2a. Consider the below scenarios and execute the given shell scripts.

"*Ramaiah College has 10 departments (Say, CS, IS, AI, ML, Cyber Security, EC, Mechanical, EEE, DS, Civil) with UG and PG programs, and in each of the programs student details, course details are maintained in 10 different files (such as Student Details, Course details, Curriculum, Exam, Marks, Research Activity, NBA, Placement Activities, Library Details, Extra Activities….)*."

Develop a shell script for the above scenario to create 10 levels of folders for the departments and inside each level(department) of the folder, create 10 files in each department for maintaining student details. Display the entire hierarchy on the standard output by using the tree command.

Note:- All these Shell script create in your own directory. Create a directory (ex- yourUSN) and save all these scripts inside it.

mkdir 1MS23CY099
cd 1MS23CY099

then follow the screenshots.

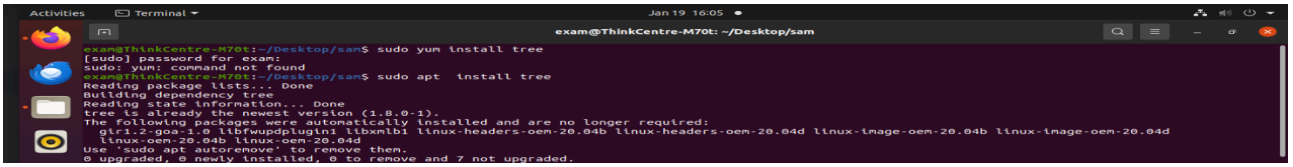
```
exam@ThinkCentre-M70t:~/Desktop/sam$ vi 2a.sh
exam@ThinkCentre-M70t:~/Desktop/sam$
```

Once the shell script is typed in the vi editor, Let us execute the script.

Output:-

```
exam@ThinkCentre-M70t:~/Desktop/sam$ vi 2a.sh
exam@ThinkCentre-M70t:~/Desktop/sam$ sh 2a.sh
10 levels of folders are created for the departments and 10 levels of files created for student details
exam@ThinkCentre-M70t:~/Desktop/sam$ ls
2a.sh  8.txt  MSRITDept1   MSRITDept2  MSRITDept4  MSRITDept6  MSRITDept8  t1
2b.sh  9.txt  MSRITDept10  MSRITDept3  MSRITDept5  MSRITDept7  MSRITDept9
exam@ThinkCentre-M70t:~/Desktop/sam$ cd MSRITDept1
exam@ThinkCentre-M70t:~/Desktop/sam/MSRITDept1$ ls
MSRITStudentDetails1   MSRITStudentDetails2  MSRITStudentDetails4  MSRITStudentDetails6  MSRITStudentDetails8
MSRITStudentDetails10  MSRITStudentDetails3  MSRITStudentDetails5  MSRITStudentDetails7  MSRITStudentDetails9
exam@ThinkCentre-M70t:~/Desktop/sam/MSRITDept1$ cd ..
exam@ThinkCentre-M70t:~/Desktop/sam$ cd MSRITDept2
exam@ThinkCentre-M70t:~/Desktop/sam/MSRITDept2$ ls
MSRITStudentDetails1   MSRITStudentDetails2  MSRITStudentDetails4  MSRITStudentDetails6  MSRITStudentDetails8
MSRITStudentDetails10  MSRITStudentDetails3  MSRITStudentDetails5  MSRITStudentDetails7  MSRITStudentDetails9
exam@ThinkCentre-M70t:~/Desktop/sam/MSRITDept2$
```

To install tree command:-



In this system, tree command is already installed. Now check the tree output

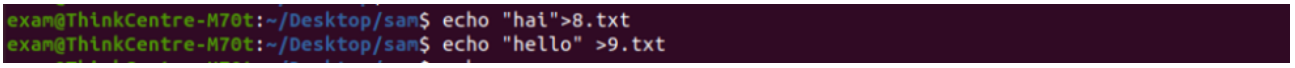
```
-rw-rw-r-- 1 exam exam   44 Jan 19 15:18 t1
exam@ThinkCentre-M70t:~/Desktop/sam$ tree
```

```
├── MSRITDept1
│   ├── MSRITStudentDetails1
│   ├── MSRITStudentDetails10
│   ├── MSRITStudentDetails2
│   ├── MSRITStudentDetails3
│   ├── MSRITStudentDetails4
│   ├── MSRITStudentDetails5
│   ├── MSRITStudentDetails6
│   ├── MSRITStudentDetails7
│   ├── MSRITStudentDetails8
│   └── MSRITStudentDetails9
├── MSRITDept10
│   ├── MSRITStudentDetails1
│   ├── MSRITStudentDetails10
│   ├── MSRITStudentDetails2
│   ├── MSRITStudentDetails3
│   ├── MSRITStudentDetails4
│   ├── MSRITStudentDetails5
│   ├── MSRITStudentDetails6
│   ├── MSRITStudentDetails7
│   ├── MSRITStudentDetails8
│   └── MSRITStudentDetails9
├── MSRITDept2
│   ├── MSRITStudentDetails1
│   ├── MSRITStudentDetails10
│   ├── MSRITStudentDetails2
│   ├── MSRITStudentDetails3
│   ├── MSRITStudentDetails4
│   ├── MSRITStudentDetails5
│   ├── MSRITStudentDetails6
│   ├── MSRITStudentDetails7
│   ├── MSRITStudentDetails8
│   └── MSRITStudentDetails9
├── MSRITDept3
│   ├── MSRITStudentDetails1
│   ├── MSRITStudentDetails10
│   ├── MSRITStudentDetails2
│   ├── MSRITStudentDetails3
│   ├── MSRITStudentDetails4
│   ├── MSRITStudentDetails5
│   ├── MSRITStudentDetails6
│   ├── MSRITStudentDetails7
│   ├── MSRITStudentDetails8
│   └── MSRITStudentDetails9
```

2b. Develop a shell script that accepts above created filename as argument & display its creation time and permissions of the file, on the standard output

vi 2b.sh

Now create files using below screenshot



Output:-

The above output displays field 1 (permissions), field 6,7,8(Modification time) and field 9(filename) of ls -l command.

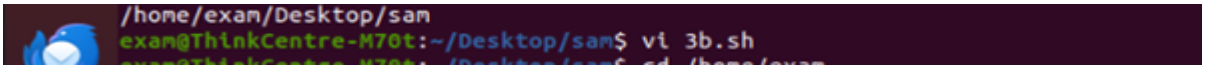
We are executing 2b.sh with an argument as 8.txt(file), to display the 1,6,7,8,9 field of the file 8.txt.

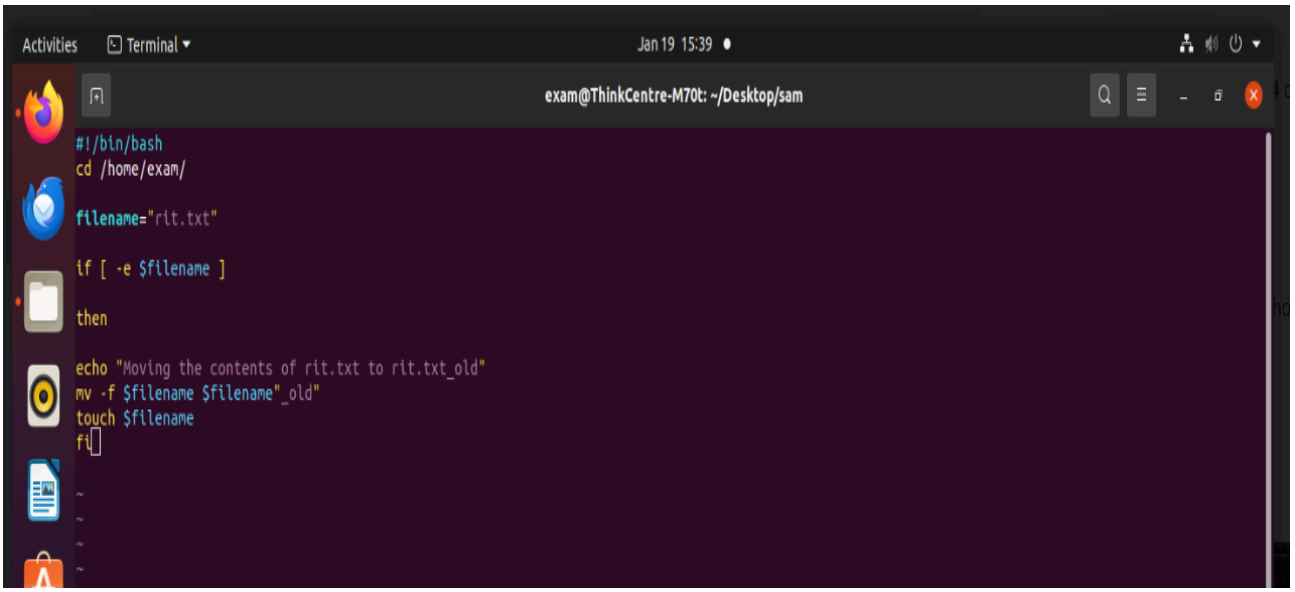
3a. Develop a shell script that takes a valid directory name as an argument and recursively descends all the sub-directories, finds the maximum length of any file in that hierarchy, and stores the output in a file.

Output:-
Here the directory sd is created, 2 files 1.txt and 2.txt are created. While executing 3a.sh, directory created sd is given as a argument. The output of the 3a.sh is larger filesize in a directory will be displayed.

```
exam@ThinkCentre-M70t:~/Desktop/sam$ mkdir sd
exam@ThinkCentre-M70t:~/Desktop/sam$ cd sd
exam@ThinkCentre-M70t:~/Desktop/sam/sd$ echo "haoi" >1.txt
exam@ThinkCentre-M70t:~/Desktop/sam/sd$ echo "Hellooo" >2.txt
exam@ThinkCentre-M70t:~/Desktop/sam/sd$ ls
1.txt  2.txt
exam@ThinkCentre-M70t:~/Desktop/sam/sd$ cd ..
exam@ThinkCentre-M70t:~/Desktop/sam$ sh 3a.sh sd
Large filename size is
5 8
```

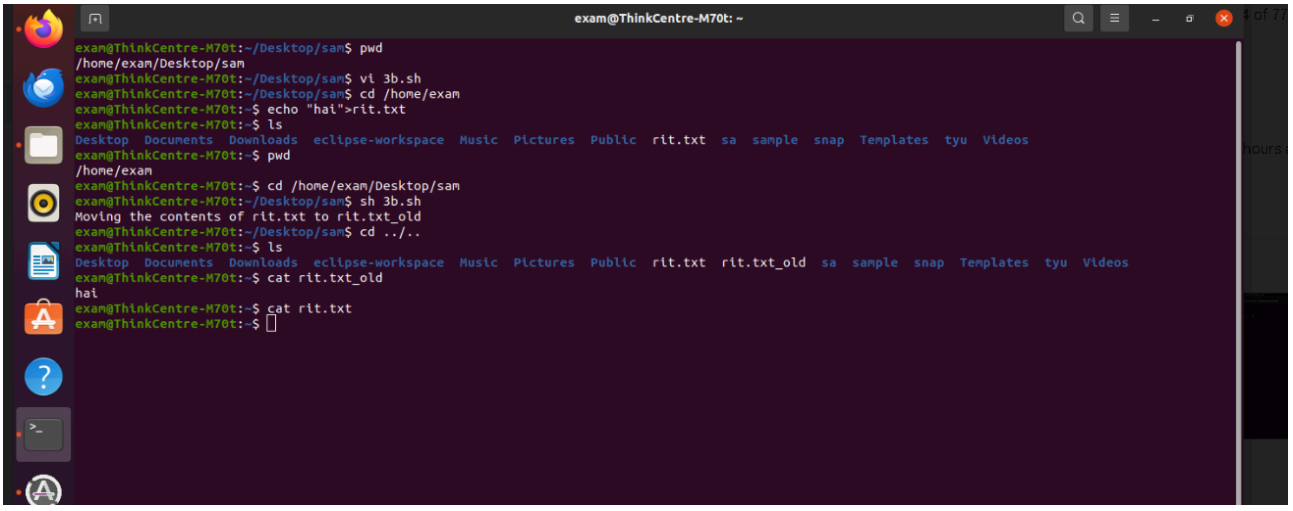
3b. Create a shell script to find a file with particular name, (show separate outputs for both the conditions)
i) if that file exists then rename the existing file and create an empty file with that name.



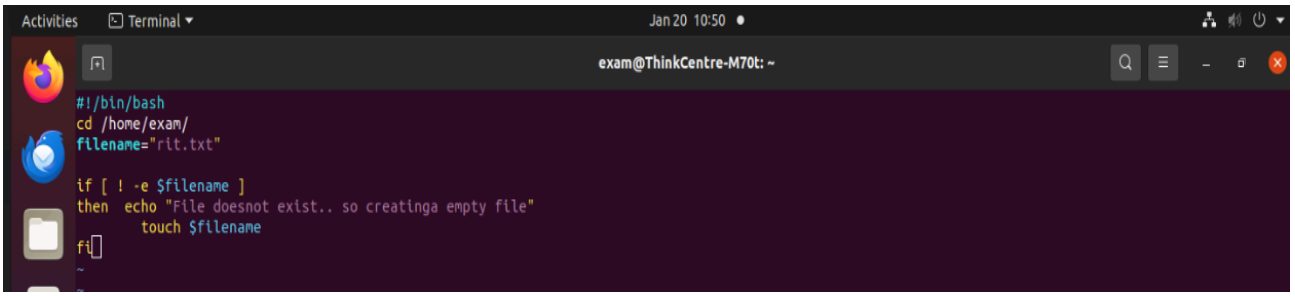


Output:-

Before executing 3b.sh, create a file called rit.txt with some contents in it, then execute the shell script.



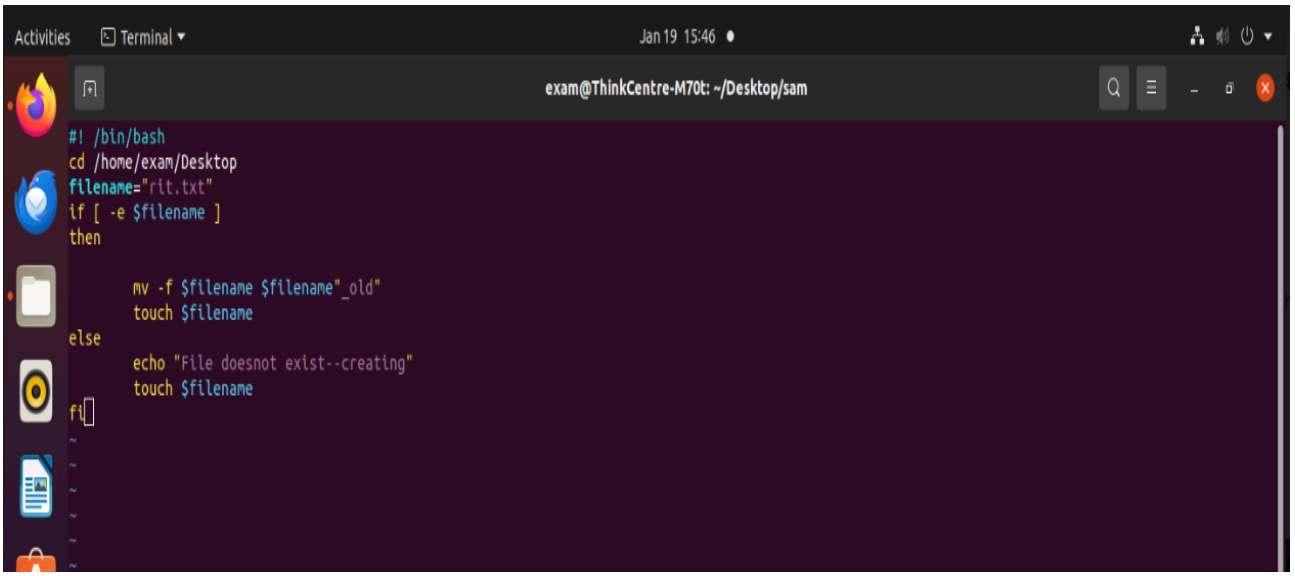
ii) if that file does not exist then create a new empty file.



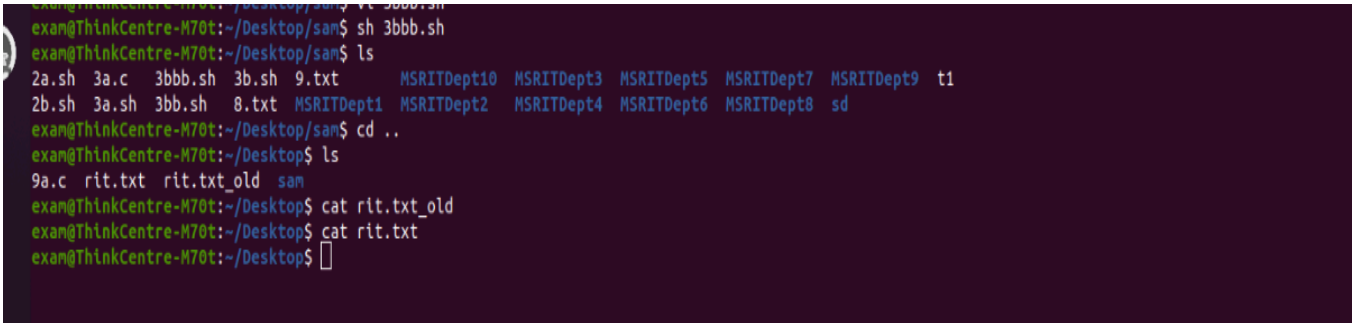
Output:-

Here if the file rit.txt doesnot exist, it will create an empty rit.txt file.

iii) Both conditions together(if and else conditions together)



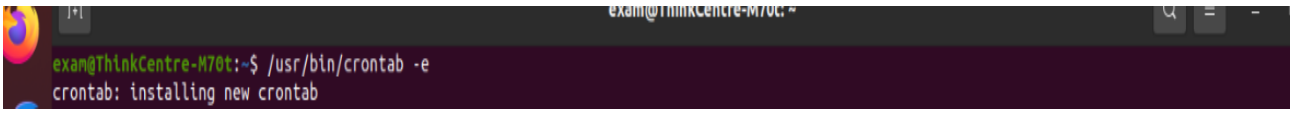
Output:



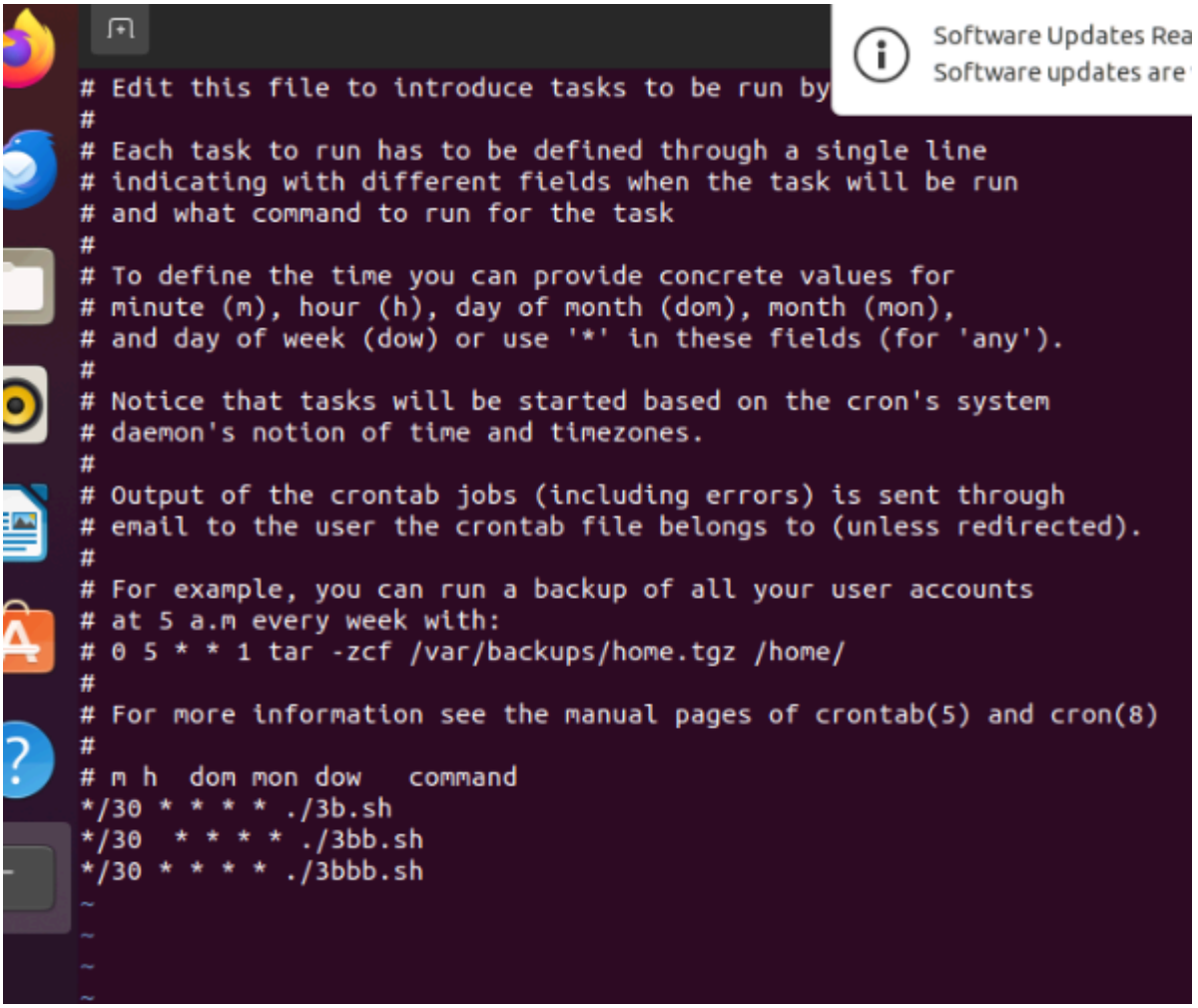
3.c. Set up a cron job for the above developed scripts, , that will be execute after every 30 minutes

The Cron software utility is a time-based job scheduler in Unix-like operating systems. Cron allows Linux and Unix users to run commands or scripts at a given time and date.

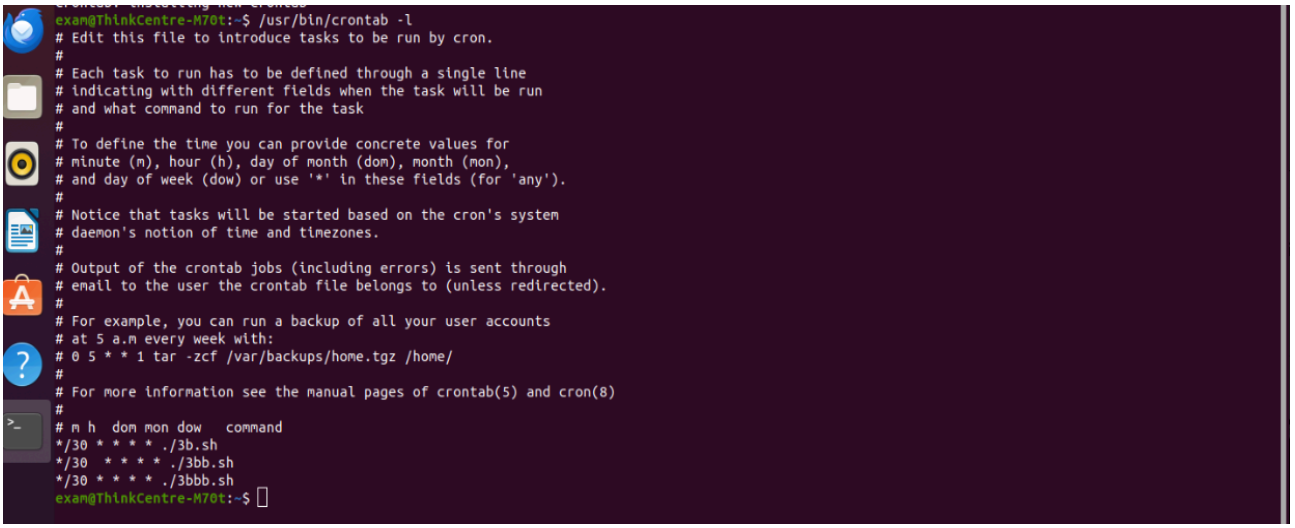
Setting a cronjob



Once we type the above command /usr/bin/crontab -e, one more window will open , there schedule your jobs. Which is shown in below screenshot(in last 3 lines). We are trying to schedule 3 jobs(executing 3b.sh,3bb.sh and 3bbb.sh script every 30 minutes)

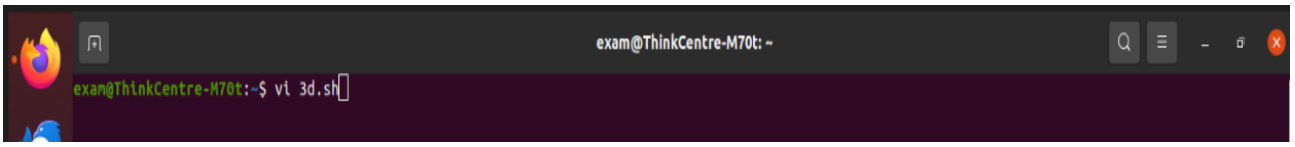


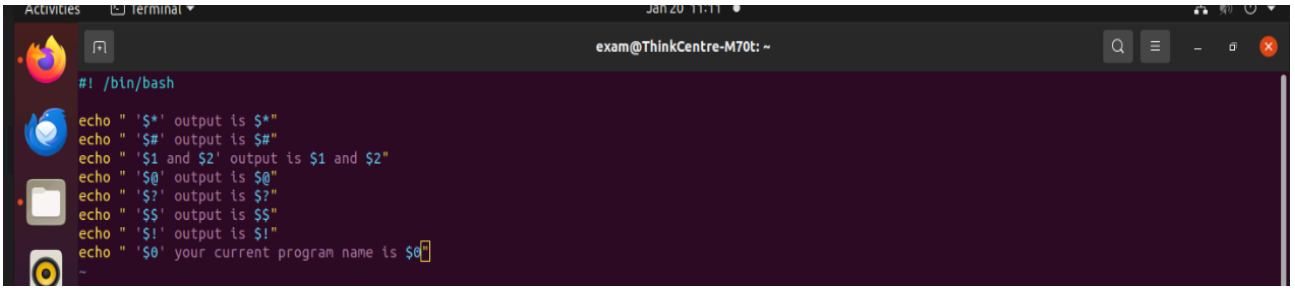
Listing out cronjobs:-



You can observe last 3 lines 3 jobs are set for 3b.sh, 3bb.sh and 3bbb.sh

3d. Illustrating shell variables in a shell script





Output:-

The script 3d.sh is executed with some arguments.