M6$
```

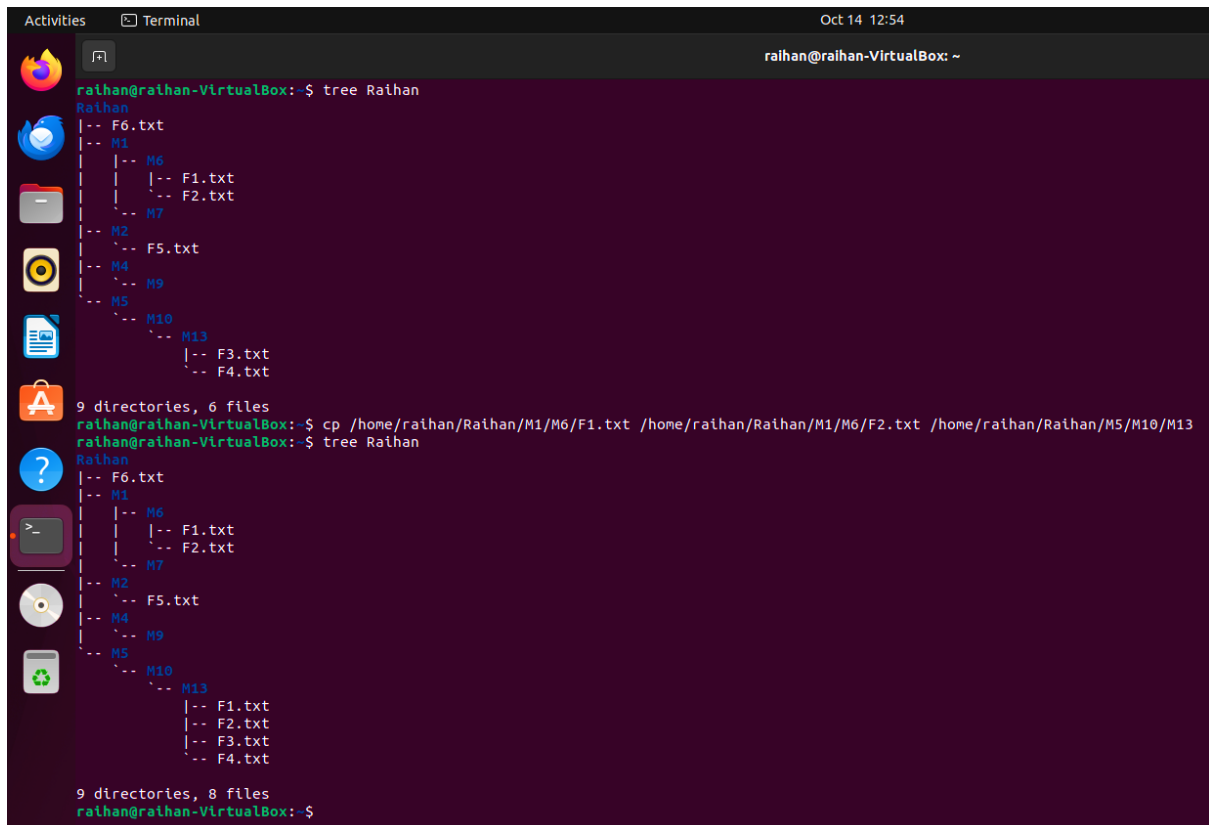
## 3 Merge the F2 & F4 file in F6 file



A terminal window titled 'Terminal' with a date/time of 'Oct 14 12:48'. The user 'raihan' is in a virtual box named 'raihan-VirtualBox' at the path '~/Raihan'. The terminal shows the same directory tree as before. The user navigates to the directory and uses the 'cat' command to view the contents of 'F2.txt'. Then, they navigate to the directory containing 'F4.txt' and use the 'cat' command to view its contents. Finally, they use the 'cat' command with the '>' operator to merge the contents of 'F2.txt' and 'F4.txt' into 'F6.txt'. The output shows the merged content of 'F6.txt'.

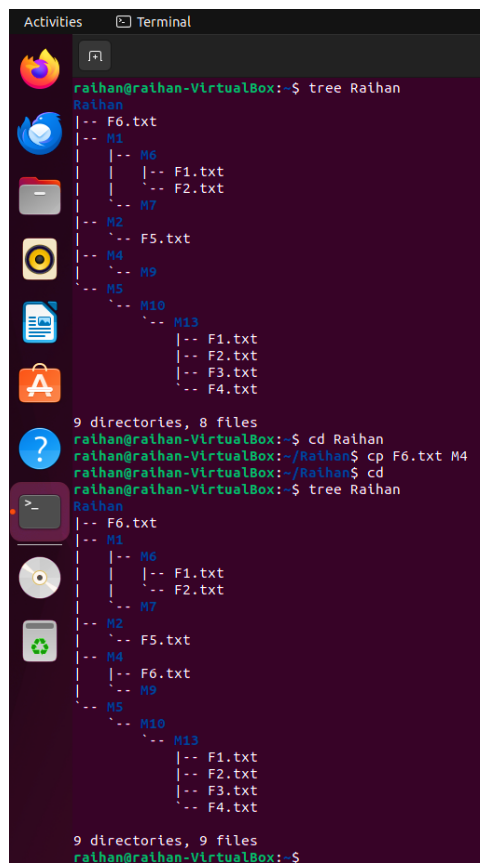
```
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M6
|   |   |-- F1.txt
|   |   |-- F2.txt
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- M9
|-- M5
|   |-- M10
|       |-- M13
|           |-- F3.txt
|           |-- F4.txt
9 directories, 6 files
raihan@raihan-VirtualBox:~$ cd Raihan/M1/M6
raihan@raihan-VirtualBox:~/Raihan/M1/M6$ cat F2.txt
MCA 1st semester subjects
Operating system/Linux
OOPS/Java
Data Base Management System
Discrete Structures
Computer Networks
raihan@raihan-VirtualBox:~/Raihan/M1/M6$ cd
raihan@raihan-VirtualBox:~$ cd Raihan/M5/M10/M13
raihan@raihan-VirtualBox:~/Raihan/M5/M10/M13$ cat F4.txt
MCA 2nd semester subjects
Data and Files Structures
Object Oriented Software Engineering
Python Programming
raihan@raihan-VirtualBox:~/Raihan/M5/M10/M13$ cd
raihan@raihan-VirtualBox:~$ cat /home/raihan/Raihan/M1/M6/F2.txt /home/raihan/Raihan/M5/M10/M13/F4.txt > /home/raihan/Raihan/F6.txt
raihan@raihan-VirtualBox:~$ cd Raihan
raihan@raihan-VirtualBox:~/Raihan$ cat F6.txt
MCA 1st semester subjects
Operating system/Linux
OOPS/Java
Data Base Management System
Discrete Structures
Computer Networks
MCA 2nd semester subjects
Data and Files Structures
Object Oriented Software Engineering
Python Programming
raihan@raihan-VirtualBox:~/Raihan$
```

#### 4 Copy F1 & F2 file in the M13 directory using absolute path

A terminal window titled 'Terminal' with a date/time of 'Oct 14 12:54'. The user 'raihan' is at a machine named 'raihan-VirtualBox'. The terminal shows a 'tree' command output for the 'Raihan' directory. It lists a hierarchy of folders (M1, M2, M4, M5, M10, M13) and files (F1.txt, F2.txt, F3.txt, F4.txt, F5.txt, F6.txt). The initial state shows 9 directories and 6 files. A 'cp' command is entered to copy 'F1.txt' and 'F2.txt' from the 'M1/M6' subdirectory to the 'M5/M10/M13' subdirectory using absolute paths. A second 'tree' command is run, showing that 'F3.txt' and 'F4.txt' have been added to the 'M13' directory, resulting in 9 directories and 8 files.

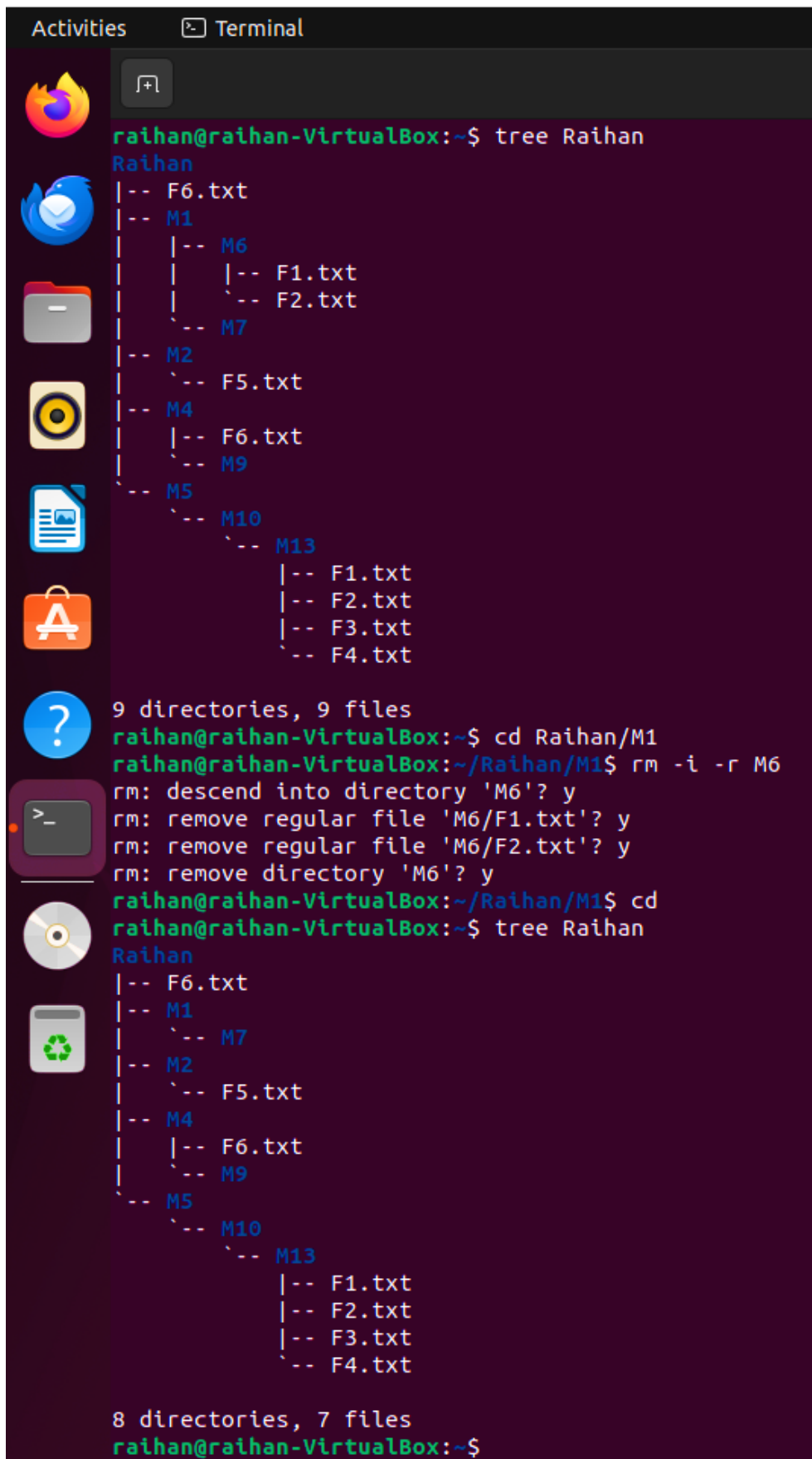
```
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M6
|   |   |-- F1.txt
|   |   |-- F2.txt
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- M9
|-- M5
|   |-- M10
|   |   |-- M13
|   |   |   |-- F3.txt
|   |   |   |-- F4.txt
9 directories, 6 files
raihan@raihan-VirtualBox:~$ cp /home/raihan/Raihan/M1/M6/F1.txt /home/raihan/Raihan/M1/M6/F2.txt /home/raihan/Raihan/M5/M10/M13
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M6
|   |   |-- F1.txt
|   |   |-- F2.txt
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- M9
|-- M5
|   |-- M10
|   |   |-- M13
|   |   |   |-- F1.txt
|   |   |   |-- F2.txt
|   |   |   |-- F3.txt
|   |   |   |-- F4.txt
9 directories, 8 files
raihan@raihan-VirtualBox:~$
```

#### 5 Copy F6 file in the M4 folder using relative path

A terminal window titled 'Terminal' with a date/time of 'Oct 14 12:54'. The user 'raihan' is at a machine named 'raihan-VirtualBox'. The terminal shows a 'tree' command output for the 'Raihan' directory, identical to the previous screenshot. The user then enters 'cd Raihan' to change the current directory. A 'cp' command is entered to copy 'F6.txt' from the current directory to the 'M4' subdirectory using a relative path. Another 'cd' command is entered to return to the home directory. A final 'tree' command is run, showing that 'F6.txt' has been added to the 'M4' directory, resulting in 9 directories and 9 files.

```
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M6
|   |   |-- F1.txt
|   |   |-- F2.txt
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- M9
|-- M5
|   |-- M10
|   |   |-- M13
|   |   |   |-- F1.txt
|   |   |   |-- F2.txt
|   |   |   |-- F3.txt
|   |   |   |-- F4.txt
9 directories, 8 files
raihan@raihan-VirtualBox:~$ cd Raihan
raihan@raihan-VirtualBox:~/Raihan$ cp F6.txt M4
raihan@raihan-VirtualBox:~/Raihan$ cd
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M6
|   |   |-- F1.txt
|   |   |-- F2.txt
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- F6.txt
|   |-- M9
|-- M5
|   |-- M10
|   |   |-- M13
|   |   |   |-- F1.txt
|   |   |   |-- F2.txt
|   |   |   |-- F3.txt
|   |   |   |-- F4.txt
9 directories, 9 files
raihan@raihan-VirtualBox:~$
```

## 6 Delete the M6 folder with confirmation using rmdir command



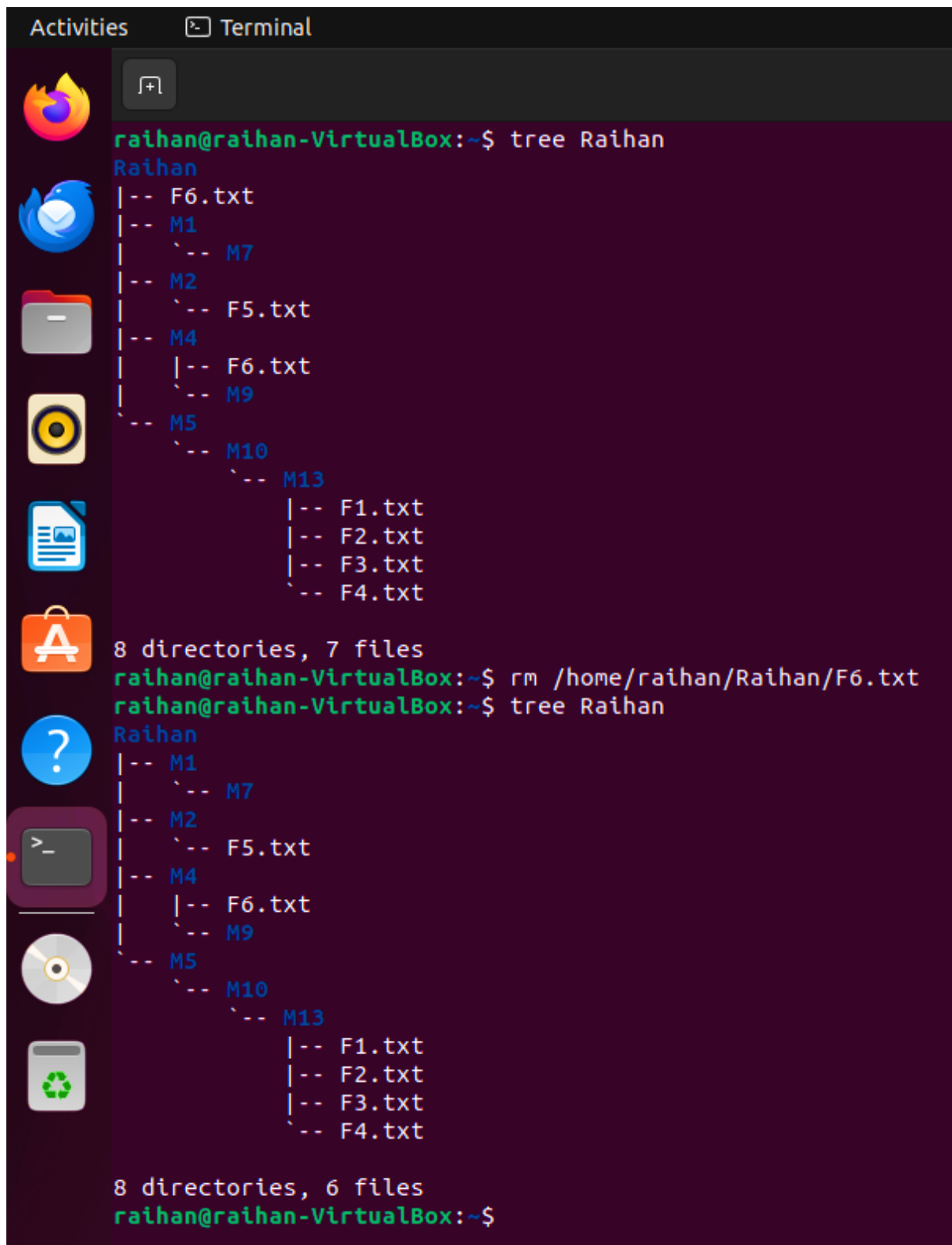
The image shows a terminal window with a dark background and light-colored text. On the left side, there is a vertical sidebar with various application icons: Firefox, Telegram, a file manager, a music player, a document viewer, an app store, a help icon, a terminal icon (highlighted), a CD/DVD icon, and a trash icon. The terminal output shows the following sequence of commands and results:

```
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M6
|   |   |-- F1.txt
|   |   |-- F2.txt
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- F6.txt
|   |-- M9
|-- M5
|   |-- M10
|   |-- M13
|       |-- F1.txt
|       |-- F2.txt
|       |-- F3.txt
|       |-- F4.txt

9 directories, 9 files
raihan@raihan-VirtualBox:~$ cd Raihan/M1
raihan@raihan-VirtualBox:~/Raihan/M1$ rm -i -r M6
rm: descend into directory 'M6'? y
rm: remove regular file 'M6/F1.txt'? y
rm: remove regular file 'M6/F2.txt'? y
rm: remove directory 'M6'? y
raihan@raihan-VirtualBox:~/Raihan/M1$ cd
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- F6.txt
|   |-- M9
|-- M5
|   |-- M10
|   |-- M13
|       |-- F1.txt
|       |-- F2.txt
|       |-- F3.txt
|       |-- F4.txt

8 directories, 7 files
raihan@raihan-VirtualBox:~$
```

## 7 Delete the F6 file using absolute path

A terminal window titled 'Terminal' is shown on a desktop environment. The terminal displays the output of the 'tree' command for a directory named 'Raihan'. The first output shows 8 directories and 7 files, including 'F6.txt'. The user then enters the command 'rm /home/raihan/Raihan/F6.txt'. The second 'tree' command output shows that 'F6.txt' has been removed, leaving 8 directories and 6 files. The terminal window has a dark background with light-colored text. On the left side of the terminal window, there is a vertical dock with various application icons: Firefox, Thunderbird, a file manager, a music player, a document viewer, an application store, a help icon, a terminal icon (which is highlighted), a CD/DVD icon, and a trash icon.

```
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- F6.txt
|-- M1
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- F6.txt
|   |-- M9
|-- M5
|   |-- M10
|       |-- M13
|           |-- F1.txt
|           |-- F2.txt
|           |-- F3.txt
|           |-- F4.txt

8 directories, 7 files
raihan@raihan-VirtualBox:~$ rm /home/raihan/Raihan/F6.txt
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- M1
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- F6.txt
|   |-- M9
|-- M5
|   |-- M10
|       |-- M13
|           |-- F1.txt
|           |-- F2.txt
|           |-- F3.txt
|           |-- F4.txt

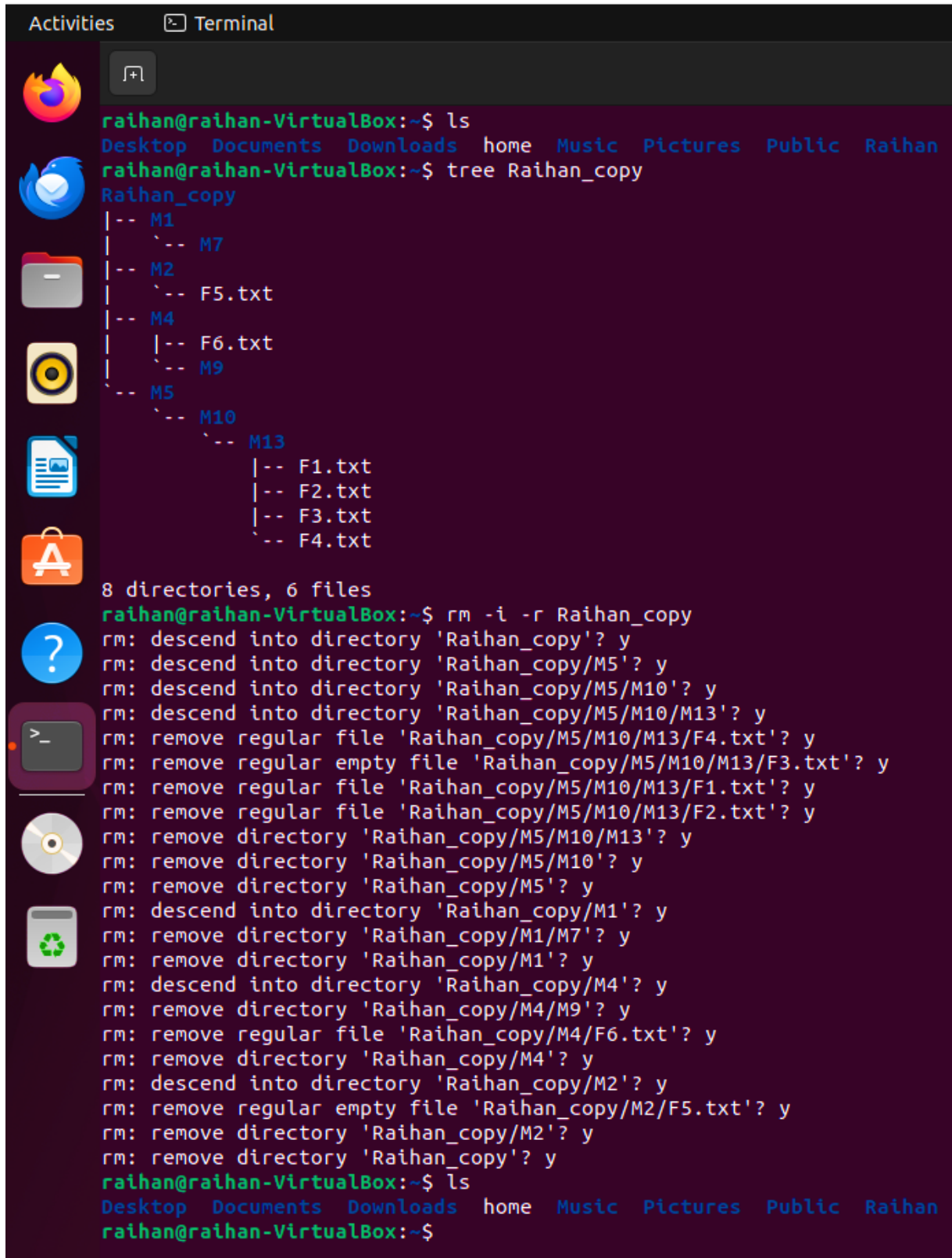
8 directories, 6 files
raihan@raihan-VirtualBox:~$
```



**8 Copy the whole structure in new folder [any name] & display all files and folders which are copied to new folder**

```
Activities Terminal
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ cp -r Raihan Raihan_copy
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- M1
|   |-- M7
|   |-- M2
|   |   |-- F5.txt
|   |   |-- M4
|   |       |-- F6.txt
|   |       |-- M9
|   |-- M5
|   |   |-- M10
|   |       |-- M13
|   |           |-- F1.txt
|   |           |-- F2.txt
|   |           |-- F3.txt
|   |           |-- F4.txt
|   |-- M3
|   |-- M6
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|   |-- M502
|   |-- M503
|   |-- M50
```

9 Try to delete the new folder with confirmation and also display the list of removed files

A terminal window titled 'Terminal' is shown. The user 'raihan' is in a 'VirtualBox' environment. The terminal displays the following commands and output:  
1. `ls`: Lists the current directory contents: Desktop, Documents, Downloads, home, Music, Pictures, Public, and Raihan.  
2. `tree Raihan_copy`: Shows a directory tree for 'Raihan\_copy'. It contains directories M1, M2, M4, and M5. M1 contains M7. M2 contains F5.txt. M4 contains F6.txt and M9. M5 contains M10, which contains M13. M13 contains F1.txt, F2.txt, F3.txt, and F4.txt.  
3. Summary: '8 directories, 6 files'.  
4. `rm -i -r Raihan_copy`: Recursively removes the directory with interactive prompts. The prompts are: 'rm: descend into directory 'Raihan\_copy'? y', 'rm: descend into directory 'Raihan\_copy/M5'? y', 'rm: descend into directory 'Raihan\_copy/M5/M10'? y', 'rm: descend into directory 'Raihan\_copy/M5/M10/M13'? y', 'rm: remove regular file 'Raihan\_copy/M5/M10/M13/F4.txt'? y', 'rm: remove regular empty file 'Raihan\_copy/M5/M10/M13/F3.txt'? y', 'rm: remove regular file 'Raihan\_copy/M5/M10/M13/F1.txt'? y', 'rm: remove regular file 'Raihan\_copy/M5/M10/M13/F2.txt'? y', 'rm: remove directory 'Raihan\_copy/M5/M10/M13'? y', 'rm: remove directory 'Raihan\_copy/M5/M10'? y', 'rm: remove directory 'Raihan\_copy/M5'? y', 'rm: descend into directory 'Raihan\_copy/M1'? y', 'rm: remove directory 'Raihan\_copy/M1/M7'? y', 'rm: remove directory 'Raihan\_copy/M1'? y', 'rm: descend into directory 'Raihan\_copy/M4'? y', 'rm: remove directory 'Raihan\_copy/M4/M9'? y', 'rm: remove regular file 'Raihan\_copy/M4/F6.txt'? y', 'rm: remove directory 'Raihan\_copy/M4'? y', 'rm: descend into directory 'Raihan\_copy/M2'? y', 'rm: remove regular empty file 'Raihan\_copy/M2/F5.txt'? y', 'rm: remove directory 'Raihan\_copy/M2'? y', and 'rm: remove directory 'Raihan\_copy'? y'.  
5. `ls`: Lists the current directory contents again, showing the same files as before, indicating the directory was successfully removed.  
The terminal window has a sidebar on the left with icons for various applications: Firefox, Thunderbird, Files, GIMP, LibreOffice Writer, App Store, Help, and a terminal icon (which is highlighted).

```
raihan@raihan-VirtualBox:~$ ls
Desktop  Documents  Downloads  home  Music  Pictures  Public  Raihan
raihan@raihan-VirtualBox:~$ tree Raihan_copy
Raihan_copy
|-- M1
|   |-- M7
|-- M2
|   |-- F5.txt
|-- M4
|   |-- F6.txt
|   |-- M9
|-- M5
|   |-- M10
|       |-- M13
|           |-- F1.txt
|           |-- F2.txt
|           |-- F3.txt
|           |-- F4.txt
--
8 directories, 6 files
raihan@raihan-VirtualBox:~$ rm -i -r Raihan_copy
rm: descend into directory 'Raihan_copy'? y
rm: descend into directory 'Raihan_copy/M5'? y
rm: descend into directory 'Raihan_copy/M5/M10'? y
rm: descend into directory 'Raihan_copy/M5/M10/M13'? y
rm: remove regular file 'Raihan_copy/M5/M10/M13/F4.txt'? y
rm: remove regular empty file 'Raihan_copy/M5/M10/M13/F3.txt'? y
rm: remove regular file 'Raihan_copy/M5/M10/M13/F1.txt'? y
rm: remove regular file 'Raihan_copy/M5/M10/M13/F2.txt'? y
rm: remove directory 'Raihan_copy/M5/M10/M13'? y
rm: remove directory 'Raihan_copy/M5/M10'? y
rm: remove directory 'Raihan_copy/M5'? y
rm: descend into directory 'Raihan_copy/M1'? y
rm: remove directory 'Raihan_copy/M1/M7'? y
rm: remove directory 'Raihan_copy/M1'? y
rm: descend into directory 'Raihan_copy/M4'? y
rm: remove directory 'Raihan_copy/M4/M9'? y
rm: remove regular file 'Raihan_copy/M4/F6.txt'? y
rm: remove directory 'Raihan_copy/M4'? y
rm: descend into directory 'Raihan_copy/M2'? y
rm: remove regular empty file 'Raihan_copy/M2/F5.txt'? y
rm: remove directory 'Raihan_copy/M2'? y
rm: remove directory 'Raihan_copy'? y
raihan@raihan-VirtualBox:~$ ls
Desktop  Documents  Downloads  home  Music  Pictures  Public  Raihan
raihan@raihan-VirtualBox:~$
```

## 10 Save the whole detail (syntax etc.) of cp command in new file

Activities Terminal Oct 14 19:40

Terminal

raihan@raihan-VirtualBox: ~

raihan@raihan-VirtualBox:~\$ ls

Desktop Documents Downloads home Music Pictures Public Raihan snap Templates Videos

raihan@raihan-VirtualBox:~\$ man cp > cp\_command\_details.txt

raihan@raihan-VirtualBox:~\$ ls

cp\_command\_details.txt Desktop Documents Downloads home Music Pictures Public Raihan snap Templates Videos

raihan@raihan-VirtualBox:~\$ cat cp\_command\_details.txt

CP(1)

User Commands

NAME

cp - copy files and directories

SYNOPSIS

cp [OPTION]... [-T] SOURCE DEST

cp [OPTION]... SOURCE... DIRECTORY

cp [OPTION]... -t DIRECTORY SOURCE...

DESCRIPTION

Copy SOURCE to DEST, or multiple SOURCE(s) to DIRECTORY.

Mandatory arguments to long options are mandatory for short options too.

-a, --archive

same as -dR --preserve=all

## 11 Copy this file into the M10 folder

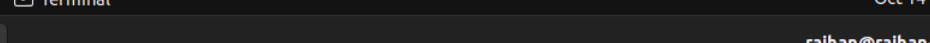
The screenshot shows a terminal window with the following content:

```

Activities Terminal
raihan@raihan-VirtualBox:~$ ls
cp_command_details.txt Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- M1
|   |-- M7
|   |-- M2
|   |   |-- F5.txt
|   |   |-- M4
|   |       |-- F6.txt
|   |       |-- M9
|   |-- M5
|       |-- M10
|           |-- M13
|               |-- F1.txt
|               |-- F2.txt
|               |-- F3.txt
|               |-- F4.txt
8 directories, 6 files
raihan@raihan-VirtualBox:~$ cp cp_command_details.txt /home/raihan/Raihan/M5/M10
raihan@raihan-VirtualBox:~$ tree Raihan
Raihan
|-- M1
|   |-- M7
|   |-- M2
|   |   |-- F5.txt
|   |   |-- M4
|   |       |-- F6.txt
|   |       |-- M9
|   |-- M5
|       |-- M10
|           |-- M13
|               |-- F1.txt
|               |-- F2.txt
|               |-- F3.txt
|               |-- F4.txt
|               |-- cp_command_details.txt
8 directories, 7 files
raihan@raihan-VirtualBox:~$

```

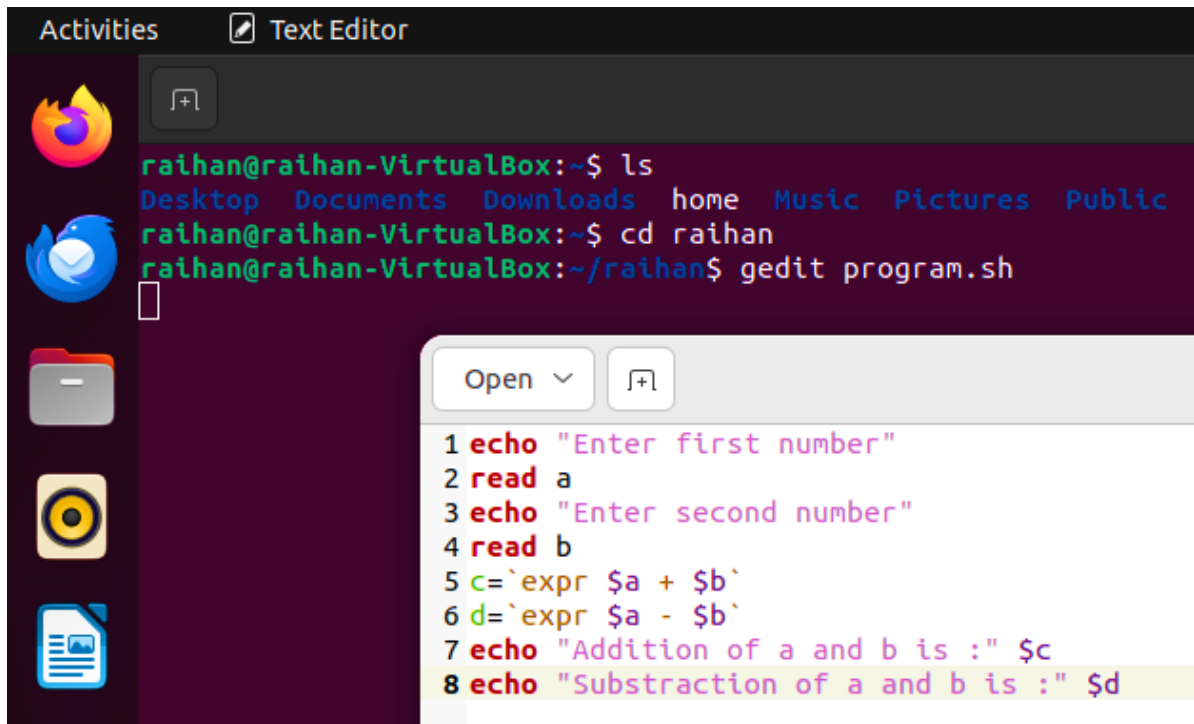
## 12 Delete your whole directory structure using a single command



The terminal window shows the following commands and output:

```
raihan@raihan-VirtualBox: ~  
raihan@raihan-VirtualBox:~$ ls  
Desktop Documents Downloads home Music Pictures Public Raihan snap Templates Videos  
raihan@raihan-VirtualBox:~$ rm -r Raihan  
raihan@raihan-VirtualBox:~$ ls  
Desktop Documents Downloads home Music Pictures Public snap Templates Videos  
raihan@raihan-VirtualBox:~$ cd Raihan  
bash: cd: Raihan: No such file or directory  
raihan@raihan-VirtualBox:~$
```

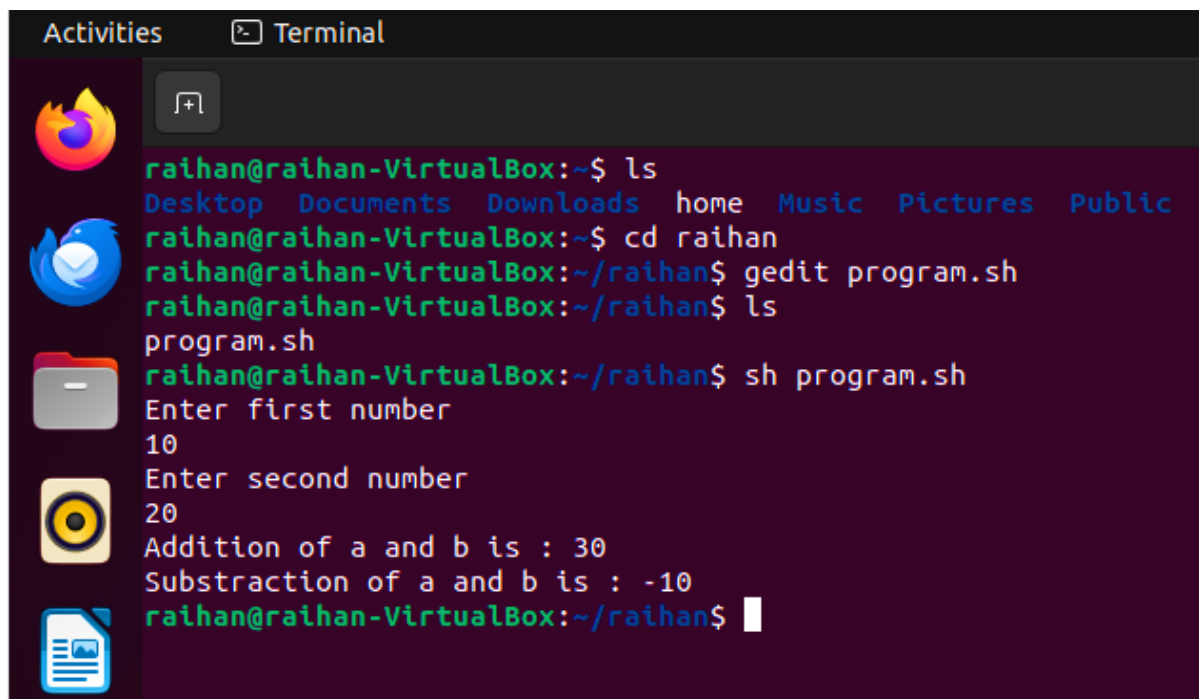
### 13 Write a shell script to print addition & subtraction of two numbers



```
Activities Text Editor

raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ cd raihan
raihan@raihan-VirtualBox:~/raihan$ gedit program.sh

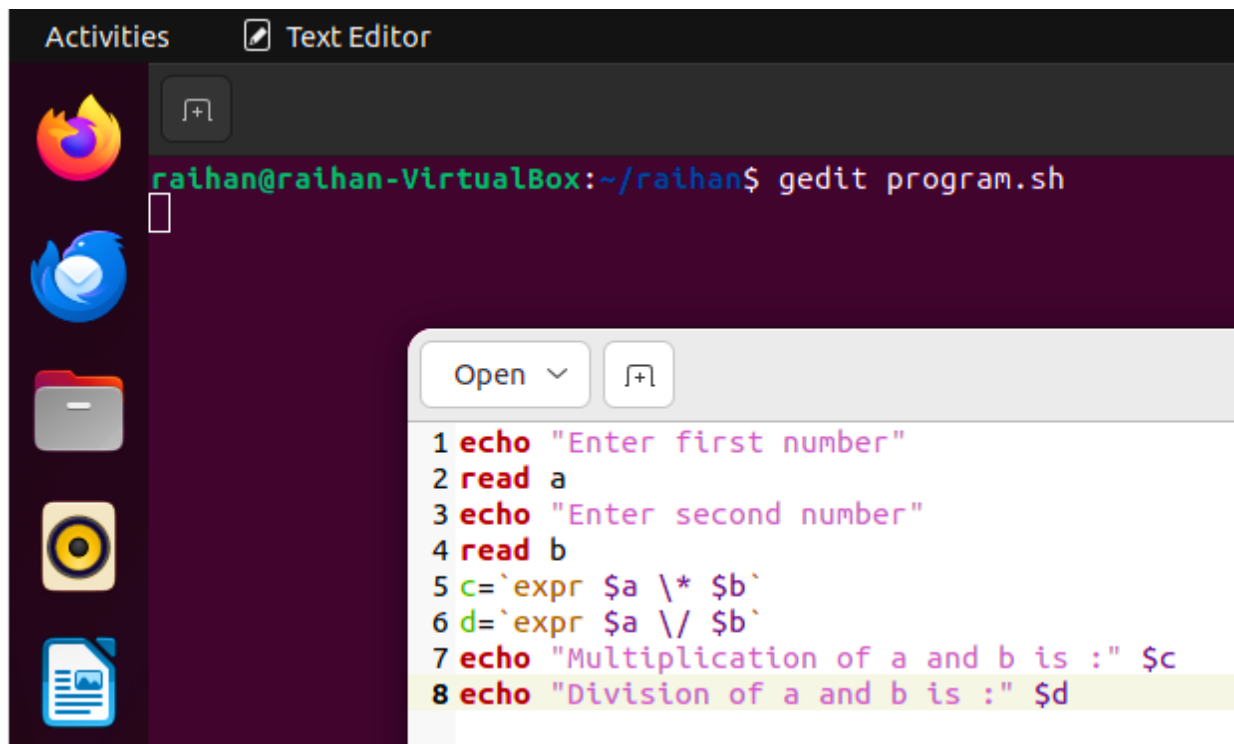
1 echo "Enter first number"
2 read a
3 echo "Enter second number"
4 read b
5 c=`expr $a + $b`
6 d=`expr $a - $b`
7 echo "Addition of a and b is :" $c
8 echo "Substraction of a and b is :" $d
```



```
Activities Terminal

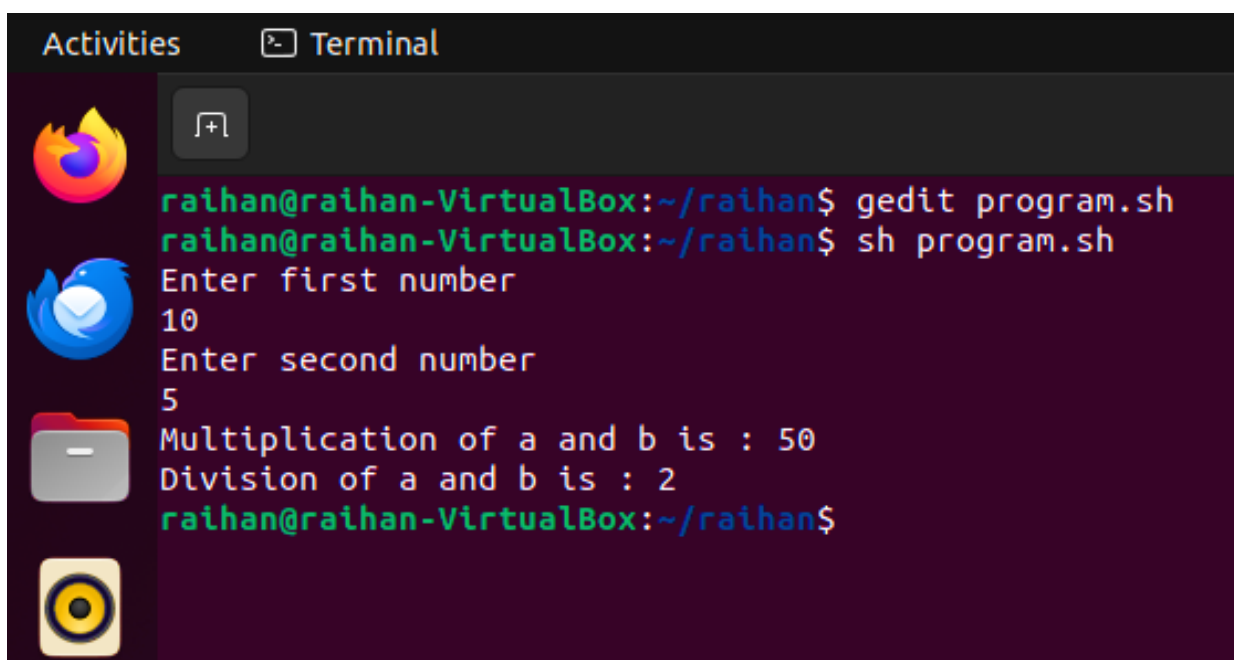
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ cd raihan
raihan@raihan-VirtualBox:~/raihan$ gedit program.sh
raihan@raihan-VirtualBox:~/raihan$ ls
program.sh
raihan@raihan-VirtualBox:~/raihan$ sh program.sh
Enter first number
10
Enter second number
20
Addition of a and b is : 30
Substraction of a and b is : -10
raihan@raihan-VirtualBox:~/raihan$
```

#### 14 Write a shell script to print multiplication & division of two numbers



The screenshot shows a Linux desktop environment with a sidebar containing icons for Firefox, a mail client, a file manager, a music player, and a document viewer. The main window is titled 'Text Editor' and displays a shell script file named 'program.sh'. The script contains the following code:

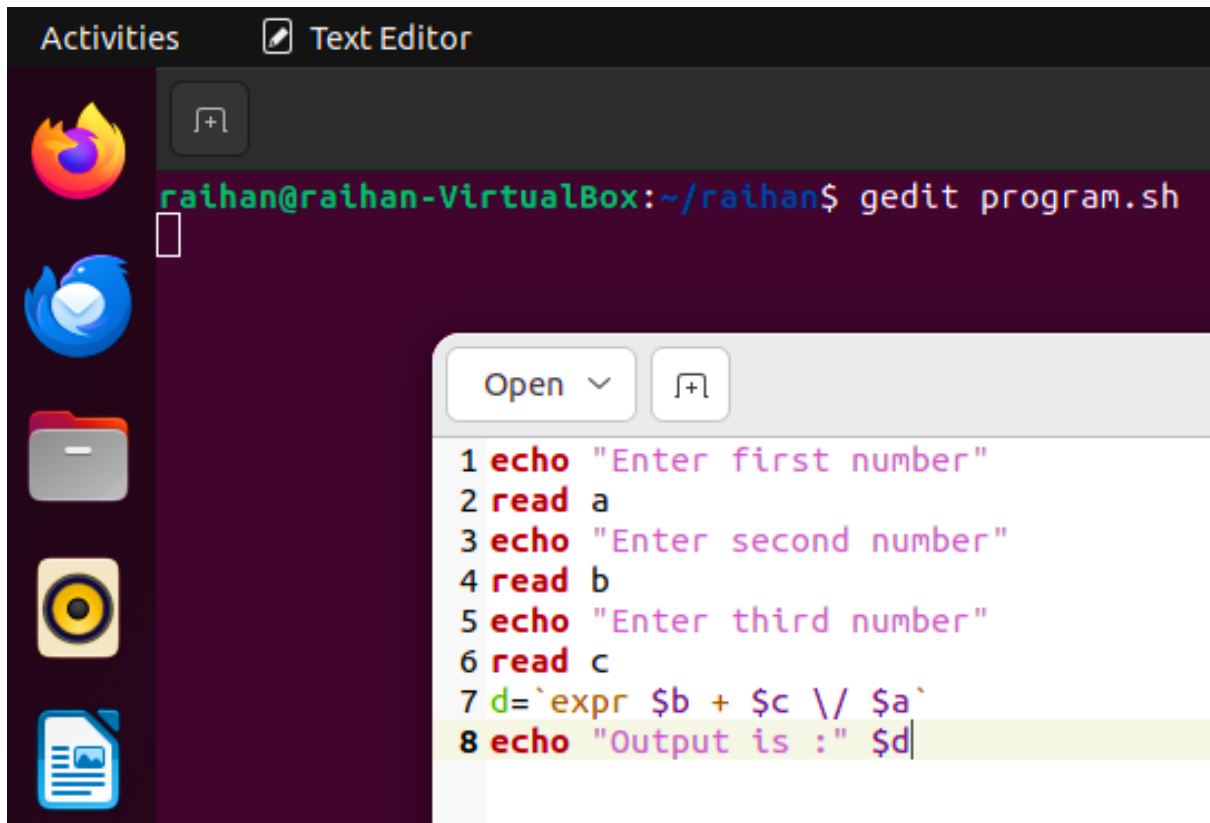
```
1 echo "Enter first number"
2 read a
3 echo "Enter second number"
4 read b
5 c=`expr $a \* $b`
6 d=`expr $a \/ $b`
7 echo "Multiplication of a and b is :" $c
8 echo "Division of a and b is :" $d
```



The screenshot shows the same Linux desktop environment, but the main window is now titled 'Terminal'. It shows the execution of the shell script 'program.sh'. The user enters the first number '10' and the second number '5'. The script outputs the multiplication result '50' and the division result '2'.

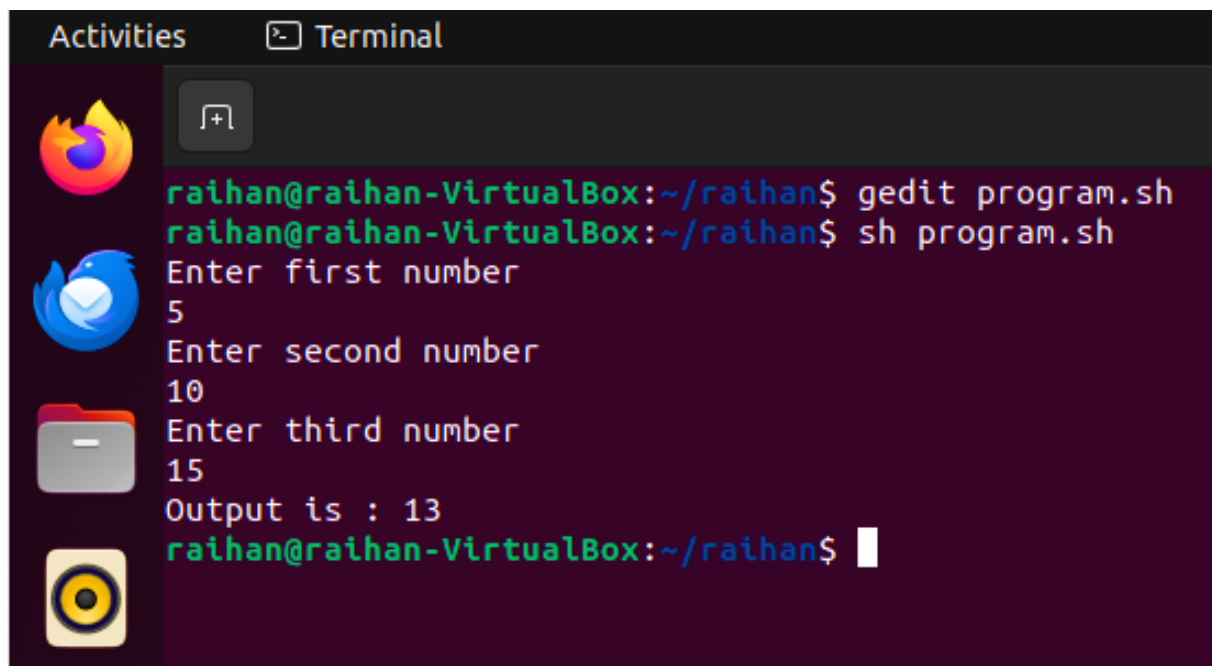
```
raihan@raihan-VirtualBox:~/raihan$ gedit program.sh
raihan@raihan-VirtualBox:~/raihan$ sh program.sh
Enter first number
10
Enter second number
5
Multiplication of a and b is : 50
Division of a and b is : 2
raihan@raihan-VirtualBox:~/raihan$
```

15 Perform following function by shell script :  $D=b+c/a$



The screenshot shows a Linux desktop environment with a sidebar containing icons for Firefox, Thunderbird, a file manager, a media player, and a document. The main window is a terminal titled "Text Editor" showing the command `gedit program.sh`. A gedit window is open, displaying the following shell script:

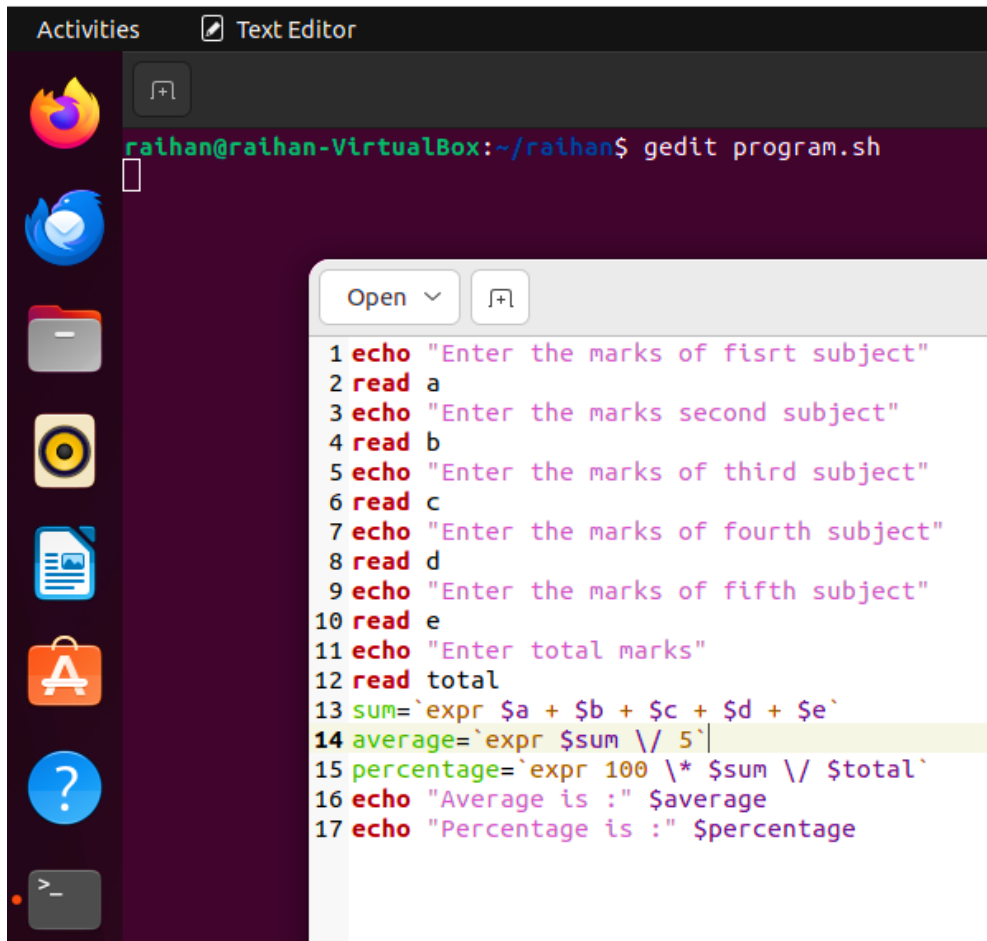
```
1 echo "Enter first number"
2 read a
3 echo "Enter second number"
4 read b
5 echo "Enter third number"
6 read c
7 d=`expr $b + $c \/ $a`
8 echo "Output is :" $d
```



The screenshot shows the same Linux desktop environment, but the terminal window is now titled "Terminal". It shows the execution of the shell script `program.sh`. The user enters the numbers 5, 10, and 15 in response to the prompts. The script calculates the result and displays it.

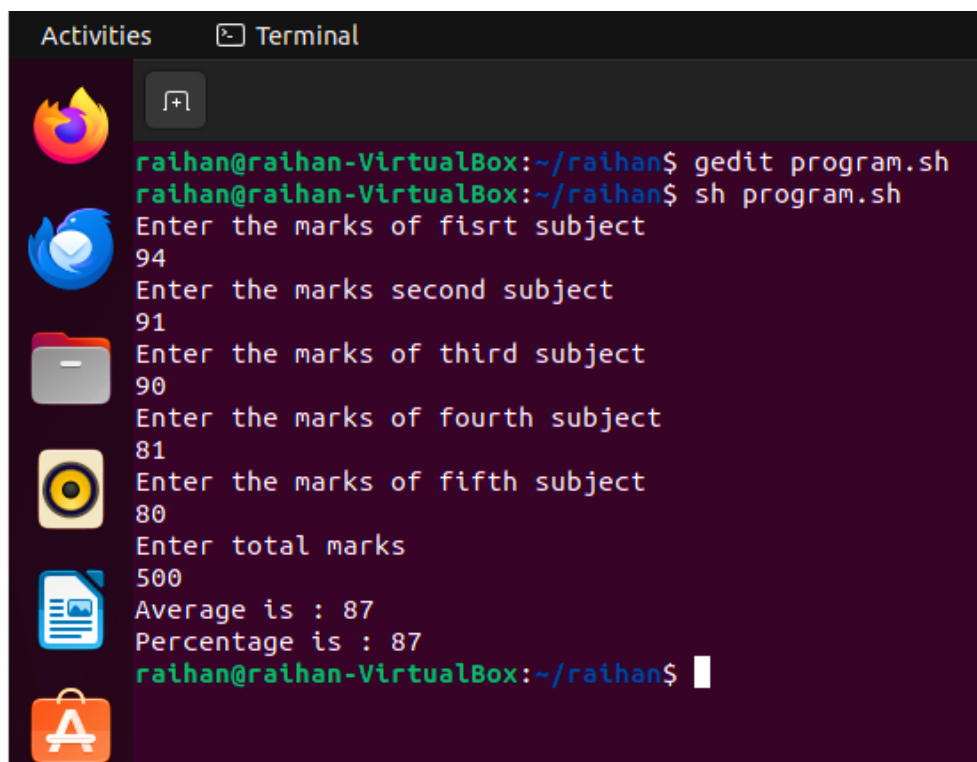
```
raihan@raihan-VirtualBox:~/raihan$ gedit program.sh
raihan@raihan-VirtualBox:~/raihan$ sh program.sh
Enter first number
5
Enter second number
10
Enter third number
15
Output is : 13
raihan@raihan-VirtualBox:~/raihan$
```

16 Write the shell script to calculate average & percentage of marks entered by user



The screenshot shows a text editor window titled "Text Editor" with a dark theme. The editor contains a shell script named "program.sh". The script prompts the user to enter marks for five subjects, calculates the sum, average, and percentage, and then displays the results. The script is as follows:

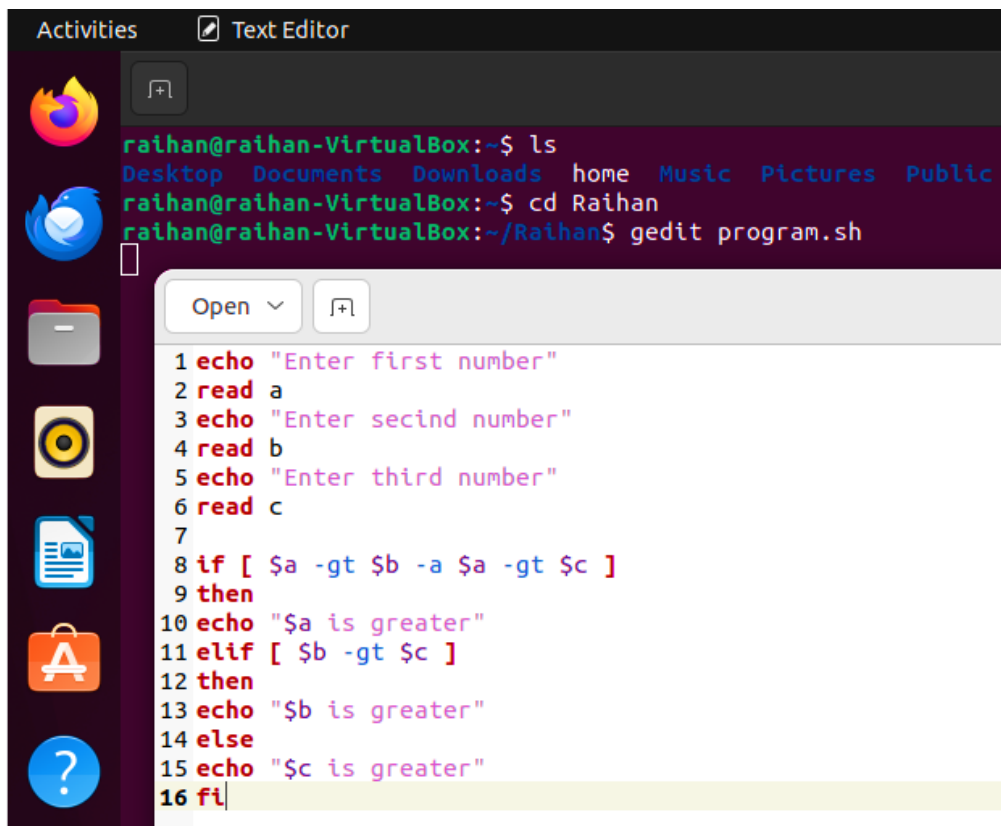
```
1 echo "Enter the marks of fisrt subject"
2 read a
3 echo "Enter the marks second subject"
4 read b
5 echo "Enter the marks of third subject"
6 read c
7 echo "Enter the marks of fourth subject"
8 read d
9 echo "Enter the marks of fifth subject"
10 read e
11 echo "Enter total marks"
12 read total
13 sum=`expr $a + $b + $c + $d + $e`
14 average=`expr $sum \/ 5`
15 percentage=`expr 100 \* $sum \/ $total`
16 echo "Average is :" $average
17 echo "Percentage is :" $percentage
```



The screenshot shows a terminal window titled "Terminal" with a dark theme. The terminal displays the execution of the shell script "program.sh". The user enters marks for five subjects (94, 91, 90, 81, 80) and the total marks (500). The script calculates the average (87) and percentage (87) and displays the results.

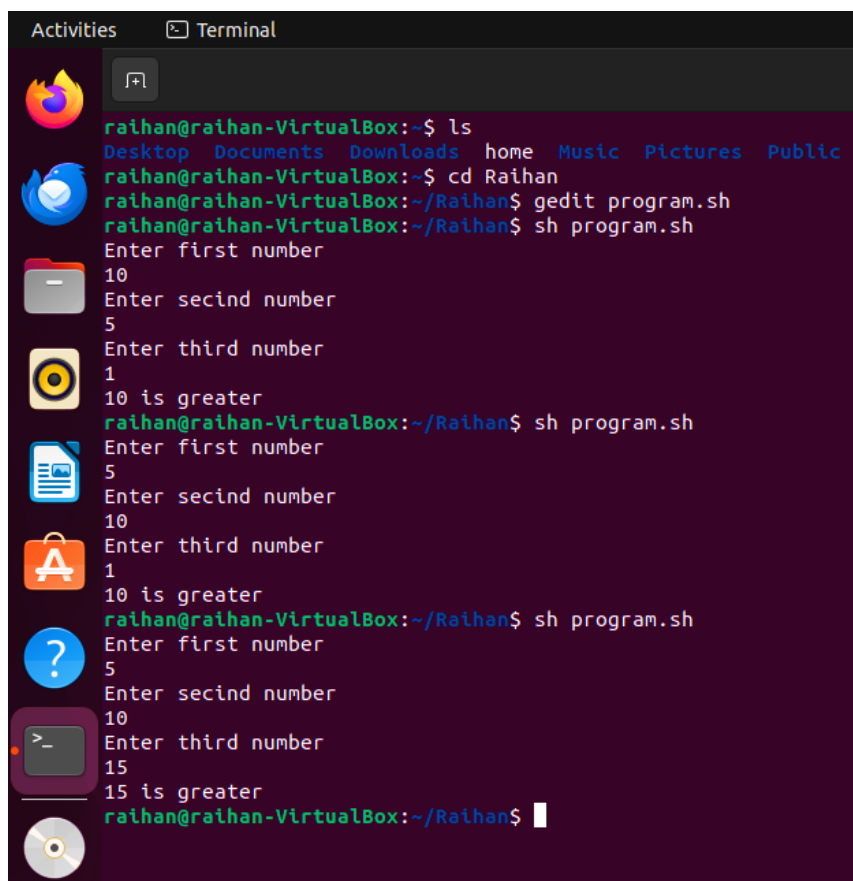
```
raihan@raihan-VirtualBox:~/raihan$ gedit program.sh
raihan@raihan-VirtualBox:~/raihan$ sh program.sh
Enter the marks of fisrt subject
94
Enter the marks second subject
91
Enter the marks of third subject
90
Enter the marks of fourth subject
81
Enter the marks of fifth subject
80
Enter total marks
500
Average is : 87
Percentage is : 87
raihan@raihan-VirtualBox:~/raihan$
```

17 Write a shell script to accept 3 numbers from user and find the largest among them



```
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ cd Raihan
raihan@raihan-VirtualBox:~/Raihan$ gedit program.sh

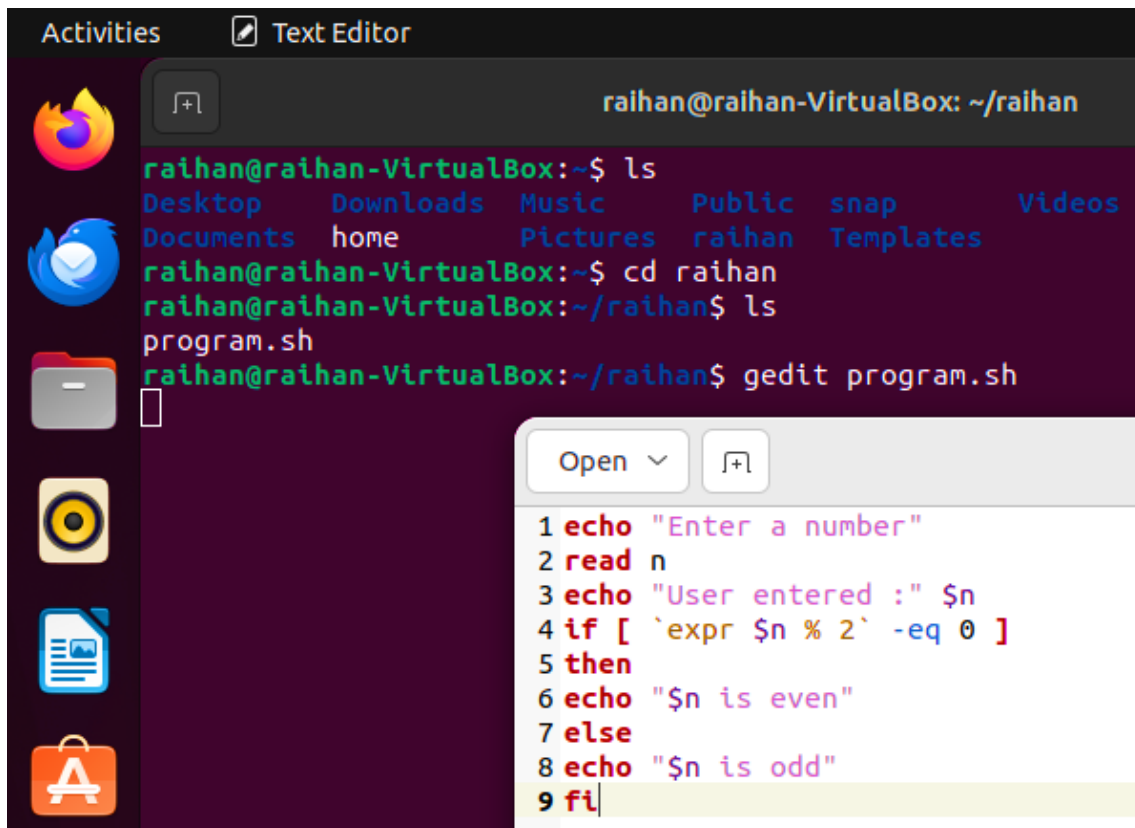
1 echo "Enter first number"
2 read a
3 echo "Enter secind number"
4 read b
5 echo "Enter third number"
6 read c
7
8 if [ $a -gt $b -a $a -gt $c ]
9 then
10 echo "$a is greater"
11 elif [ $b -gt $c ]
12 then
13 echo "$b is greater"
14 else
15 echo "$c is greater"
16 fi
```



```
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ cd Raihan
raihan@raihan-VirtualBox:~/Raihan$ gedit program.sh
raihan@raihan-VirtualBox:~/Raihan$ sh program.sh
Enter first number
10
Enter secind number
5
Enter third number
1
10 is greater
raihan@raihan-VirtualBox:~/Raihan$ sh program.sh
Enter first number
5
Enter secind number
10
Enter third number
1
10 is greater
raihan@raihan-VirtualBox:~/Raihan$ sh program.sh
Enter first number
5
Enter secind number
10
Enter third number
15
15 is greater
raihan@raihan-VirtualBox:~/Raihan$
```

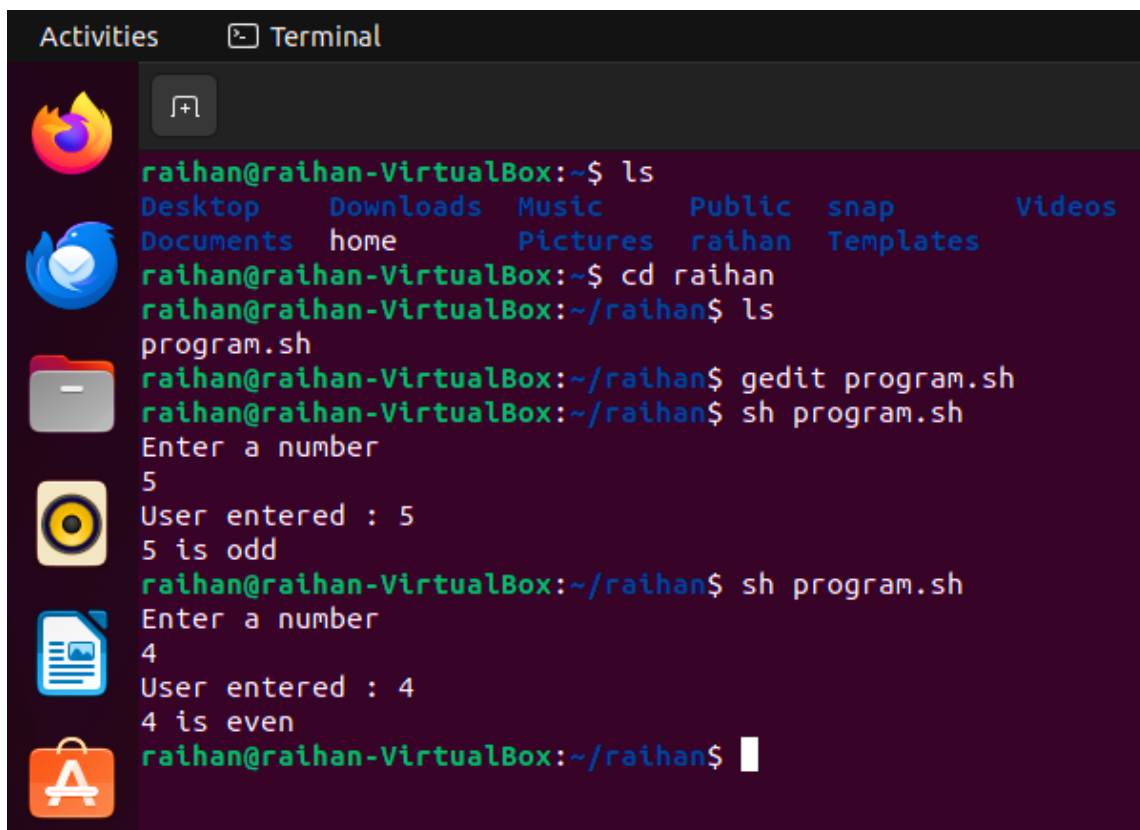


18 Write a shell script to print if the number is odd or even accepted from user



```
raihan@raihan-VirtualBox: ~$ ls
Desktop  Downloads  Music      Public    snap      Videos
Documents home       Pictures   raihan    Templates
raihan@raihan-VirtualBox:~$ cd raihan
raihan@raihan-VirtualBox:~/raihan$ ls
program.sh
raihan@raihan-VirtualBox:~/raihan$ gedit program.sh

1 echo "Enter a number"
2 read n
3 echo "User entered : " $n
4 if [ `expr $n % 2` -eq 0 ]
5 then
6 echo "$n is even"
7 else
8 echo "$n is odd"
9 fi
```



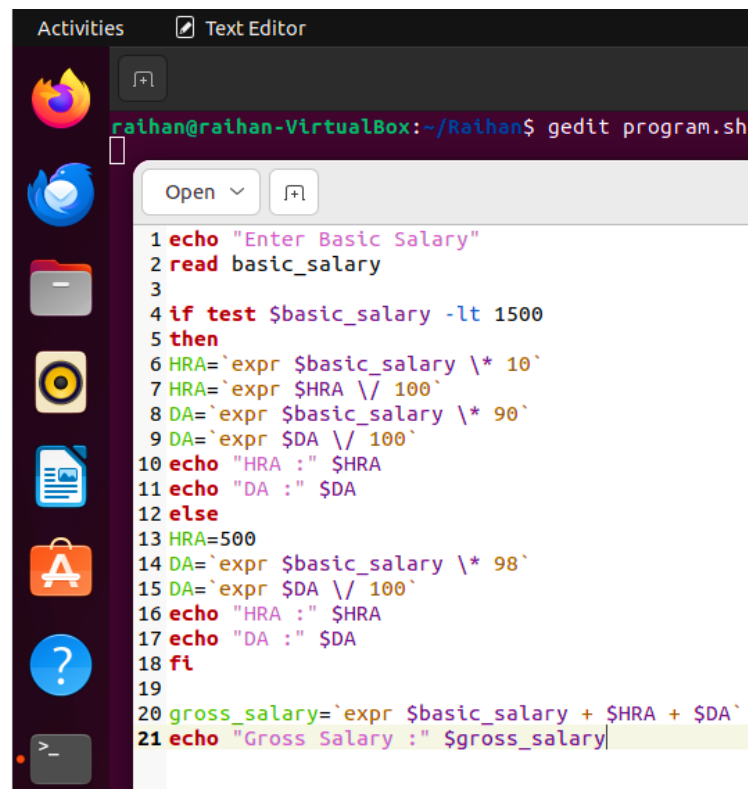
```
raihan@raihan-VirtualBox:~$ ls
Desktop  Downloads  Music      Public    snap      Videos
Documents home       Pictures   raihan    Templates
raihan@raihan-VirtualBox:~$ cd raihan
raihan@raihan-VirtualBox:~/raihan$ ls
program.sh
raihan@raihan-VirtualBox:~/raihan$ gedit program.sh
raihan@raihan-VirtualBox:~/raihan$ sh program.sh
Enter a number
5
User entered : 5
5 is odd
raihan@raihan-VirtualBox:~/raihan$ sh program.sh
Enter a number
4
User entered : 4
4 is even
raihan@raihan-VirtualBox:~/raihan$
```

19 Write a shell script that computes the gross salary of an employee according to the following rules

a) if basic salary is < 1500 then HRA=10% of the basic salary and DA=90% of basic

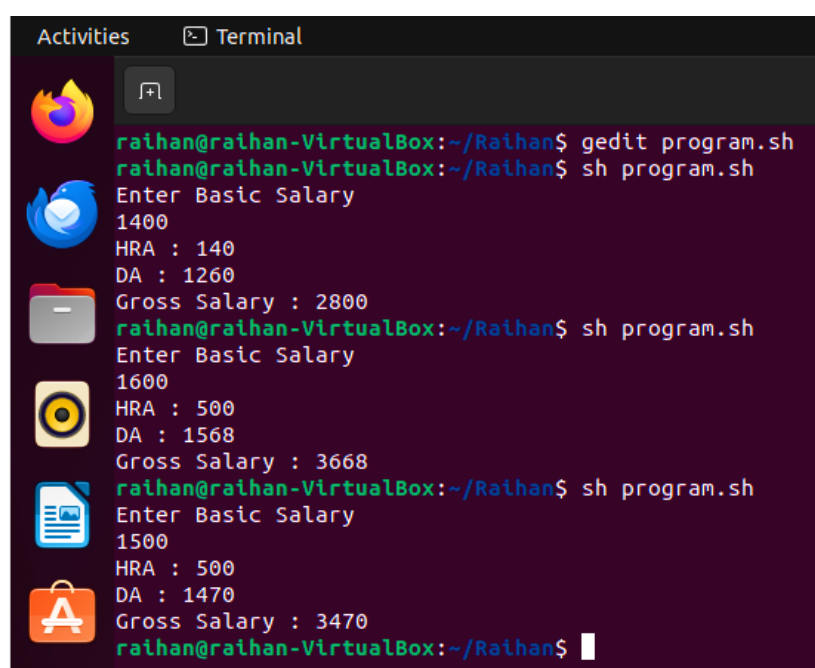
b) if basic salary is >=1500 then HRA=Rs 500 and DA=98% of basic

The basic salary is accepted from user



```
raihan@raihan-VirtualBox:~/Raihan$ gedit program.sh

1 echo "Enter Basic Salary"
2 read basic_salary
3
4 if test $basic_salary -lt 1500
5 then
6 HRA=`expr $basic_salary \* 10`
7 HRA=`expr $HRA \/ 100`
8 DA=`expr $basic_salary \* 90`
9 DA=`expr $DA \/ 100`
10 echo "HRA :" $HRA
11 echo "DA :" $DA
12 else
13 HRA=500
14 DA=`expr $basic_salary \* 98`
15 DA=`expr $DA \/ 100`
16 echo "HRA :" $HRA
17 echo "DA :" $DA
18 fi
19
20 gross_salary=`expr $basic_salary + $HRA + $DA`
21 echo "Gross Salary :" $gross_salary
```



```
raihan@raihan-VirtualBox:~/Raihan$ gedit program.sh
raihan@raihan-VirtualBox:~/Raihan$ sh program.sh
Enter Basic Salary
1400
HRA : 140
DA : 1260
Gross Salary : 2800
raihan@raihan-VirtualBox:~/Raihan$ sh program.sh
Enter Basic Salary
1600
HRA : 500
DA : 1568
Gross Salary : 3668
raihan@raihan-VirtualBox:~/Raihan$ sh program.sh
Enter Basic Salary
1500
HRA : 500
DA : 1470
Gross Salary : 3470
raihan@raihan-VirtualBox:~/Raihan$
```

**20 Write a shell script to calculate the grade of student. Take 5 subjects into consideration.**

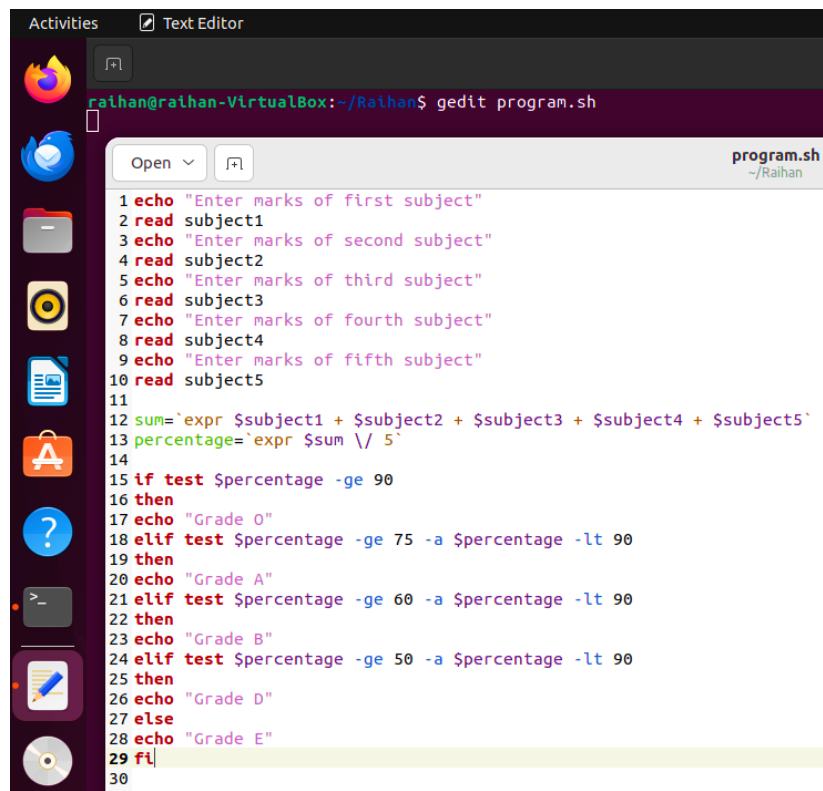
**Grade "O" if  $\geq 90\%$**

**Grade "A" if  $\geq 75\%$  but less than  $90\%$**

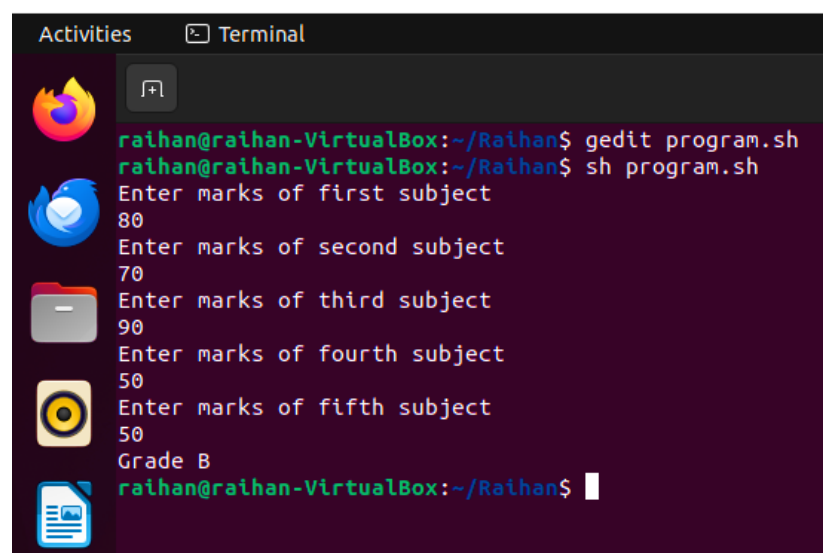
**Grade "B" if  $\geq 60\%$  but less than  $75\%$**

**Grade "D" if  $\geq 50\%$  but less than  $60\%$**

**Grade "E" if  $< 50\%$**

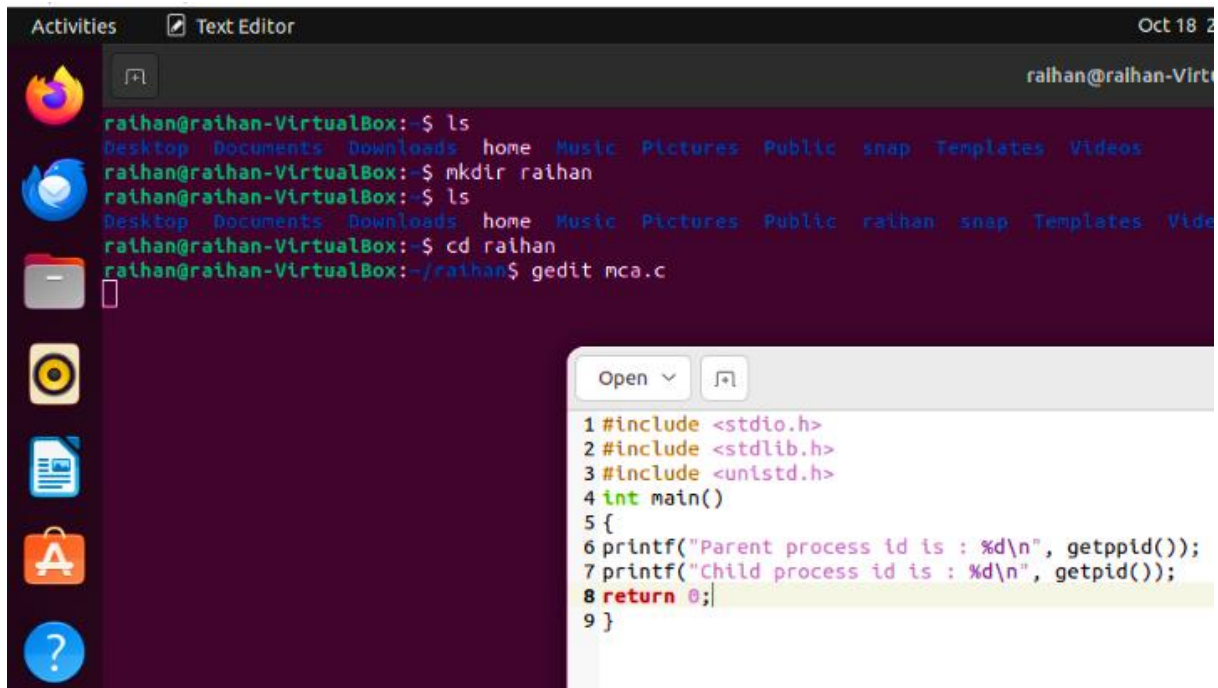


```
1 echo "Enter marks of first subject"
2 read subject1
3 echo "Enter marks of second subject"
4 read subject2
5 echo "Enter marks of third subject"
6 read subject3
7 echo "Enter marks of fourth subject"
8 read subject4
9 echo "Enter marks of fifth subject"
10 read subject5
11
12 sum=`expr $subject1 + $subject2 + $subject3 + $subject4 + $subject5`
13 percentage=`expr $sum \/ 5`
14
15 if test $percentage -ge 90
16 then
17     echo "Grade O"
18 elif test $percentage -ge 75 -a $percentage -lt 90
19 then
20     echo "Grade A"
21 elif test $percentage -ge 60 -a $percentage -lt 90
22 then
23     echo "Grade B"
24 elif test $percentage -ge 50 -a $percentage -lt 90
25 then
26     echo "Grade D"
27 else
28     echo "Grade E"
29 fi
30
```



```
raihan@raihan-VirtualBox:~/Raihan$ gedit program.sh
raihan@raihan-VirtualBox:~/Raihan$ sh program.sh
Enter marks of first subject
80
Enter marks of second subject
70
Enter marks of third subject
90
Enter marks of fourth subject
50
Enter marks of fifth subject
50
Grade B
raihan@raihan-VirtualBox:~/Raihan$
```

## 21 WAP to print the Parent and Child process id in c and run it in Linux terminal

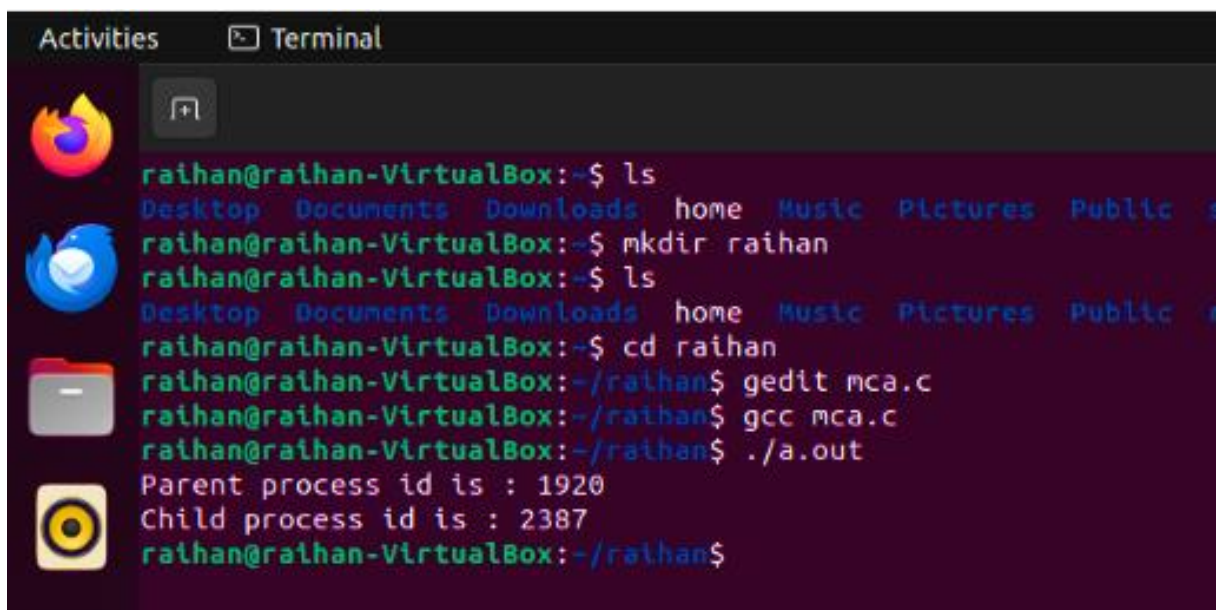


The screenshot shows a Linux desktop environment with a terminal window and a text editor. The terminal window displays the following commands and output:

```
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public snap Templates Videos
raihan@raihan-VirtualBox:~$ mkdir raihan
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public raihan snap Templates Videos
raihan@raihan-VirtualBox:~$ cd raihan
raihan@raihan-VirtualBox:~/raihan$ gedit mca.c
```

The text editor window shows the content of the file `mca.c`:

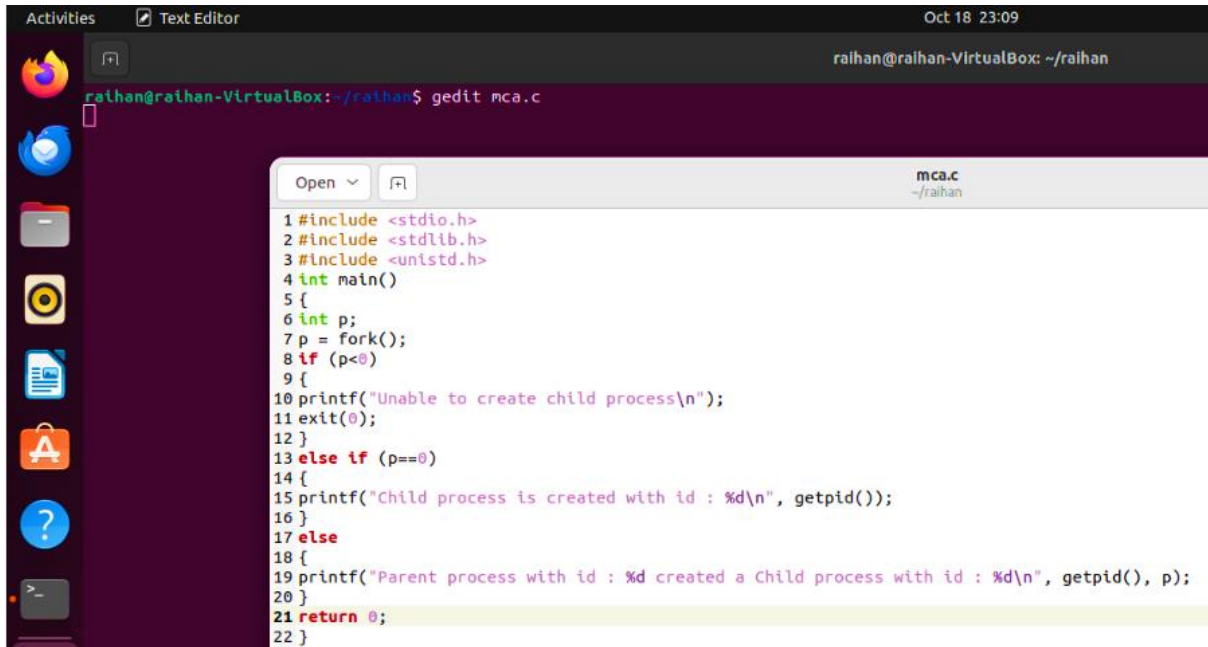
```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <unistd.h>
4 int main()
5 {
6     printf("Parent process id is : %d\n", getppid());
7     printf("Child process id is : %d\n", getpid());
8     return 0;
9 }
```



The screenshot shows a Linux desktop environment with a terminal window. The terminal window displays the following commands and output:

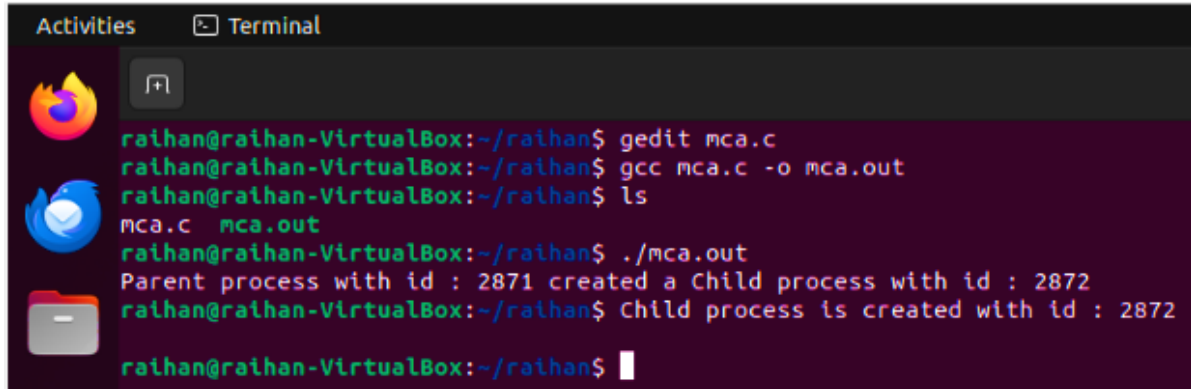
```
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ mkdir raihan
raihan@raihan-VirtualBox:~$ ls
Desktop Documents Downloads home Music Pictures Public
raihan@raihan-VirtualBox:~$ cd raihan
raihan@raihan-VirtualBox:~/raihan$ gedit mca.c
raihan@raihan-VirtualBox:~/raihan$ gcc mca.c
raihan@raihan-VirtualBox:~/raihan$ ./a.out
Parent process id is : 1920
Child process id is : 2387
raihan@raihan-VirtualBox:~/raihan$
```

**22 WAP to create a process and check whether the process is created or not using if else statements**



The screenshot shows a text editor window titled 'mca.c' with the following C code:

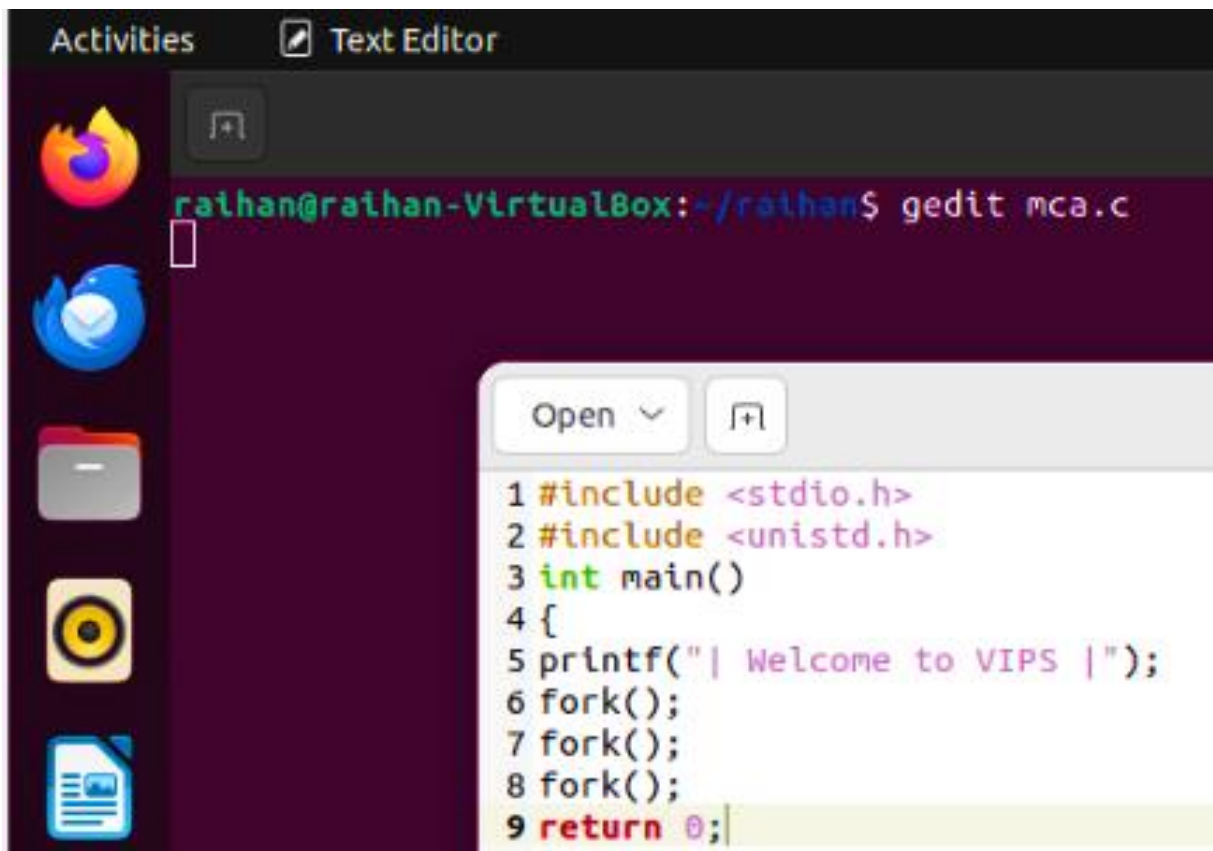
```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <unistd.h>
4 int main()
5 {
6     int p;
7     p = fork();
8     if (p<0)
9     {
10 printf("Unable to create child process\n");
11 exit(0);
12 }
13 else if (p==0)
14 {
15 printf("Child process is created with id : %d\n", getpid());
16 }
17 else
18 {
19 printf("Parent process with id : %d created a Child process with id : %d\n", getpid(), p);
20 }
21 return 0;
22 }
```



The screenshot shows a terminal window with the following commands and output:

```
rathan@rathan-VirtualBox:~/rathan$ gedit mca.c
rathan@rathan-VirtualBox:~/rathan$ gcc mca.c -o mca.out
rathan@rathan-VirtualBox:~/rathan$ ls
mca.c  mca.out
rathan@rathan-VirtualBox:~/rathan$ ./mca.out
Parent process with id : 2871 created a Child process with id : 2872
rathan@rathan-VirtualBox:~/rathan$ Child process is created with id : 2872
rathan@rathan-VirtualBox:~/rathan$
```

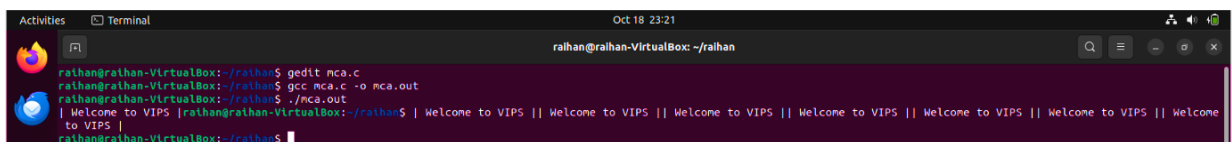
## 23 Create a nested process using fork() command



The screenshot shows a Linux desktop environment. On the left is a vertical dock with icons for Firefox, a mail client, a file manager, a music player, and a document. The main area contains two windows. The top window is a terminal titled 'Activities' with the prompt 'raihan@raihan-VirtualBox: ~/raihan\$'. It shows the command 'gedit mca.c' being entered. The bottom window is a text editor titled 'Text Editor' showing the contents of 'mca.c'.

```
raihan@raihan-VirtualBox: ~/raihan$ gedit mca.c
```

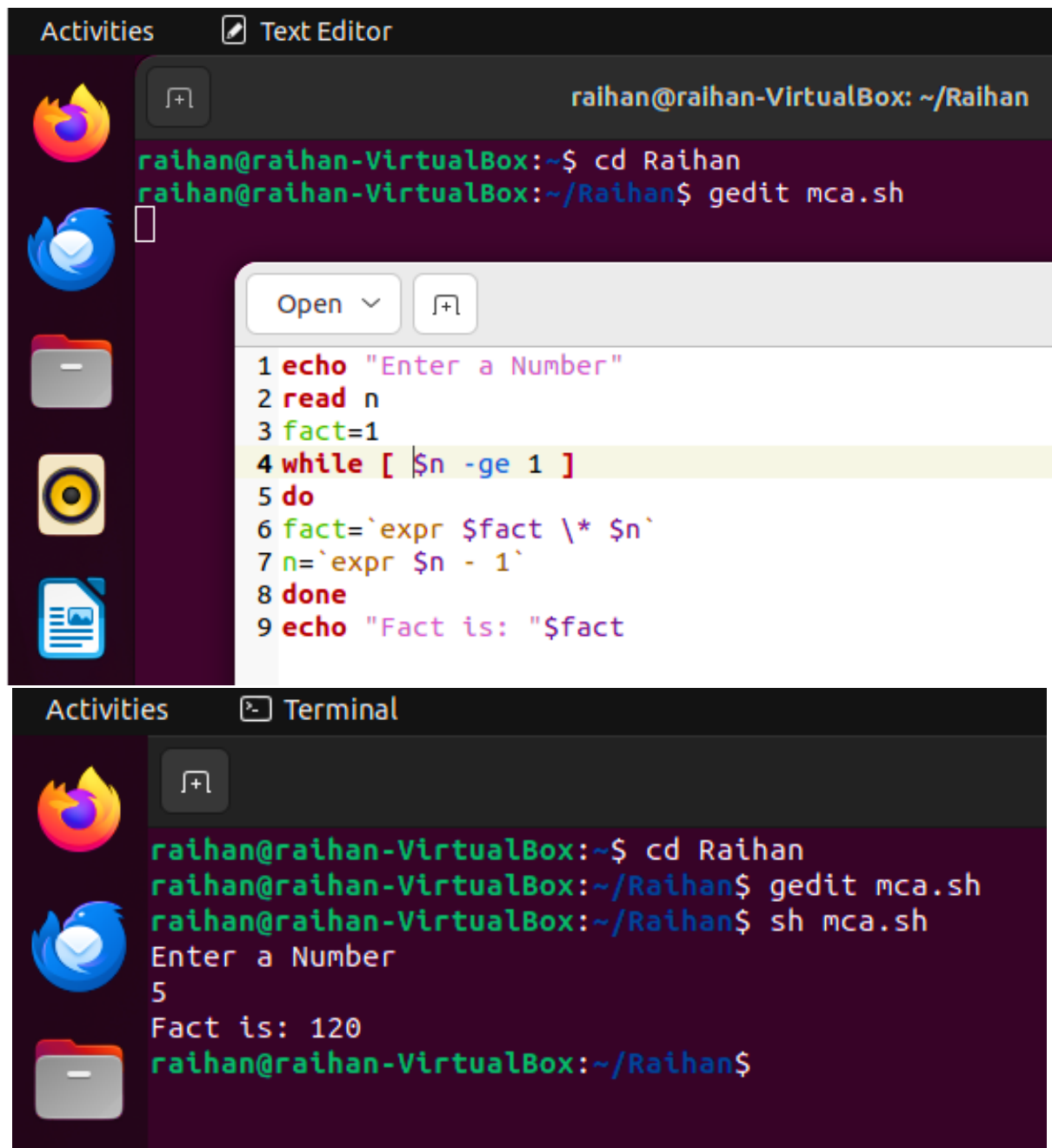
```
1 #include <stdio.h>
2 #include <unistd.h>
3 int main()
4 {
5     printf("| Welcome to VIPS |");
6     fork();
7     fork();
8     fork();
9     return 0;
```



The screenshot shows a terminal window titled 'Terminal' with the date 'Oct 18 23:21' and the user 'raihan@raihan-VirtualBox: ~/raihan'. It shows the execution of the program 'mca.out' which prints the message '| Welcome to VIPS |' multiple times, demonstrating the effect of the nested fork() calls.

```
raihan@raihan-VirtualBox: ~/raihan$ gedit mca.c
raihan@raihan-VirtualBox: ~/raihan$ gcc mca.c -o mca.out
raihan@raihan-VirtualBox: ~/raihan$ ./mca.out
| Welcome to VIPS |raihan@raihan-VirtualBox: ~/raihan$ | Welcome to VIPS || Welcome to VIPS || Welcome to VIPS || Welcome to VIPS || Welcome to VIPS || Welcome to VIPS || Welcome
to VIPS |
raihan@raihan-VirtualBox: ~/raihan$
```

## 24 WAP factorial of a number



The image consists of two screenshots of a Linux terminal window, likely running on a virtual machine named 'raihan-VirtualBox'.

The top screenshot shows the terminal with the following commands and output:

```
raihan@raihan-VirtualBox:~$ cd Raihan
raihan@raihan-VirtualBox:~/Raihan$ gedit mca.sh
```

A text editor window titled 'raihan@raihan-VirtualBox: ~/Raihan' is open, displaying the following shell script code:

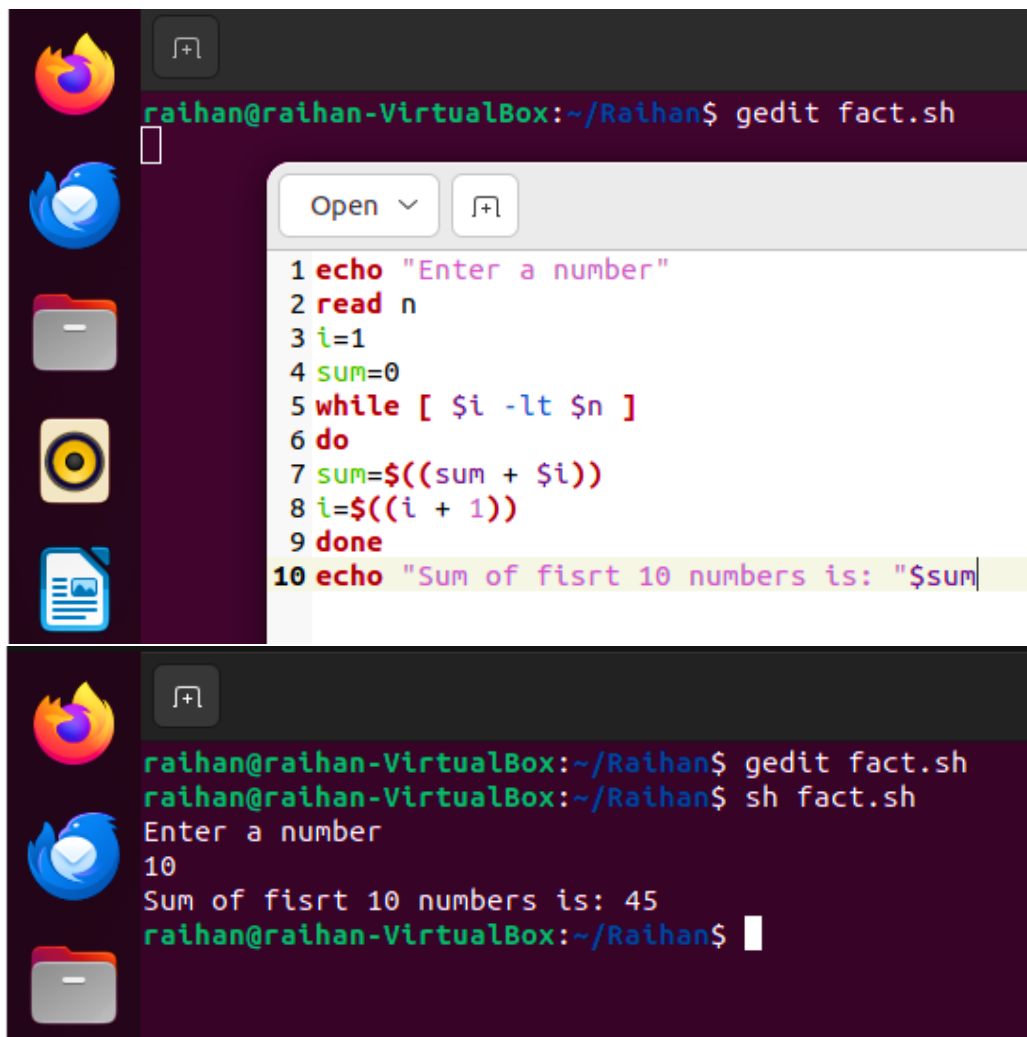
```
1 echo "Enter a Number"
2 read n
3 fact=1
4 while [ $n -ge 1 ]
5 do
6 fact=`expr $fact \* $n`
7 n=`expr $n - 1`
8 done
9 echo "Fact is: "$fact
```

The bottom screenshot shows the terminal with the following commands and output:

```
raihan@raihan-VirtualBox:~$ cd Raihan
raihan@raihan-VirtualBox:~/Raihan$ gedit mca.sh
raihan@raihan-VirtualBox:~/Raihan$ sh mca.sh
Enter a Number
5
Fact is: 120
raihan@raihan-VirtualBox:~/Raihan$
```



25 WAP sum of first 10 natural numbers.



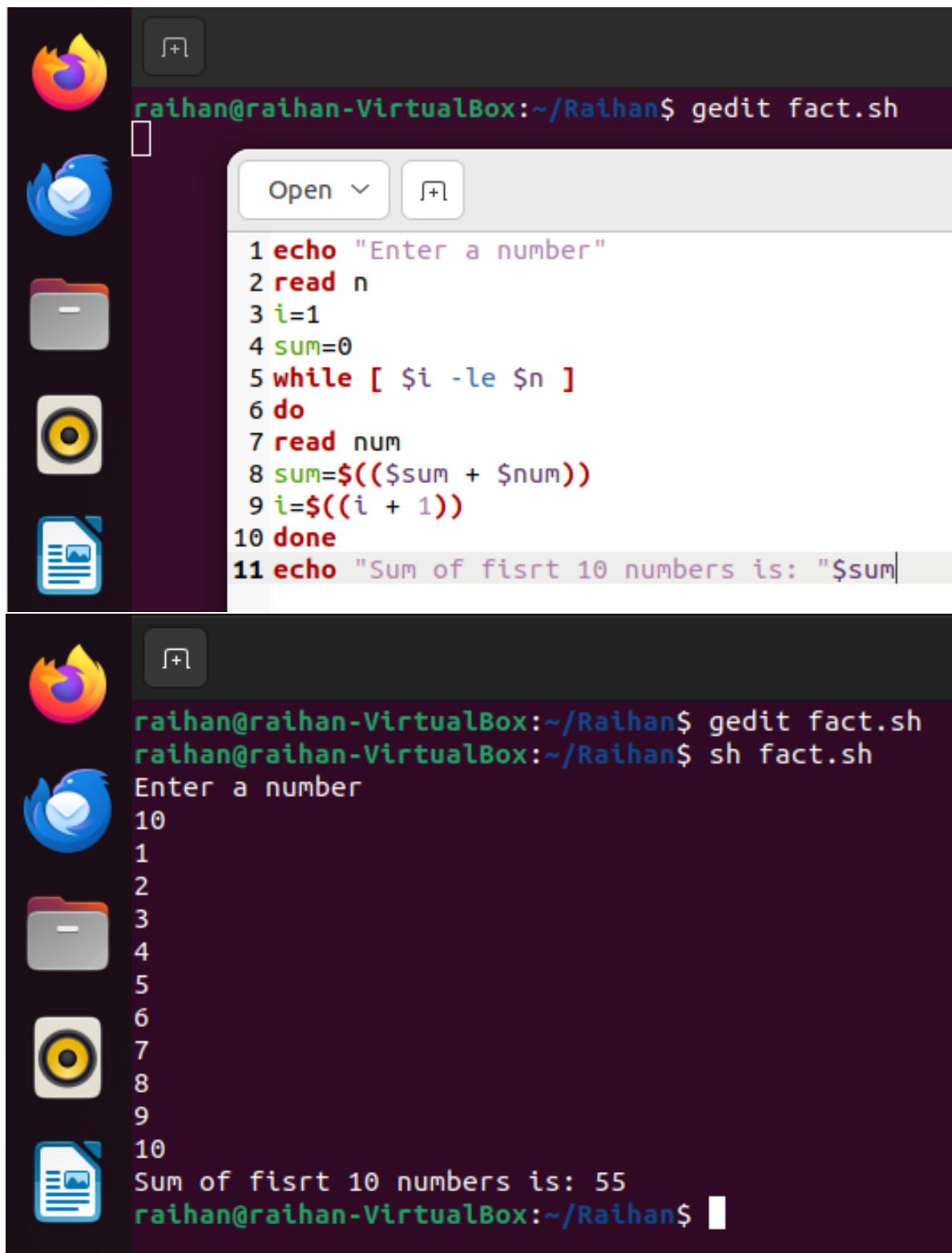
The image shows two screenshots of a terminal window on a Linux system. The top screenshot shows the user creating a file named `fact.sh` using the `gedit` editor. The file contains a shell script that prompts the user to enter a number, reads the input, and calculates the sum of the first 10 natural numbers using a `while` loop. The bottom screenshot shows the user running the script with `sh fact.sh`, entering the number 10, and receiving the output: "Sum of first 10 numbers is: 45".

```
raihan@raihan-VirtualBox:~/Raihan$ gedit fact.sh
1 echo "Enter a number"
2 read n
3 i=1
4 sum=0
5 while [ $i -lt $n ]
6 do
7 sum=$((sum + $i))
8 i=$((i + 1))
9 done
10 echo "Sum of first 10 numbers is: "$sum

raihan@raihan-VirtualBox:~/Raihan$ gedit fact.sh
raihan@raihan-VirtualBox:~/Raihan$ sh fact.sh
Enter a number
10
Sum of first 10 numbers is: 45
raihan@raihan-VirtualBox:~/Raihan$
```



26 WAP sum of first 10 input value.



The image shows two screenshots of a Linux terminal window. The top screenshot shows the user editing a file named `fact.sh` using the `gedit` editor. The script contains the following code:

```
1 echo "Enter a number"
2 read n
3 i=1
4 sum=0
5 while [ $i -le $n ]
6 do
7 read num
8 sum=$((sum + $num))
9 i=$((i + 1))
10 done
11 echo "Sum of first 10 numbers is: "$sum
```

The bottom screenshot shows the user running the script with `sh fact.sh`. The terminal output is as follows:

```
raihan@raihan-VirtualBox:~/Raihan$ gedit fact.sh
raihan@raihan-VirtualBox:~/Raihan$ sh fact.sh
Enter a number
10
1
2
3
4
5
6
7
8
9
10
Sum of first 10 numbers is: 55
raihan@raihan-VirtualBox:~/Raihan$
```