

Operating Systems assignment

Name: Prabhat Vitthal Shinde

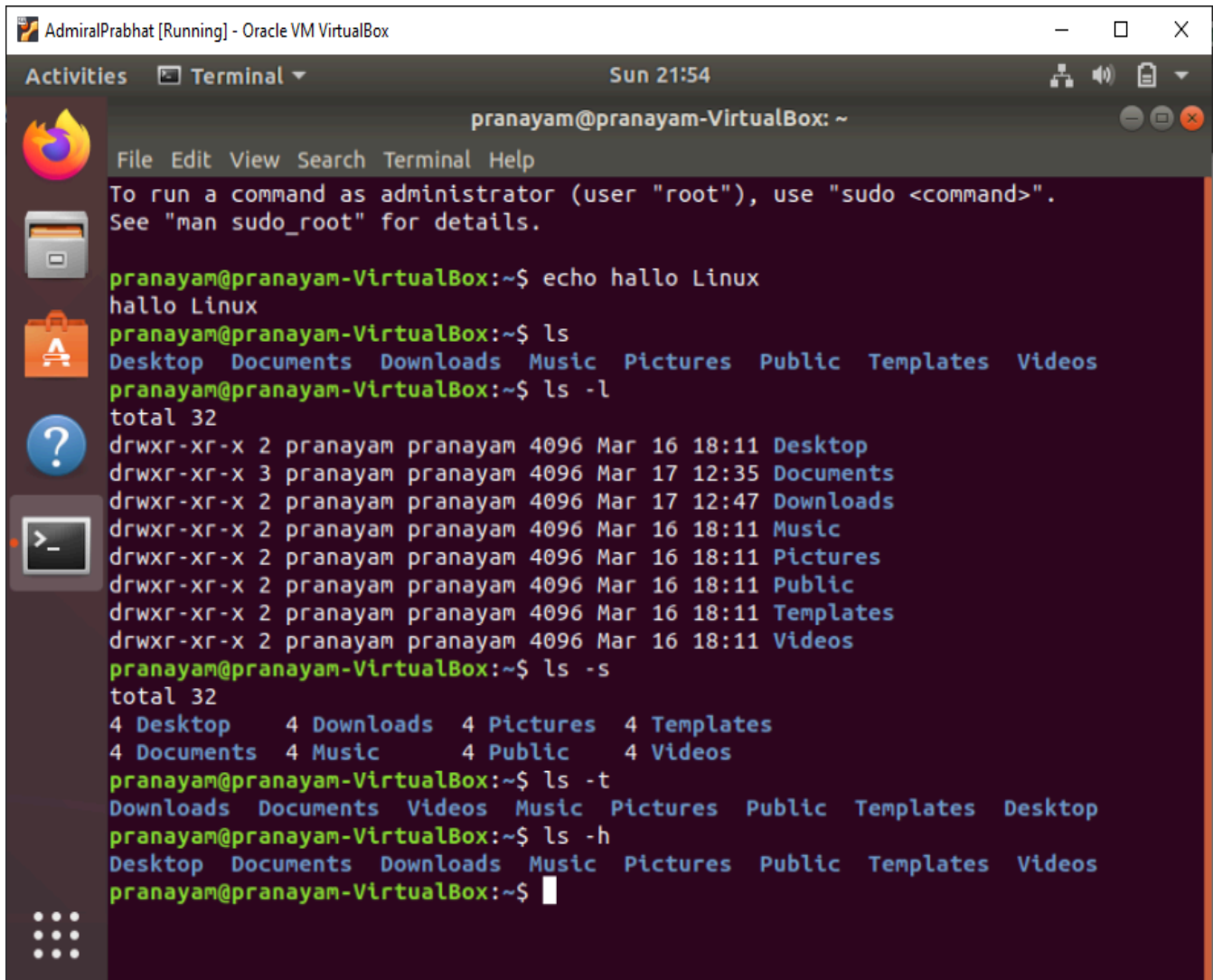
Program: Capacity Building Program (CBP)

Roll Number: 55

Date: 16th March 2024.

1: Introduction to LINUX commands:

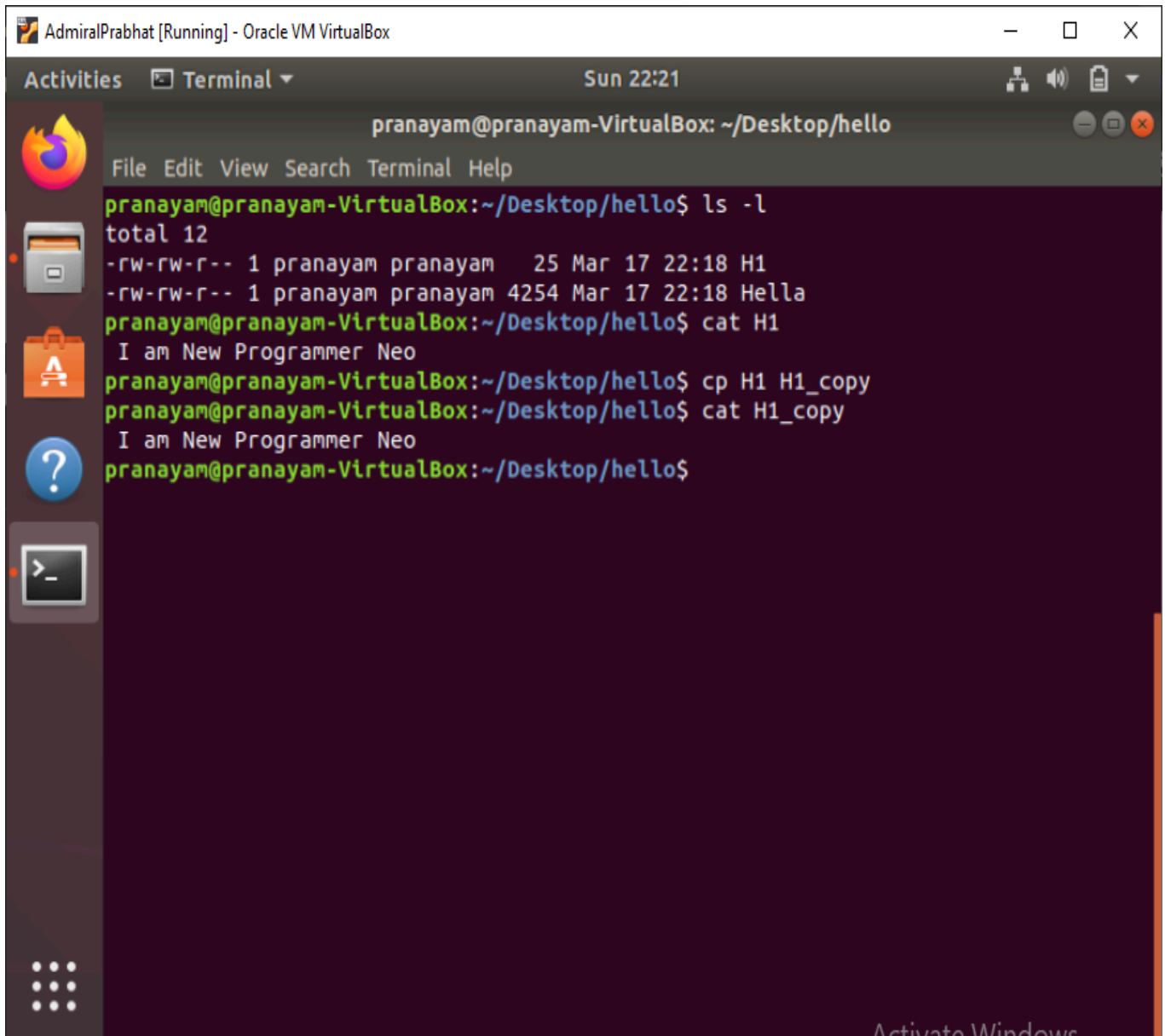
1: ls - lists all files and directories in a directory.



```
AdmiralPrabhat [Running] - Oracle VM VirtualBox
Sun 21:54
pranayam@pranayam-VirtualBox: ~
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

pranayam@pranayam-VirtualBox:~$ echo hallo Linux
hallo Linux
pranayam@pranayam-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
pranayam@pranayam-VirtualBox:~$ ls -l
total 32
drwxr-xr-x 2 pranayam pranayam 4096 Mar 16 18:11 Desktop
drwxr-xr-x 3 pranayam pranayam 4096 Mar 17 12:35 Documents
drwxr-xr-x 2 pranayam pranayam 4096 Mar 17 12:47 Downloads
drwxr-xr-x 2 pranayam pranayam 4096 Mar 16 18:11 Music
drwxr-xr-x 2 pranayam pranayam 4096 Mar 16 18:11 Pictures
drwxr-xr-x 2 pranayam pranayam 4096 Mar 16 18:11 Public
drwxr-xr-x 2 pranayam pranayam 4096 Mar 16 18:11 Templates
drwxr-xr-x 2 pranayam pranayam 4096 Mar 16 18:11 Videos
pranayam@pranayam-VirtualBox:~$ ls -s
total 32
4 Desktop      4 Downloads   4 Pictures    4 Templates
4 Documents    4 Music       4 Public      4 Videos
pranayam@pranayam-VirtualBox:~$ ls -t
Downloads Documents Videos Music Pictures Public Templates Desktop
pranayam@pranayam-VirtualBox:~$ ls -h
Desktop Documents Downloads Music Pictures Public Templates Videos
pranayam@pranayam-VirtualBox:~$
```

2: cp - copy files or directories to current or another directory.

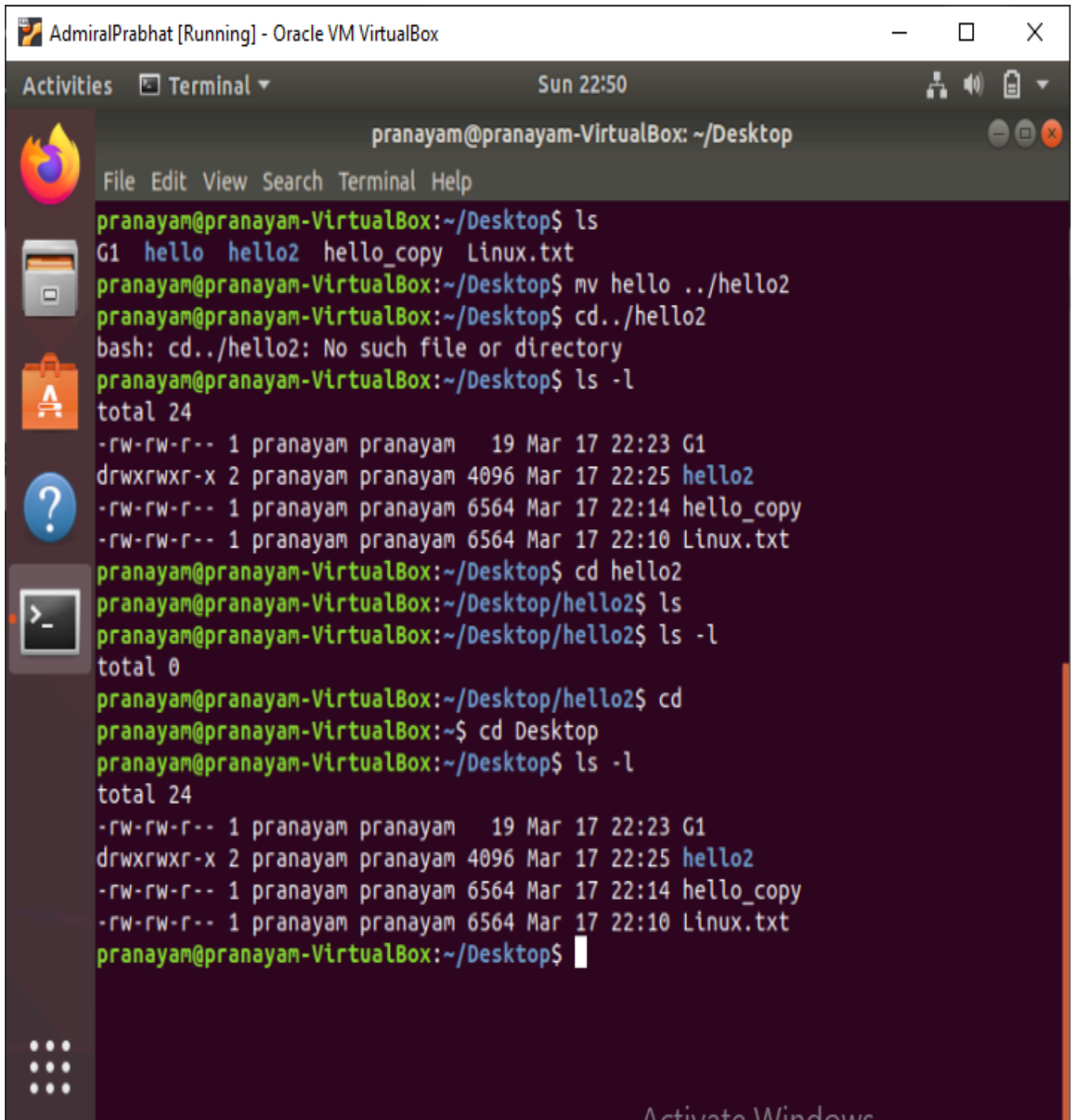


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" in the directory "~/Desktop/hello". The terminal output shows the following commands and results:

```
pranayam@pranayam-VirtualBox: ~/Desktop/hello
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~/Desktop/hello$ ls -l
total 12
-rw-rw-r-- 1 pranayam pranayam 25 Mar 17 22:18 H1
-rw-rw-r-- 1 pranayam pranayam 4254 Mar 17 22:18 Hella
pranayam@pranayam-VirtualBox:~/Desktop/hello$ cat H1
I am New Programmer Neo
pranayam@pranayam-VirtualBox:~/Desktop/hello$ cp H1 H1_copy
pranayam@pranayam-VirtualBox:~/Desktop/hello$ cat H1_copy
I am New Programmer Neo
pranayam@pranayam-VirtualBox:~/Desktop/hello$
```

The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The left sidebar shows icons for Firefox, a file manager, a shopping bag, a question mark, and a terminal icon. The bottom right corner of the window has a watermark that says "Activate Windows".

3: mv - move and rename files.

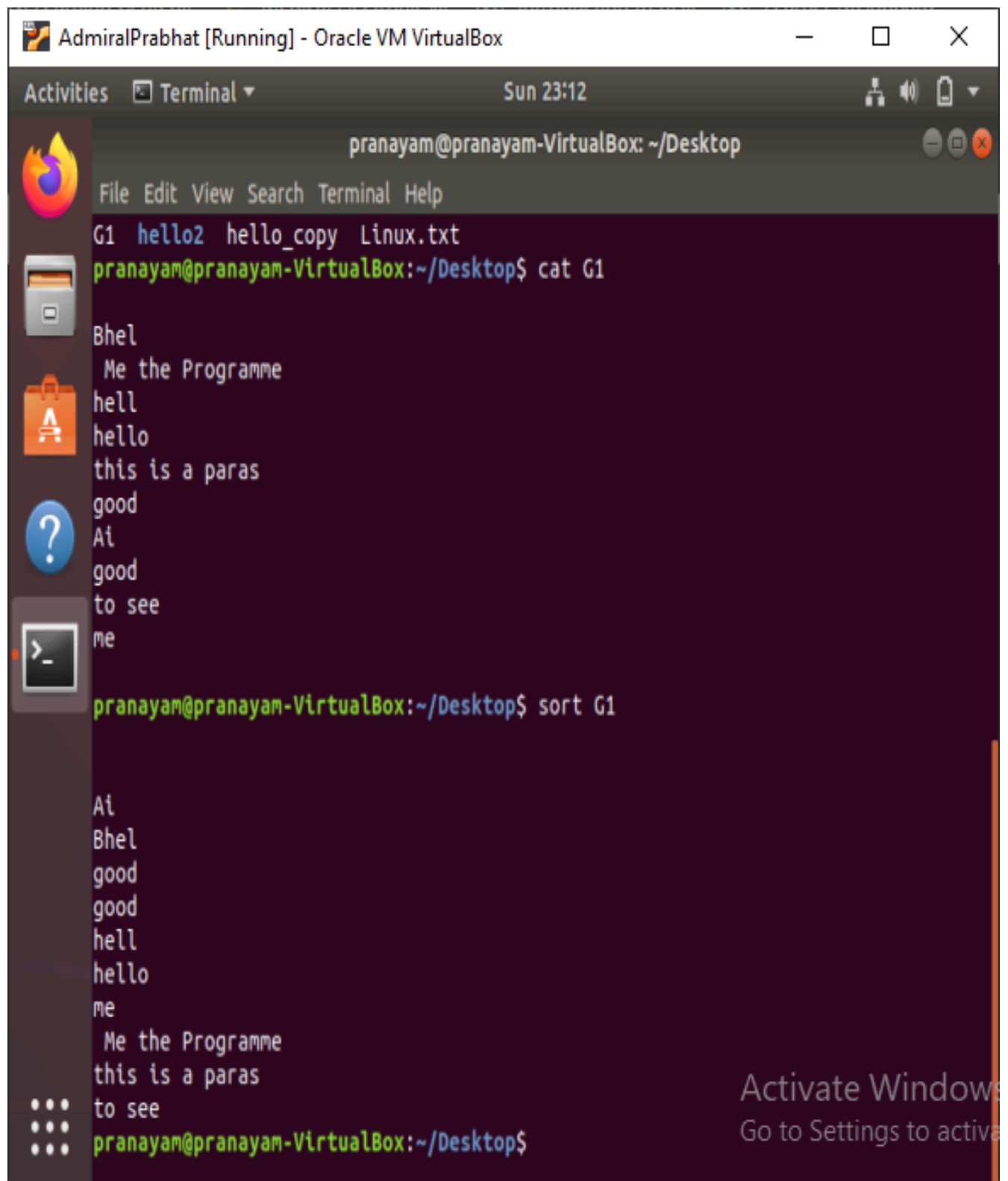


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running a Linux environment with the user "pranayam" at the "pranayam-VirtualBox" host, in the directory "~/Desktop". The terminal output shows the following commands and results:

```
pranayam@pranayam-VirtualBox: ~/Desktop
ls
G1 hello hello2 hello_copy Linux.txt
mv hello ../hello2
cd ../hello2
bash: cd ../hello2: No such file or directory
ls -l
total 24
-rw-rw-r-- 1 pranayam pranayam 19 Mar 17 22:23 G1
drwxrwxr-x 2 pranayam pranayam 4096 Mar 17 22:25 hello2
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:14 hello_copy
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:10 Linux.txt
cd hello2
ls
ls -l
total 0
cd
cd Desktop
ls -l
total 24
-rw-rw-r-- 1 pranayam pranayam 19 Mar 17 22:23 G1
drwxrwxr-x 2 pranayam pranayam 4096 Mar 17 22:25 hello2
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:14 hello_copy
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:10 Linux.txt
pranayam@pranayam-VirtualBox: ~/Desktop$
```

The terminal window includes a sidebar with icons for Activities, Terminal, and a search bar. The top bar shows the time as "Sun 22:50". The bottom right corner of the window has a watermark that says "Activate Windows".

5: sort - sort lines in a text file.

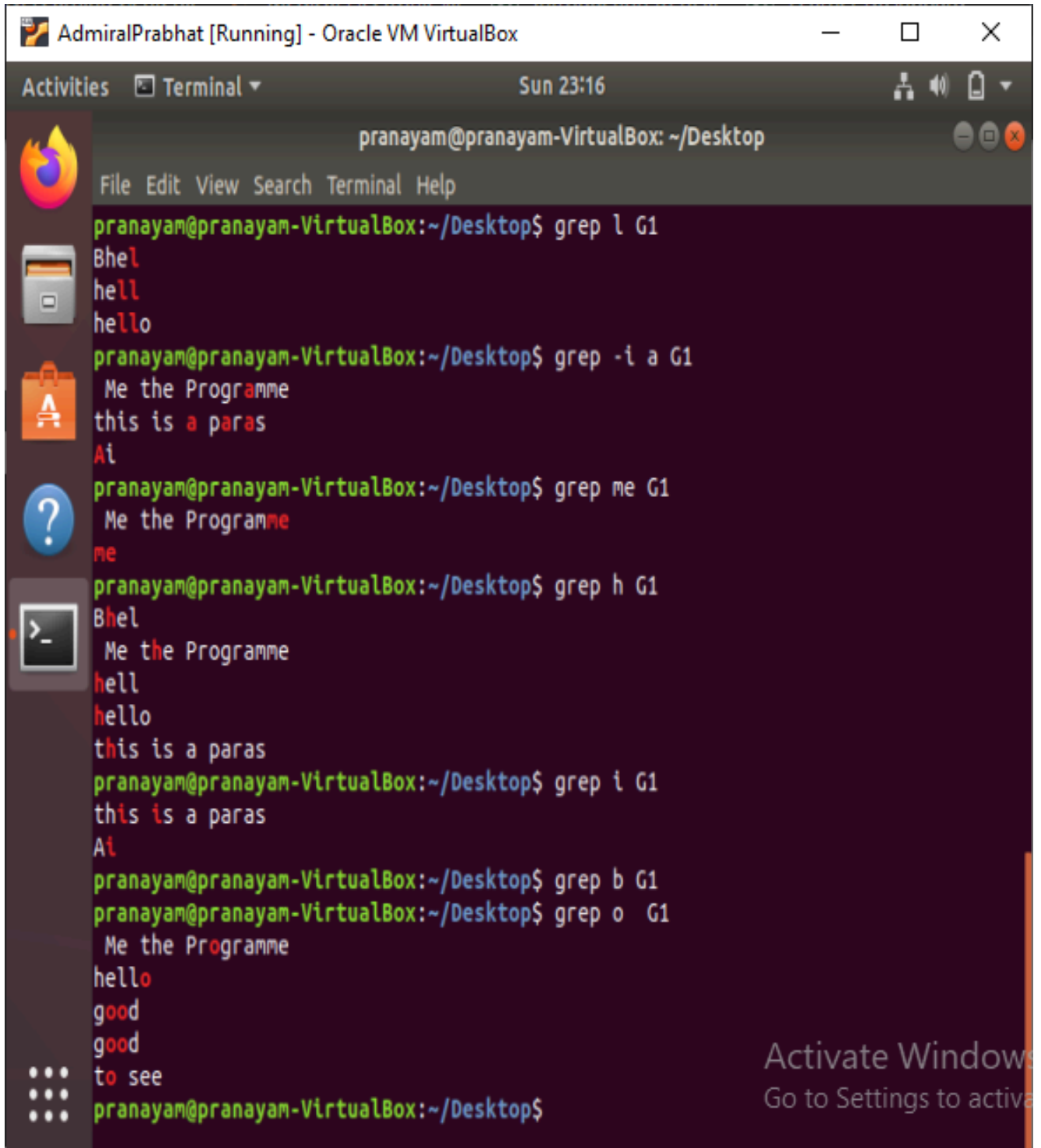


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" in the directory "~/Desktop". The terminal output shows the following sequence of commands and results:

```
pranayam@pranayam-VirtualBox: ~/Desktop
G1 hello2 hello_copy Linux.txt
pranayam@pranayam-VirtualBox:~/Desktop$ cat G1
Bhel
  Me the Programme
hell
hello
this is a paras
good
Ai
good
to see
me
pranayam@pranayam-VirtualBox:~/Desktop$ sort G1
Ai
Bhel
good
good
hell
hello
me
  Me the Programme
this is a paras
to see
pranayam@pranayam-VirtualBox:~/Desktop$
```

The left sidebar of the terminal window contains icons for various applications: Firefox, a file manager, a shopping bag, a question mark, and a terminal icon. The bottom right corner of the window displays the text "Activate Windows Go to Settings to activate Windows".

6: grep - print lines that matches a pattern (Note: the pattern can be a regular expression)



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The terminal output shows several grep commands and their results:

```
pranayam@pranayam-VirtualBox:~/Desktop$ grep l G1
Bhel
hell
hello

pranayam@pranayam-VirtualBox:~/Desktop$ grep -i a G1
Me the Programme
this is a paras
Ai

pranayam@pranayam-VirtualBox:~/Desktop$ grep me G1
Me the Programme
me

pranayam@pranayam-VirtualBox:~/Desktop$ grep h G1
Bhel
Me the Programme
hell
hello
this is a paras

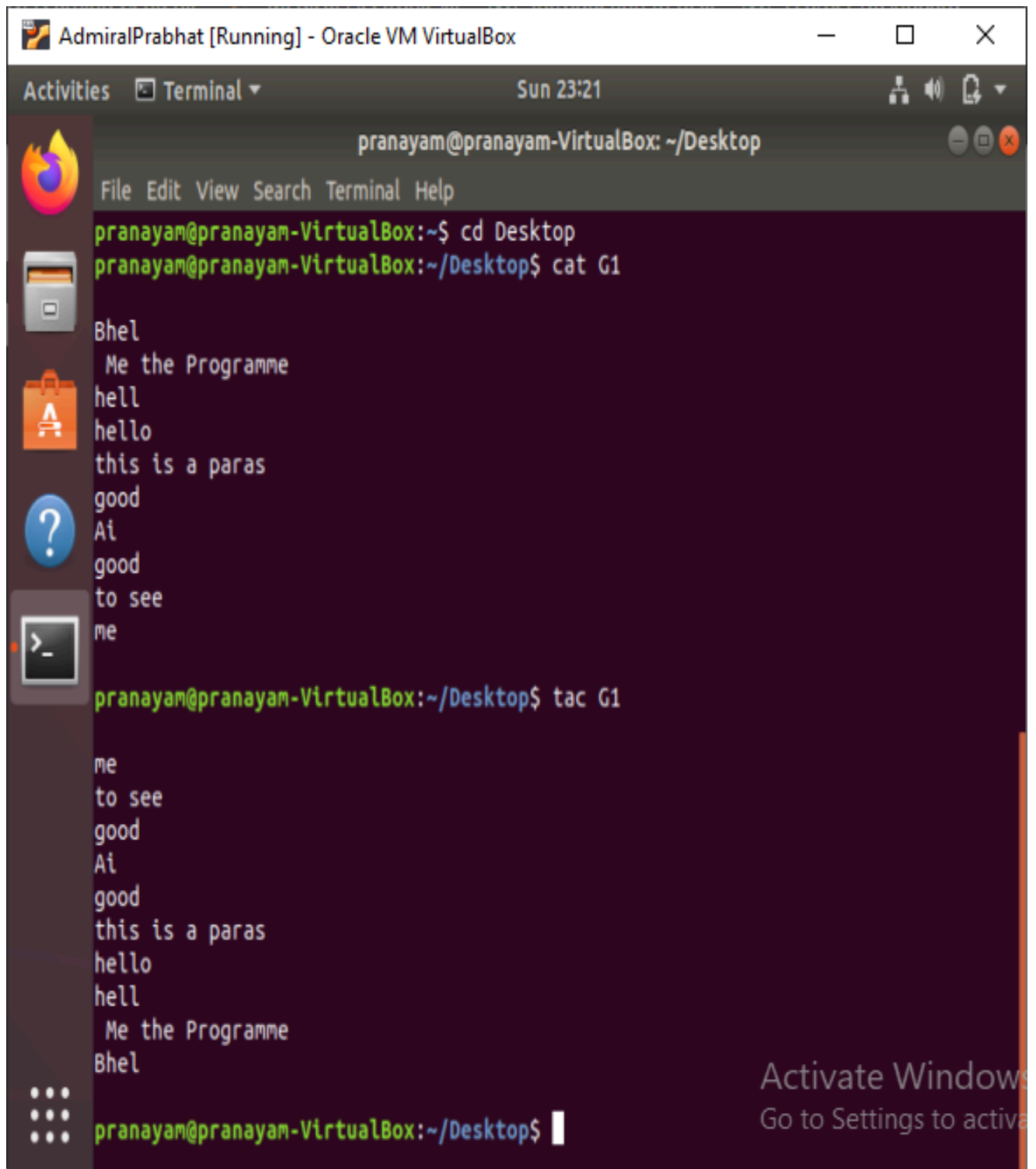
pranayam@pranayam-VirtualBox:~/Desktop$ grep i G1
this is a paras
Ai

pranayam@pranayam-VirtualBox:~/Desktop$ grep b G1
pranayam@pranayam-VirtualBox:~/Desktop$ grep o G1
Me the Programme
hello
good
good
to see

pranayam@pranayam-VirtualBox:~/Desktop$
```

An "Activate Windows" watermark is visible in the bottom right corner of the terminal window.

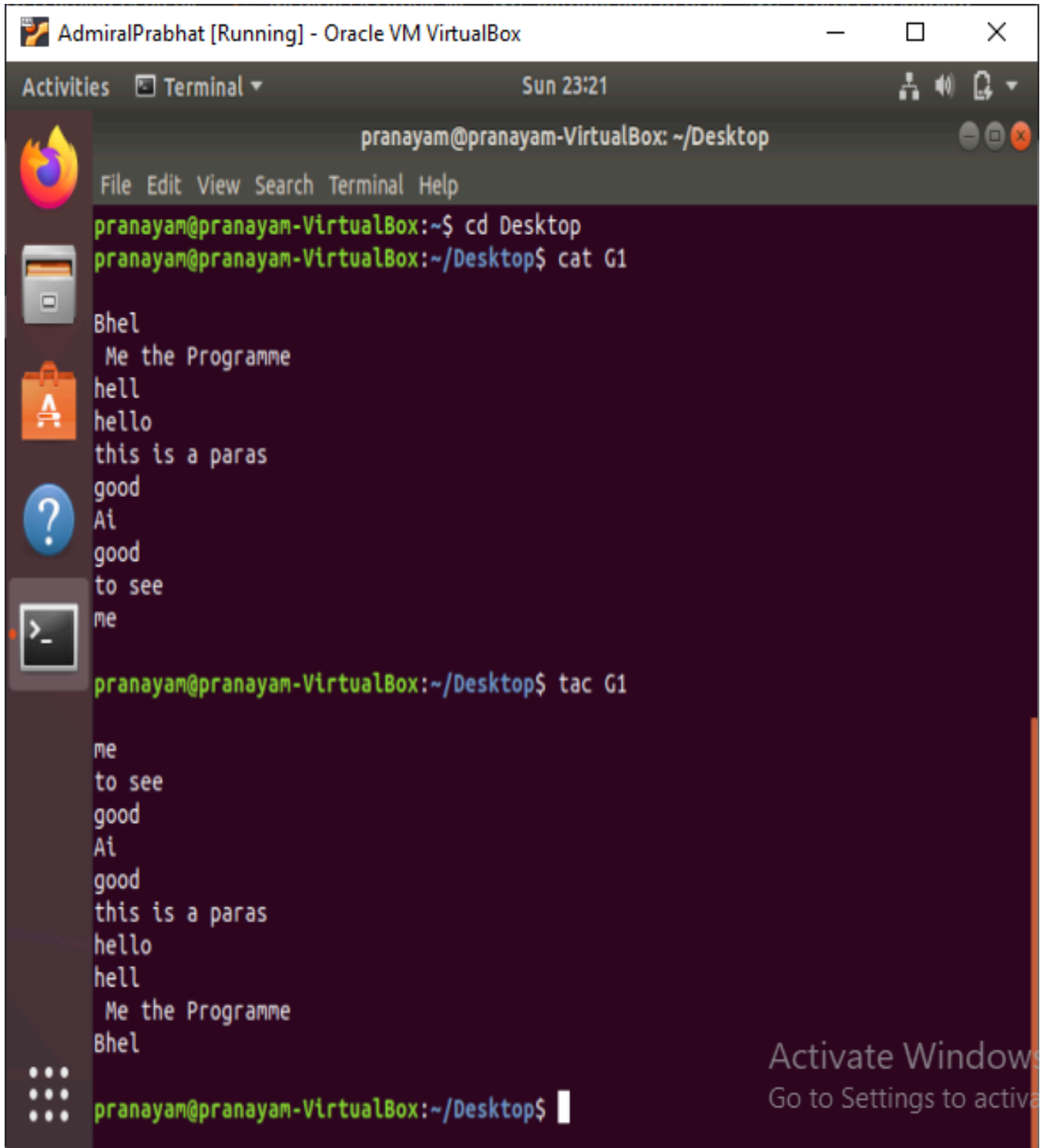
7: cat - concatenate files and print on the standard output.



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The user has navigated to the Desktop directory using the command `cd Desktop`. They then used the `cat G1` command to display the contents of a file named "G1". The output of this command is a multi-line text file containing the following lines: "Bhel", "Me the Programme", "hell", "hello", "this is a paras", "good", "Ai", "good", "to see", and "me". Subsequently, the user executed the `tac G1` command, which prints the contents of "G1" in reverse order. The output of `tac G1` is: "me", "to see", "good", "Ai", "good", "this is a paras", "hello", "hell", "Me the Programme", and "Bhel". The terminal window also shows a sidebar with various application icons and a system clock indicating "Sun 23:21". An "Activate Windows" watermark is visible in the bottom right corner of the terminal window.

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~$ cd Desktop
pranayam@pranayam-VirtualBox:~/Desktop$ cat G1
Bhel
Me the Programme
hell
hello
this is a paras
good
Ai
good
to see
me
pranayam@pranayam-VirtualBox:~/Desktop$ tac G1
me
to see
good
Ai
good
this is a paras
hello
hell
Me the Programme
Bhel
pranayam@pranayam-VirtualBox:~/Desktop$
```

8: tac - concatenate files and print in reverse order. (Note: similar to cat but prints in reverse)



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The terminal output shows the following commands and results:

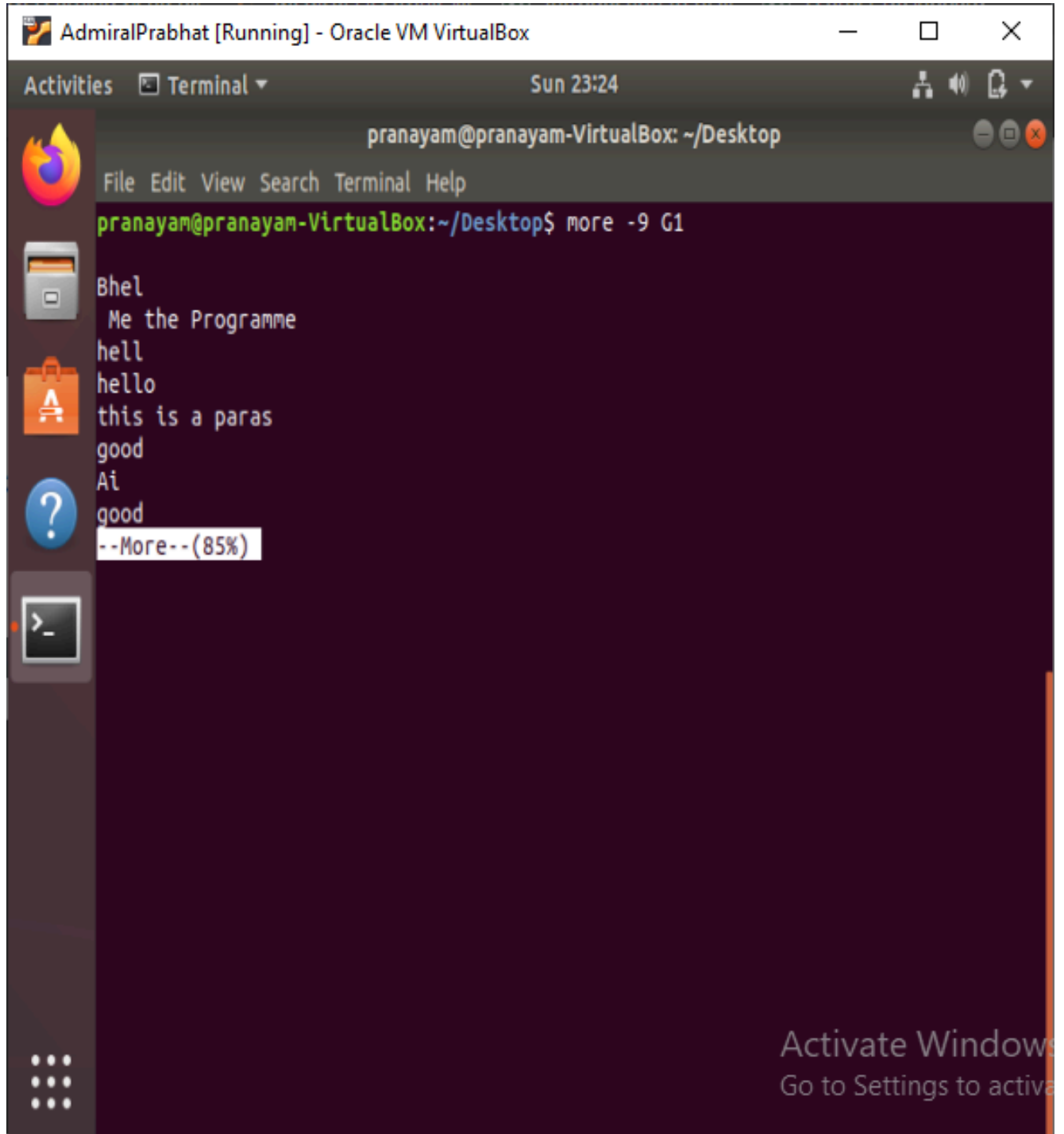
```
pranayam@pranayam-VirtualBox: ~/$ cd Desktop
pranayam@pranayam-VirtualBox: ~/Desktop$ cat G1
Bhel
  Me the Programme
hell
hello
this is a paras
good
Ai
good
to see
me

pranayam@pranayam-VirtualBox: ~/Desktop$ tac G1
me
to see
good
Ai
good
this is a paras
hello
hell
  Me the Programme
Bhel

pranayam@pranayam-VirtualBox: ~/Desktop$
```

The terminal window has a sidebar on the left with icons for Firefox, a file manager, a shopping bag, a question mark, and a terminal icon. The top of the window shows the date and time as "Sun 23:21".

9: more - displays only a few lines or a small section of the entire file at a time. Useful when screen size is very small.

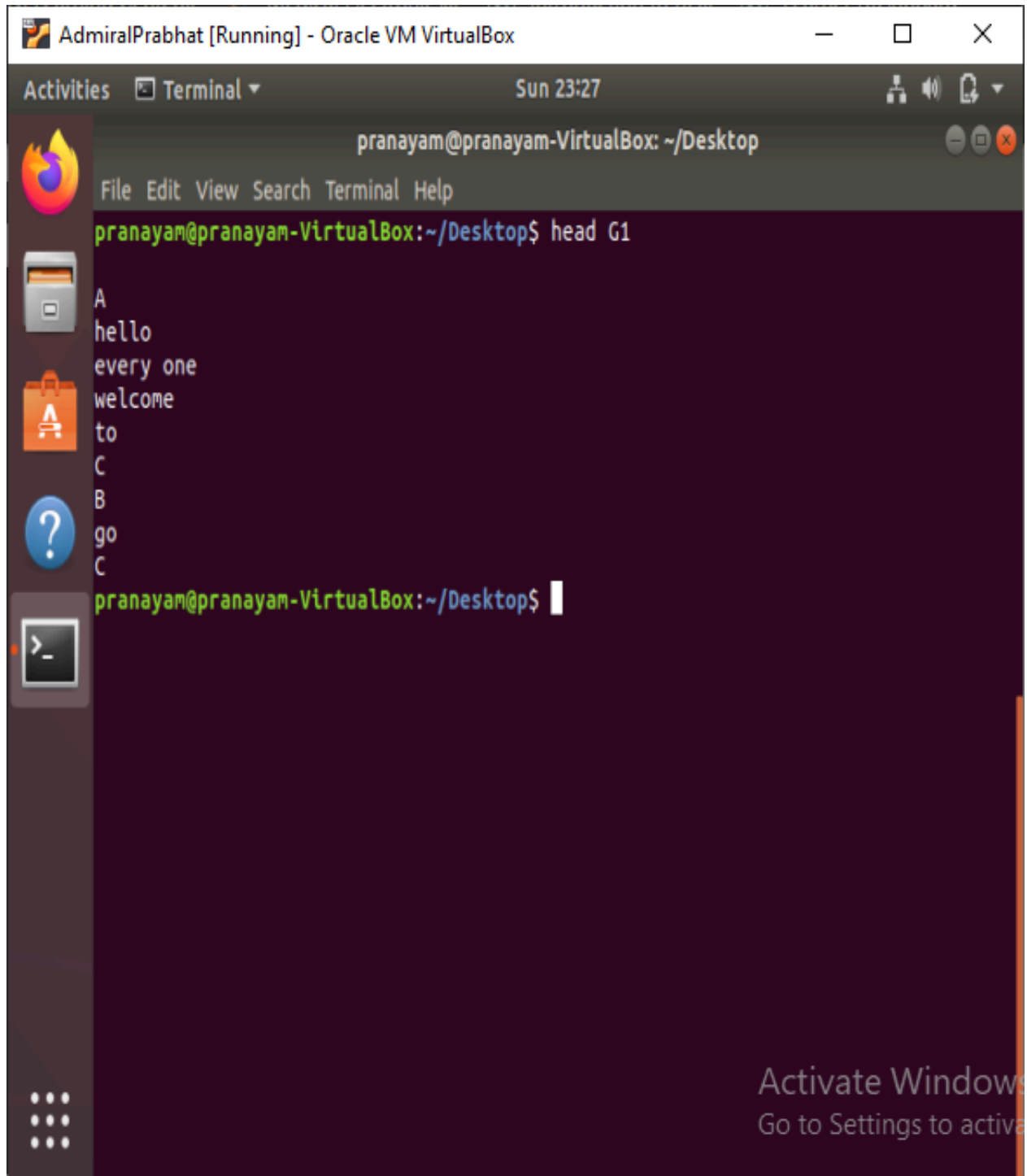


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The user has executed the command `more -9 G1`. The terminal displays the following output:

```
Bhel
Me the Programme
hell
hello
this is a paras
good
Ai
good
--More--(85%)
```

The terminal window includes a sidebar with icons for file manager, applications, and help. The bottom right corner of the window displays the text "Activate Windows Go to Settings to activate Windows".

10: head - print first 10 lines in a file.

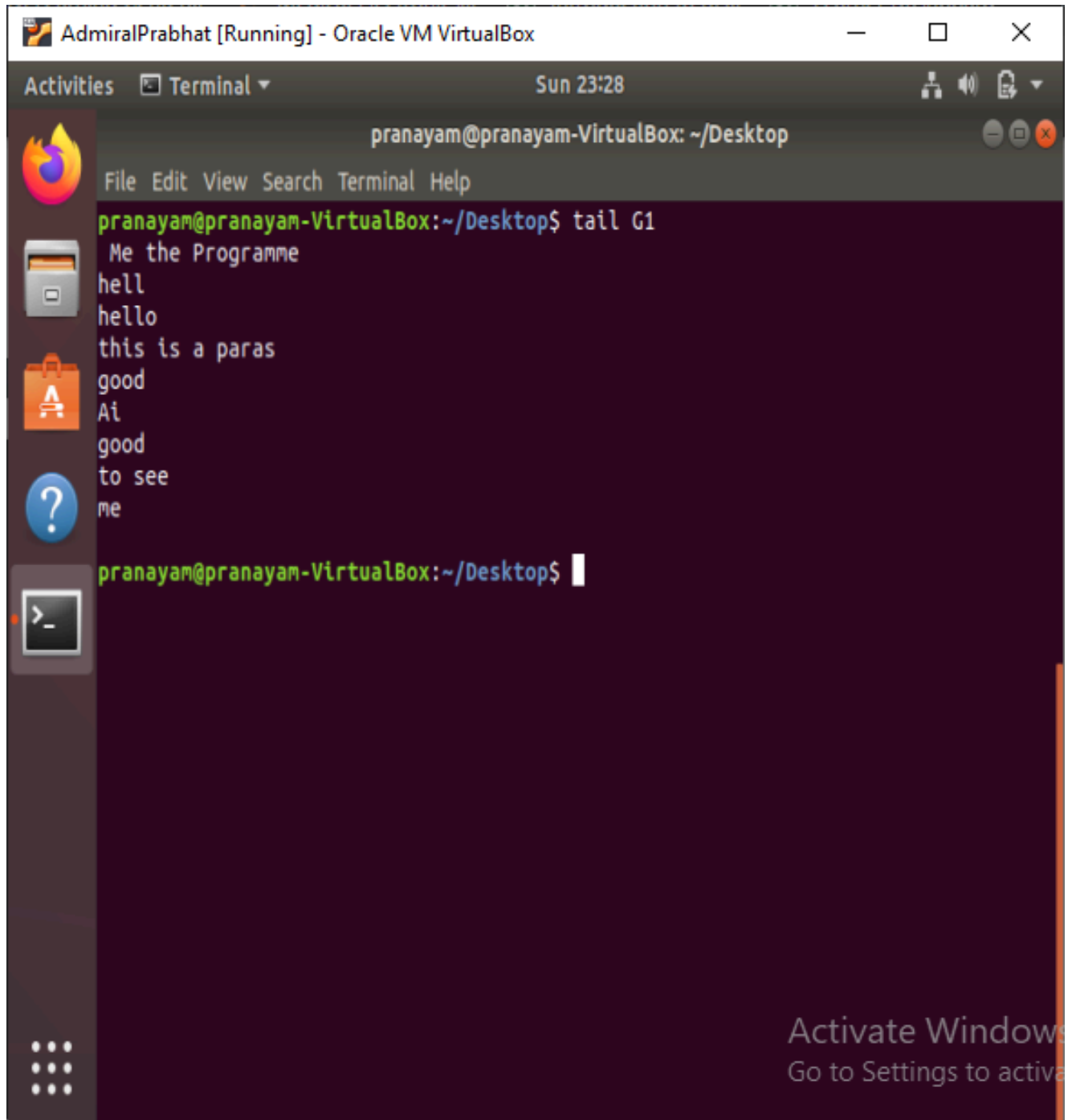


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" in the directory "~/Desktop". The command "head G1" has been executed, displaying the first 10 lines of the file "G1". The output is as follows:

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~/Desktop$ head G1
A
hello
every one
welcome
to
C
B
go
C
pranayam@pranayam-VirtualBox:~/Desktop$
```

The terminal window includes a sidebar with icons for Firefox, a file manager, an application store, a help icon, and a terminal icon. The bottom right corner of the window displays the text "Activate Windows Go to Settings to activate Windows".

11: tail - print the last 10 lines in a file.

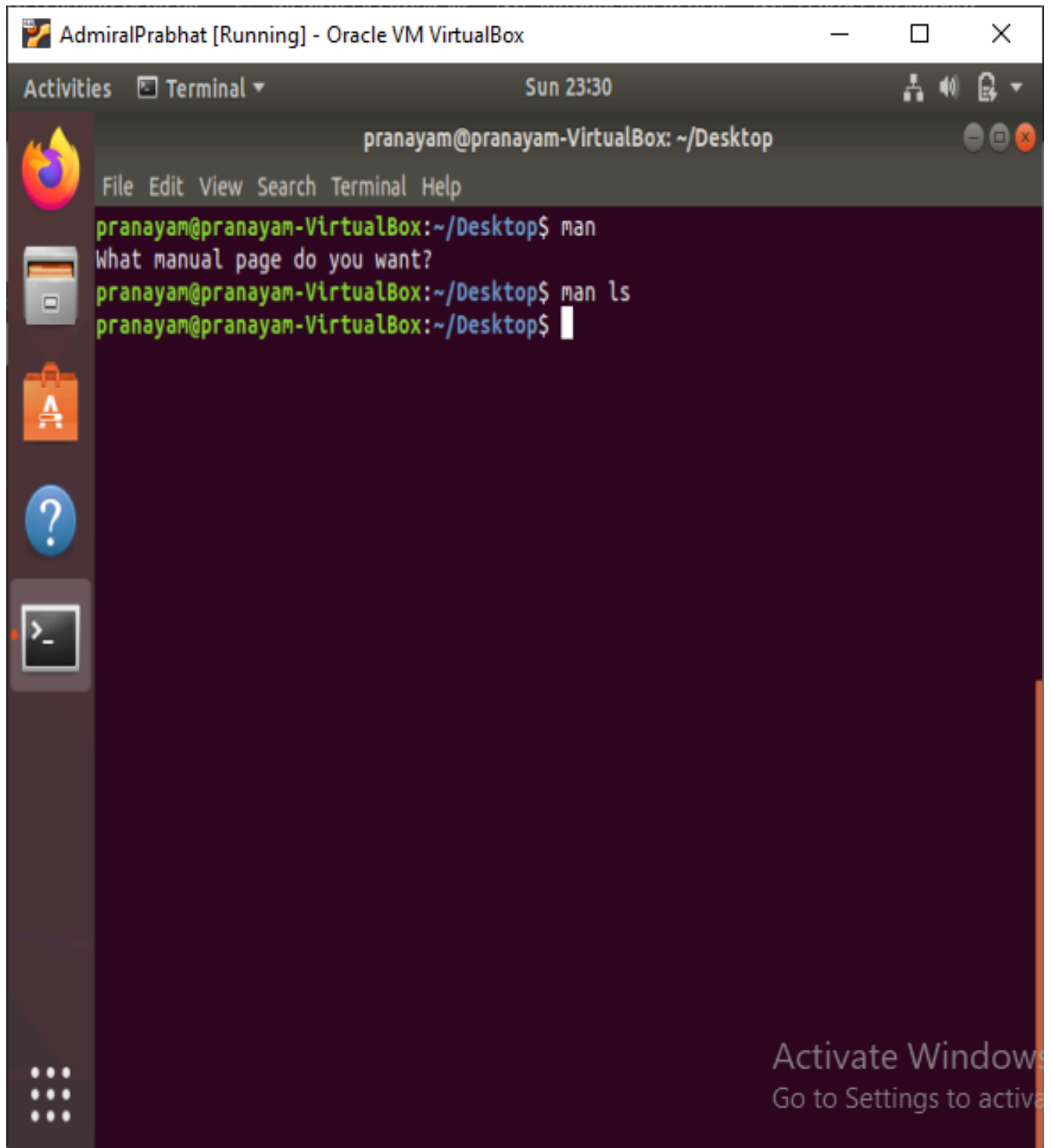


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal prompt is "pranayam@pranayam-VirtualBox: ~/Desktop". The command "tail G1" has been executed, and the output is displayed as follows:

```
pranayam@pranayam-VirtualBox:~/Desktop$ tail G1
Me the Programme
hell
hello
this is a paras
good
Ai
good
to see
me
pranayam@pranayam-VirtualBox:~/Desktop$
```

The terminal window also features a sidebar with icons for Firefox, a file manager, a shopping bag, a question mark, and a terminal icon. The bottom right corner of the window displays the text "Activate Windows" and "Go to Settings to activate".

12: man - displays manual pages of any command in terminal.



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal prompt is "pranayam@pranayam-VirtualBox: ~/Desktop". The user enters the command "man", which prompts "What manual page do you want?". The user then enters "ls", and the prompt returns to "pranayam@pranayam-VirtualBox: ~/Desktop\$". The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The background is dark purple. On the left side, there is a vertical dock with icons for Firefox, a file manager, a shopping bag, a question mark, and a terminal icon. At the bottom right, there is a watermark that says "Activate Windows Go to Settings to activate".

```
pranayam@pranayam-VirtualBox: ~/Desktop$ man
What manual page do you want?
pranayam@pranayam-VirtualBox: ~/Desktop$ man ls
pranayam@pranayam-VirtualBox: ~/Desktop$
```

AdmiralPrabhat [Running] - Oracle VM VirtualBox

Activities Terminal Sun 23:30

pranayam@pranayam-VirtualBox: ~/Desktop

File Edit View Search Terminal Help

LS(1) User Commands LS(1)

NAME

ls - list directory contents

SYNOPSIS

ls [OPTION]... [FILE]...

DESCRIPTION

List information about the FILES (the current directory by default). Sort entries alphabetically if none of **-cftuvSUX** nor **--sort** is specified.

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

-a, --all

do not ignore entries starting with .

-A, --almost-all

do not list implied . and ..

--author

with -l, print the author of each file

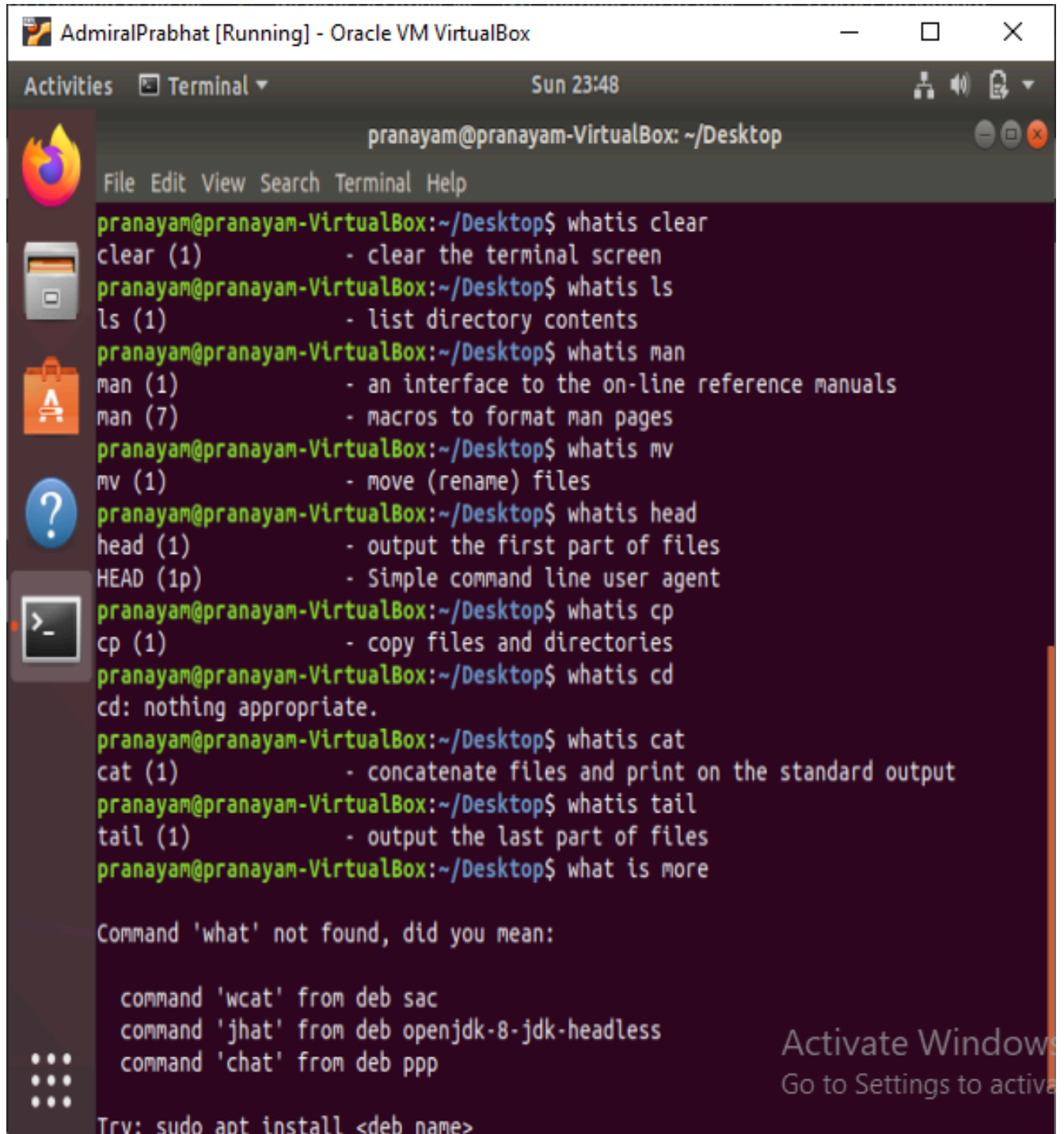
-b, --escape

print C-style escapes for nongraphic characters

Manual page ls(1) line 1 (press h for help or q to quit)

Activate Windows Go to Settings to activate Windows

1 3: whatis - display one line manual page descriptions. Useful as a quick reminder on what a particular command does



```
AdmiralPrabhat [Running] - Oracle VM VirtualBox
Sun 23:48
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~/Desktop$ whatis clear
clear (1)          - clear the terminal screen
pranayam@pranayam-VirtualBox:~/Desktop$ whatis ls
ls (1)             - list directory contents
pranayam@pranayam-VirtualBox:~/Desktop$ whatis man
man (1)            - an interface to the on-line reference manuals
man (7)            - macros to format man pages
pranayam@pranayam-VirtualBox:~/Desktop$ whatis mv
mv (1)             - move (rename) files
pranayam@pranayam-VirtualBox:~/Desktop$ whatis head
head (1)           - output the first part of files
HEAD (1p)          - Simple command line user agent
pranayam@pranayam-VirtualBox:~/Desktop$ whatis cp
cp (1)             - copy files and directories
pranayam@pranayam-VirtualBox:~/Desktop$ whatis cd
cd: nothing appropriate.
pranayam@pranayam-VirtualBox:~/Desktop$ whatis cat
cat (1)            - concatenate files and print on the standard output
pranayam@pranayam-VirtualBox:~/Desktop$ whatis tail
tail (1)           - output the last part of files
pranayam@pranayam-VirtualBox:~/Desktop$ what is more

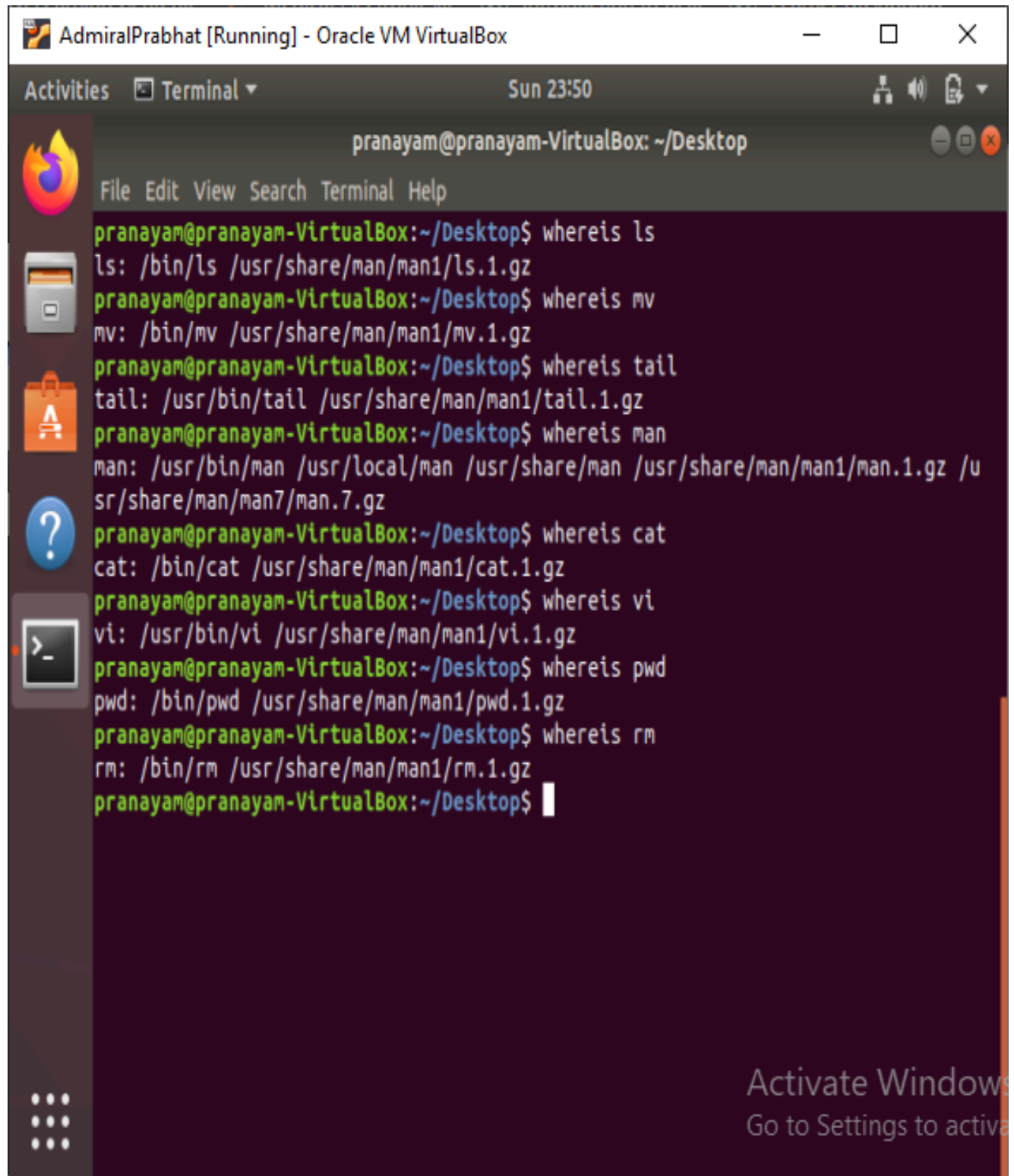
Command 'what' not found, did you mean:

  command 'wcat' from deb sac
  command 'jhat' from deb openjdk-8-jdk-headless
  command 'chat' from deb ppp

Trv: sudo apt install <deb name>
```

Activate Windows
Go to Settings to activate Windows

14: whereis - locate the binary, source and manual page files for each command.



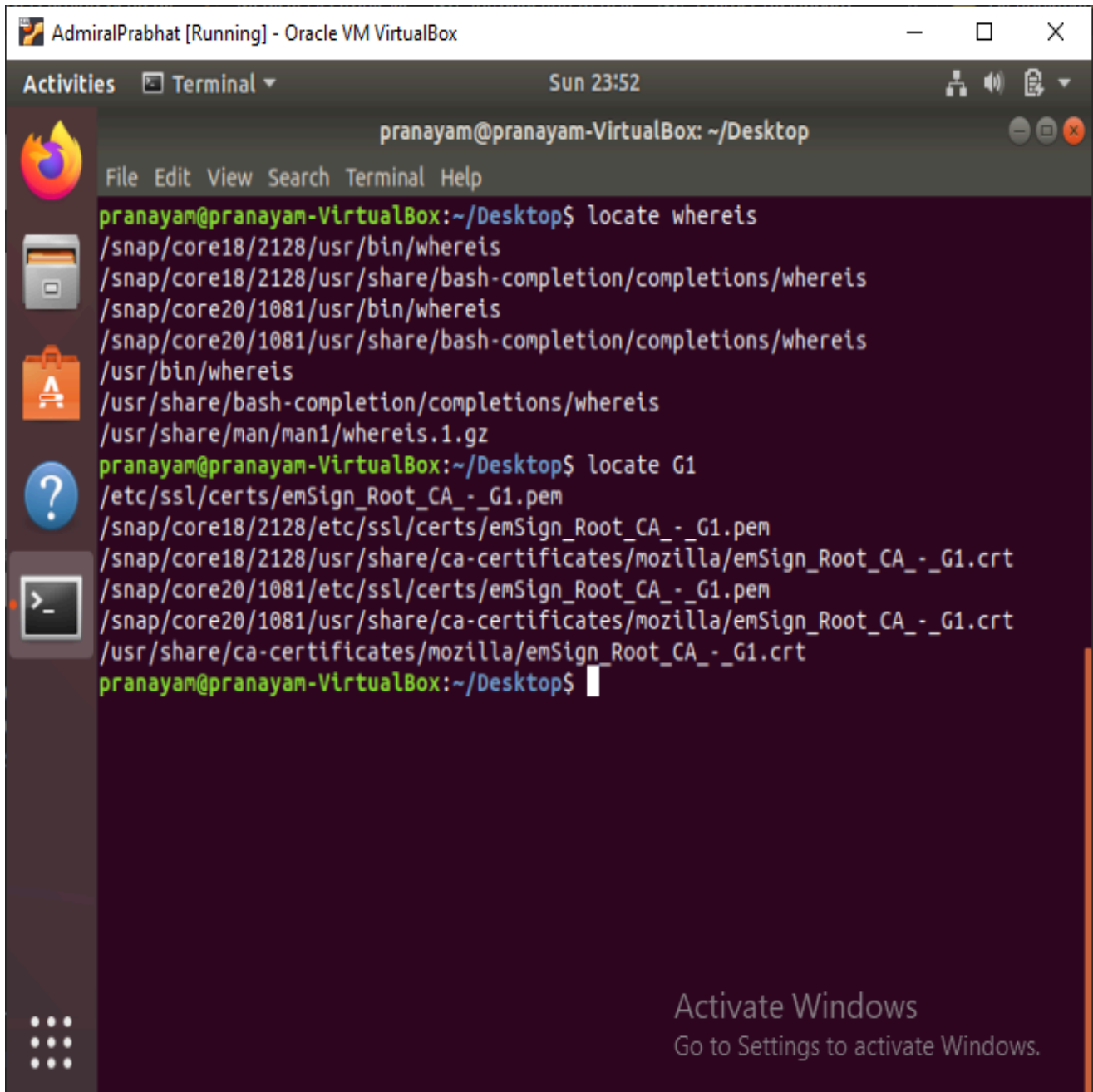
The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The terminal output shows the results of the 'whereis' command for several Linux utilities: 'ls', 'mv', 'tail', 'man', 'cat', 'vi', 'pwd', and 'rm'. Each command is followed by its binary location, source file location, and manual page locations. The terminal also shows the standard Ubuntu desktop environment with icons for Firefox, Files, and other applications on the left sidebar. The bottom right corner of the terminal window displays the message "Activate Windows Go to Settings to activate Windows".

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help

pranayam@pranayam-VirtualBox:~/Desktop$ whereis ls
ls: /bin/ls /usr/share/man/man1/ls.1.gz
pranayam@pranayam-VirtualBox:~/Desktop$ whereis mv
mv: /bin/mv /usr/share/man/man1/mv.1.gz
pranayam@pranayam-VirtualBox:~/Desktop$ whereis tail
tail: /usr/bin/tail /usr/share/man/man1/tail.1.gz
pranayam@pranayam-VirtualBox:~/Desktop$ whereis man
man: /usr/bin/man /usr/local/man /usr/share/man /usr/share/man/man1/man.1.gz /u
sr/share/man/man7/man.7.gz
pranayam@pranayam-VirtualBox:~/Desktop$ whereis cat
cat: /bin/cat /usr/share/man/man1/cat.1.gz
pranayam@pranayam-VirtualBox:~/Desktop$ whereis vi
vi: /usr/bin/vi /usr/share/man/man1/vi.1.gz
pranayam@pranayam-VirtualBox:~/Desktop$ whereis pwd
pwd: /bin/pwd /usr/share/man/man1/pwd.1.gz
pranayam@pranayam-VirtualBox:~/Desktop$ whereis rm
rm: /bin/rm /usr/share/man/man1/rm.1.gz
pranayam@pranayam-VirtualBox:~/Desktop$
```

Activate Windows
Go to Settings to activate Windows

15: locate - helps to search for a particular file by using file name.

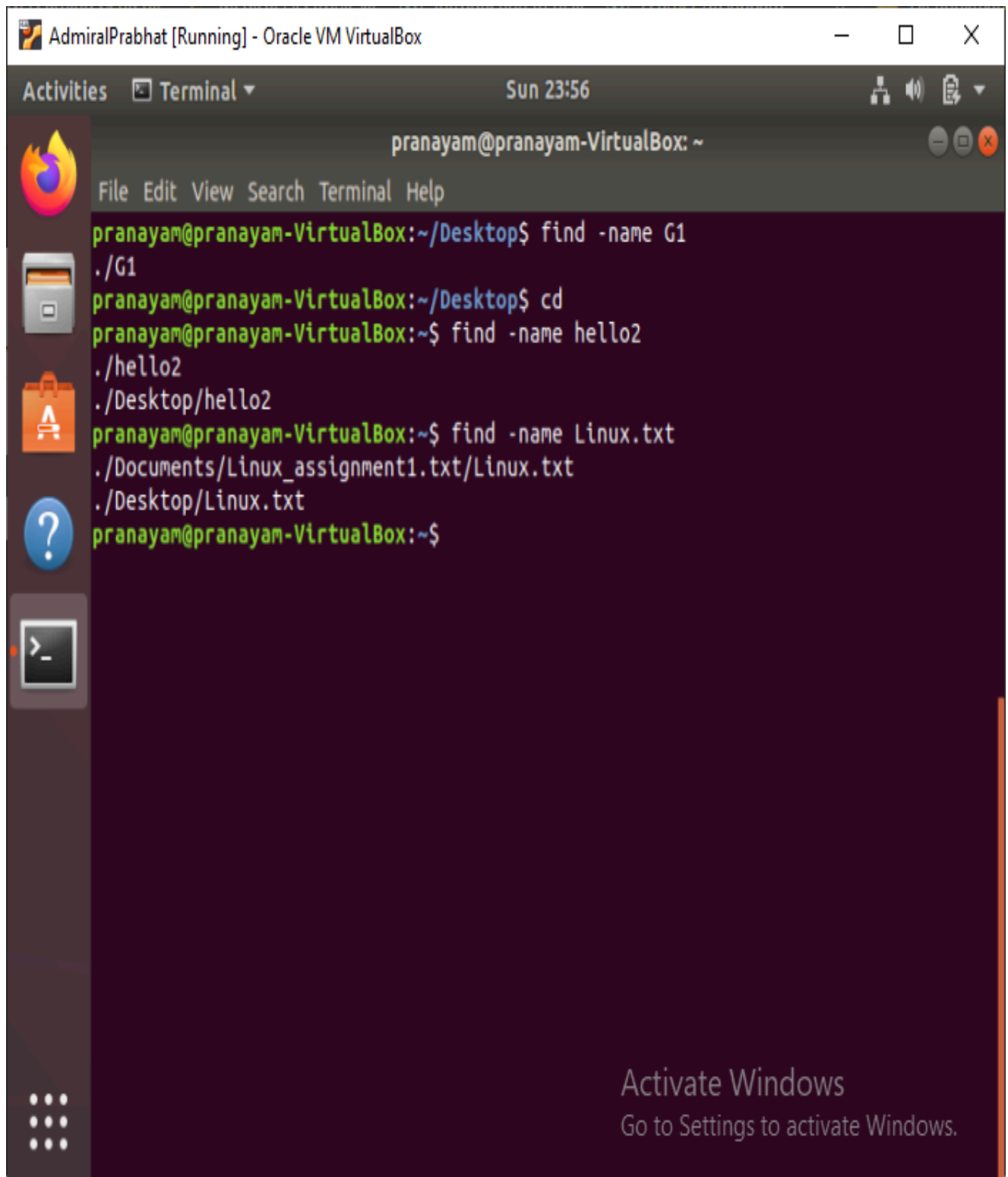


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The window has a menu bar with "Activities", "Terminal", and a dropdown arrow. The status bar shows "Sun 23:52" and system icons. The terminal prompt is "pranayam@pranayam-VirtualBox: ~/Desktop". The terminal content shows the following commands and output:

```
pranayam@pranayam-VirtualBox:~/Desktop$ locate whereis
/snap/core18/2128/usr/bin/whereis
/snap/core18/2128/usr/share/bash-completion/completions/whereis
/snap/core20/1081/usr/bin/whereis
/snap/core20/1081/usr/share/bash-completion/completions/whereis
/usr/bin/whereis
/usr/share/bash-completion/completions/whereis
/usr/share/man/man1/whereis.1.gz
pranayam@pranayam-VirtualBox:~/Desktop$ locate G1
/etc/ssl/certs/emSign_Root_CA_-_G1.pem
/snap/core18/2128/etc/ssl/certs/emSign_Root_CA_-_G1.pem
/snap/core18/2128/usr/share/ca-certificates/mozilla/emSign_Root_CA_-_G1.crt
/snap/core20/1081/etc/ssl/certs/emSign_Root_CA_-_G1.pem
/snap/core20/1081/usr/share/ca-certificates/mozilla/emSign_Root_CA_-_G1.crt
/usr/share/ca-certificates/mozilla/emSign_Root_CA_-_G1.crt
pranayam@pranayam-VirtualBox:~/Desktop$
```

At the bottom right of the terminal window, there is a watermark that says "Activate Windows" and "Go to Settings to activate Windows."

16: find - search for files in a directory hierarchy.

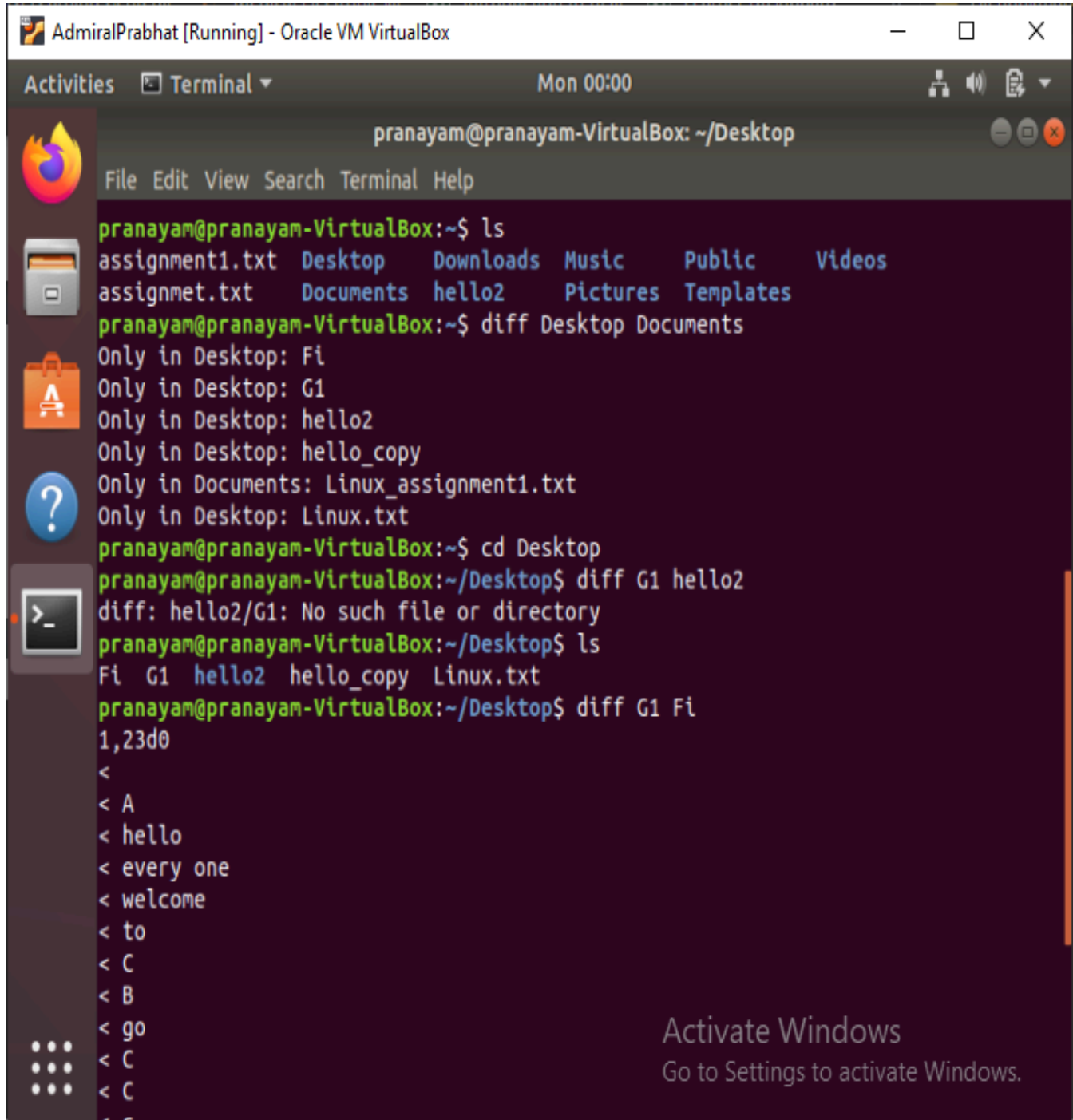


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal prompt is "pranayam@pranayam-VirtualBox: ~". The user has executed the following commands and received the following output:

```
pranayam@pranayam-VirtualBox:~/Desktop$ find -name G1
./G1
pranayam@pranayam-VirtualBox:~/Desktop$ cd
pranayam@pranayam-VirtualBox:~$ find -name hello2
./hello2
./Desktop/hello2
pranayam@pranayam-VirtualBox:~$ find -name Linux.txt
./Documents/Linux_assignment1.txt/Linux.txt
./Desktop/Linux.txt
pranayam@pranayam-VirtualBox:~$
```

The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom right says "Activate Windows" and "Go to Settings to activate Windows.".

17: diff - compares files line by line and displays the difference between each file.



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The terminal output shows the following commands and results:

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help

pranayam@pranayam-VirtualBox:~$ ls
assignment1.txt Desktop Downloads Music Public Videos
assignmet.txt Documents hello2 Pictures Templates

pranayam@pranayam-VirtualBox:~$ diff Desktop Documents
Only in Desktop: Fi
Only in Desktop: G1
Only in Desktop: hello2
Only in Desktop: hello_copy
Only in Documents: Linux_assignment1.txt
Only in Desktop: Linux.txt

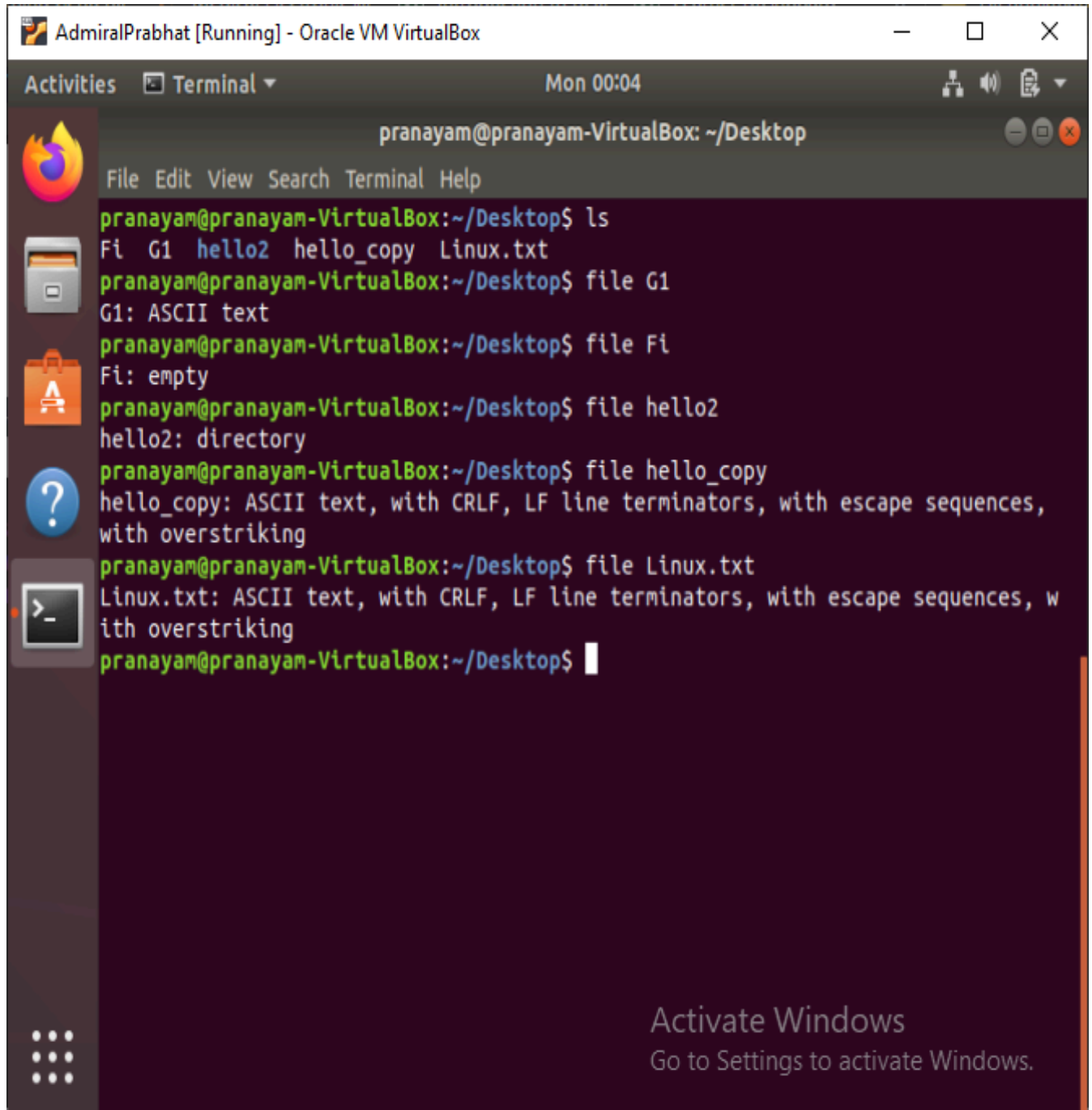
pranayam@pranayam-VirtualBox:~$ cd Desktop
pranayam@pranayam-VirtualBox:~/Desktop$ diff G1 hello2
diff: hello2/G1: No such file or directory

pranayam@pranayam-VirtualBox:~/Desktop$ ls
Fi G1 hello2 hello_copy Linux.txt

pranayam@pranayam-VirtualBox:~/Desktop$ diff G1 Fi
1,23d0
<
< A
< hello
< every one
< welcome
< to
< C
< B
< go
< C
< C
< C
```

An "Activate Windows" watermark is visible in the bottom right corner of the terminal window.

18: file - helps to determine file type.

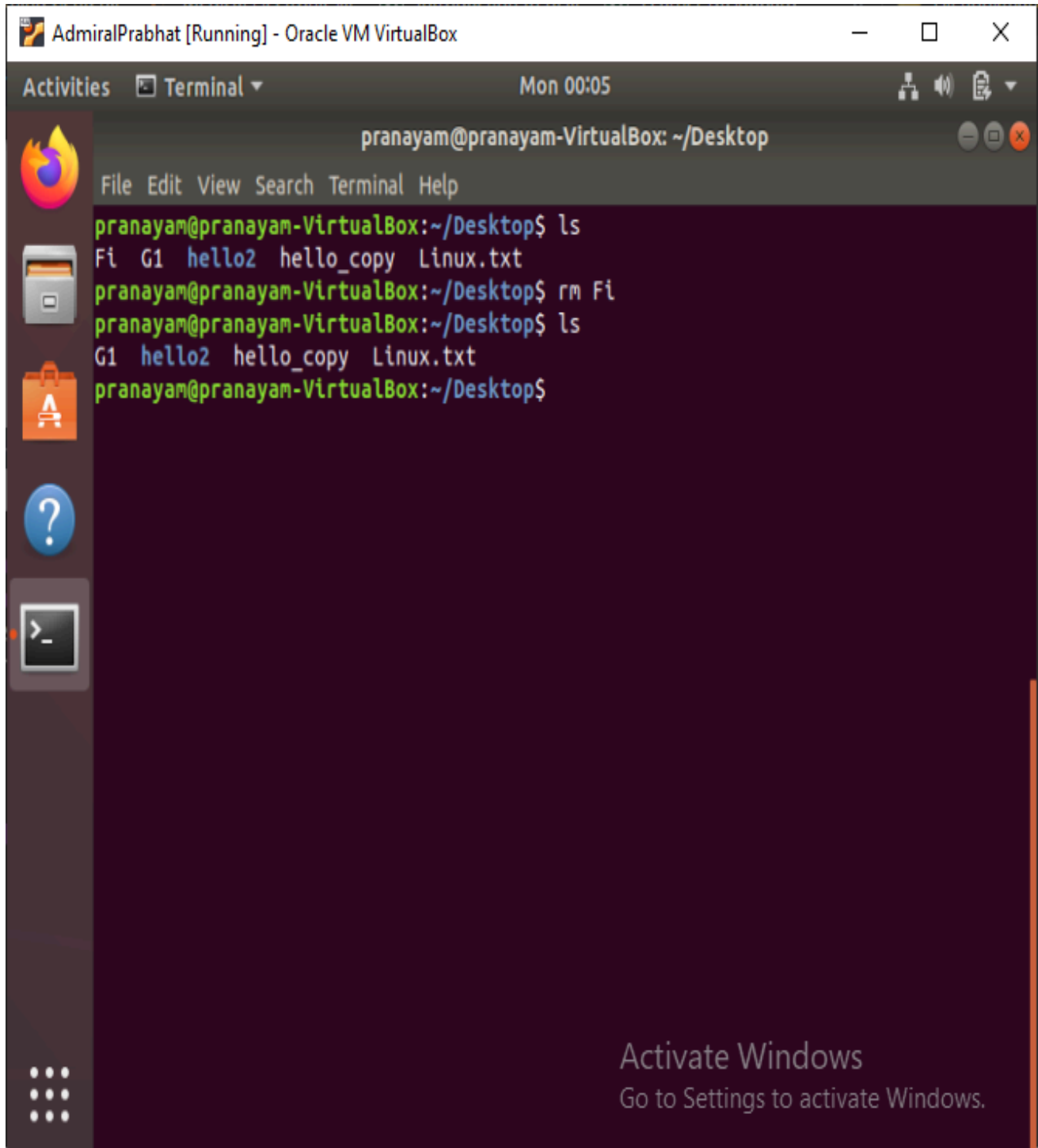


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" in the directory "~/Desktop". The terminal output shows the following commands and results:

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~/Desktop$ ls
Fi G1 hello2 hello_copy Linux.txt
pranayam@pranayam-VirtualBox:~/Desktop$ file G1
G1: ASCII text
pranayam@pranayam-VirtualBox:~/Desktop$ file Fi
Fi: empty
pranayam@pranayam-VirtualBox:~/Desktop$ file hello2
hello2: directory
pranayam@pranayam-VirtualBox:~/Desktop$ file hello_copy
hello_copy: ASCII text, with CRLF, LF line terminators, with escape sequences,
with overstriking
pranayam@pranayam-VirtualBox:~/Desktop$ file Linux.txt
Linux.txt: ASCII text, with CRLF, LF line terminators, with escape sequences, w
ith overstriking
pranayam@pranayam-VirtualBox:~/Desktop$
```

At the bottom of the terminal window, there is a message: "Activate Windows Go to Settings to activate Windows."

19: rm - remove files or directories

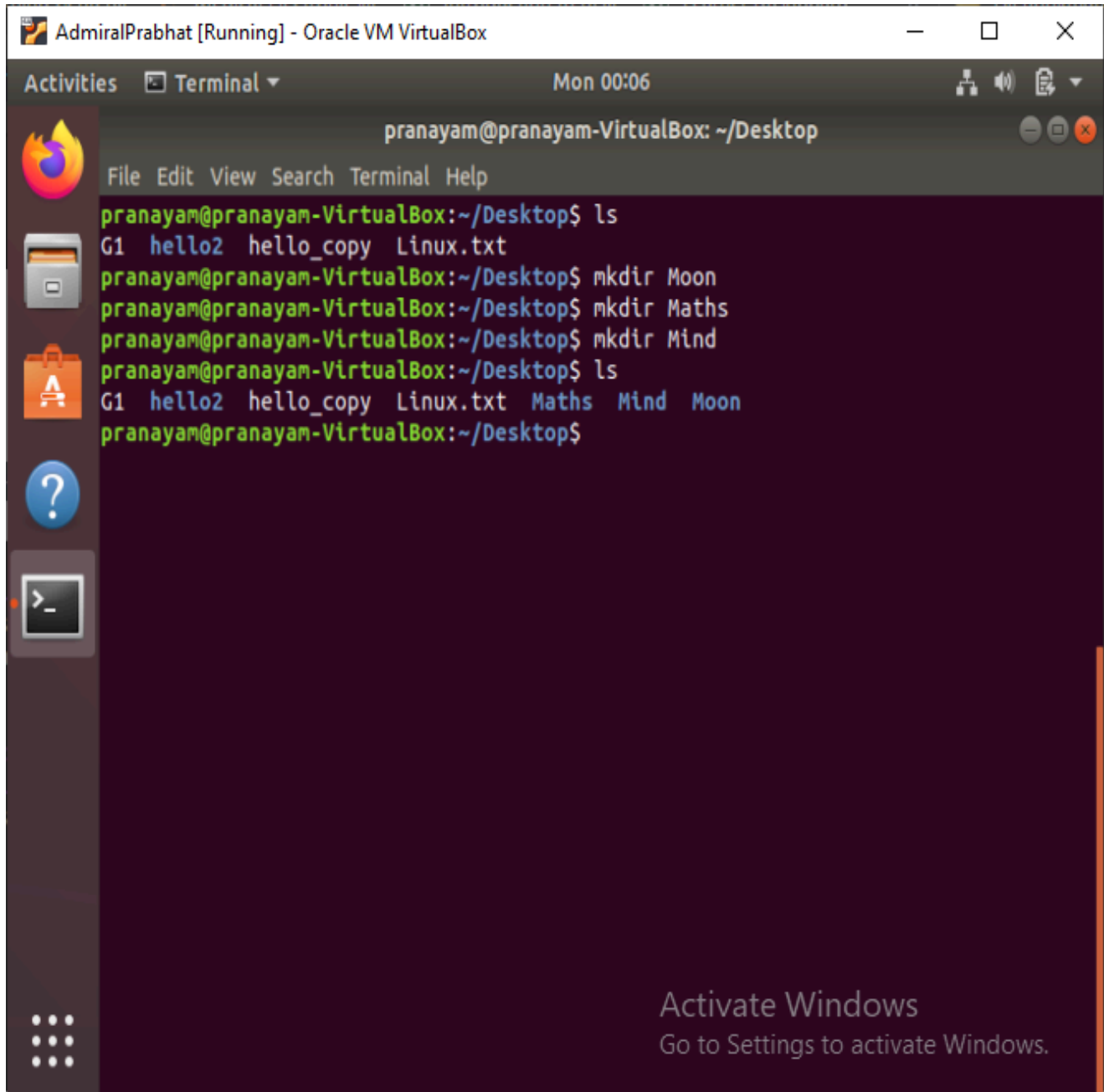


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" in the directory "~/Desktop". The terminal output shows the following commands and results:

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~/Desktop$ ls
Fi G1 hello2 hello_copy Linux.txt
pranayam@pranayam-VirtualBox:~/Desktop$ rm Fi
pranayam@pranayam-VirtualBox:~/Desktop$ ls
G1 hello2 hello_copy Linux.txt
pranayam@pranayam-VirtualBox:~/Desktop$
```

The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The left sidebar shows icons for Firefox, a file manager, a shopping bag, a question mark, and a terminal icon. The bottom right corner of the terminal window displays the message: "Activate Windows Go to Settings to activate Windows."

20: mkdir - create directories

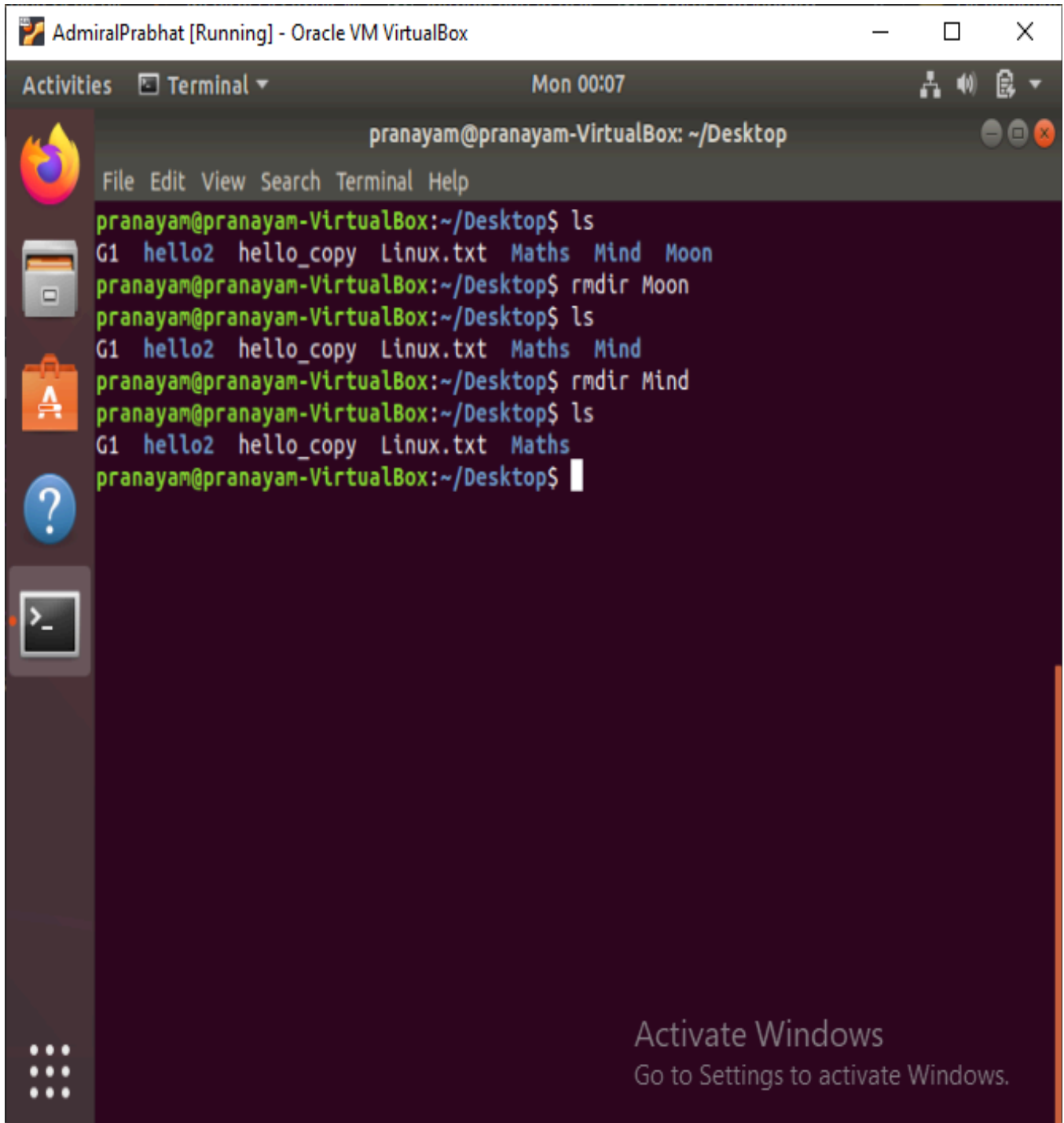


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" in the directory "~/Desktop". The terminal output shows the following commands and results:

```
pranayam@pranayam-VirtualBox:~/Desktop$ ls
G1 hello2 hello_copy Linux.txt
pranayam@pranayam-VirtualBox:~/Desktop$ mkdir Moon
pranayam@pranayam-VirtualBox:~/Desktop$ mkdir Maths
pranayam@pranayam-VirtualBox:~/Desktop$ mkdir Mind
pranayam@pranayam-VirtualBox:~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths Mind Moon
pranayam@pranayam-VirtualBox:~/Desktop$
```

The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom right says "Activate Windows" and "Go to Settings to activate Windows.".

21: rmdir - remove directories

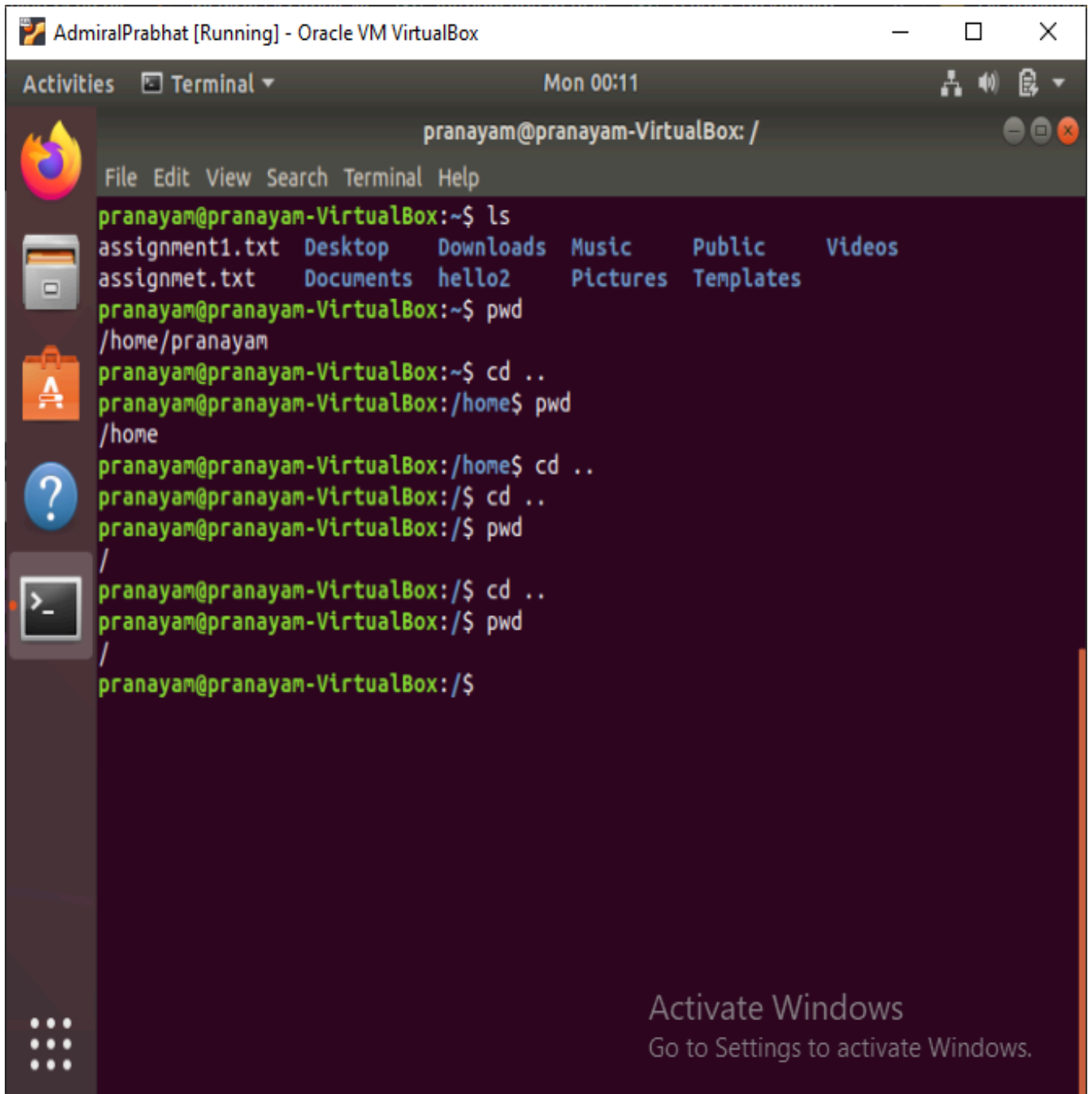


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" in the directory "~/Desktop". The terminal output shows the following sequence of commands and results:

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths Mind Moon
pranayam@pranayam-VirtualBox:~/Desktop$ rmdir Moon
pranayam@pranayam-VirtualBox:~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths Mind
pranayam@pranayam-VirtualBox:~/Desktop$ rmdir Mind
pranayam@pranayam-VirtualBox:~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths
pranayam@pranayam-VirtualBox:~/Desktop$
```

The terminal window also displays a message at the bottom right: "Activate Windows Go to Settings to activate Windows."

22: cd - change current working directory

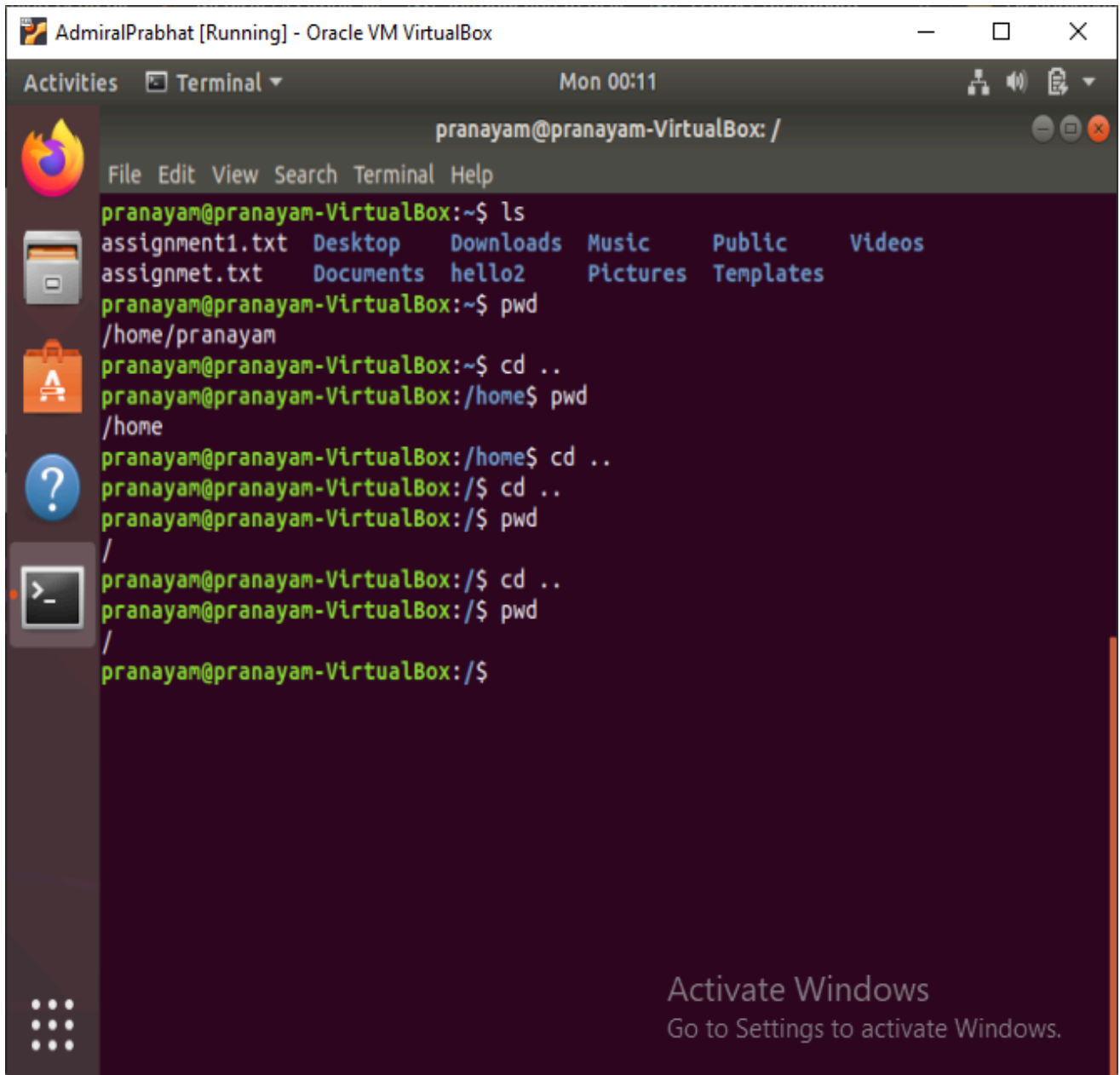


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal output is as follows:

```
pranayam@pranayam-VirtualBox: /  
File Edit View Search Terminal Help  
pranayam@pranayam-VirtualBox:~$ ls  
assignment1.txt Desktop Downloads Music Public Videos  
assignmet.txt Documents hello2 Pictures Templates  
pranayam@pranayam-VirtualBox:~$ pwd  
/home/pranayam  
pranayam@pranayam-VirtualBox:~$ cd ..  
pranayam@pranayam-VirtualBox:/home$ pwd  
/home  
pranayam@pranayam-VirtualBox:/home$ cd ..  
pranayam@pranayam-VirtualBox:/$ cd ..  
pranayam@pranayam-VirtualBox:/$ pwd  
/  
pranayam@pranayam-VirtualBox:/$ cd ..  
pranayam@pranayam-VirtualBox:/$ pwd  
/  
pranayam@pranayam-VirtualBox:/$
```

An "Activate Windows" watermark is visible in the bottom right corner of the terminal window, with the text "Go to Settings to activate Windows."

23: pwd - print the name of present working directory

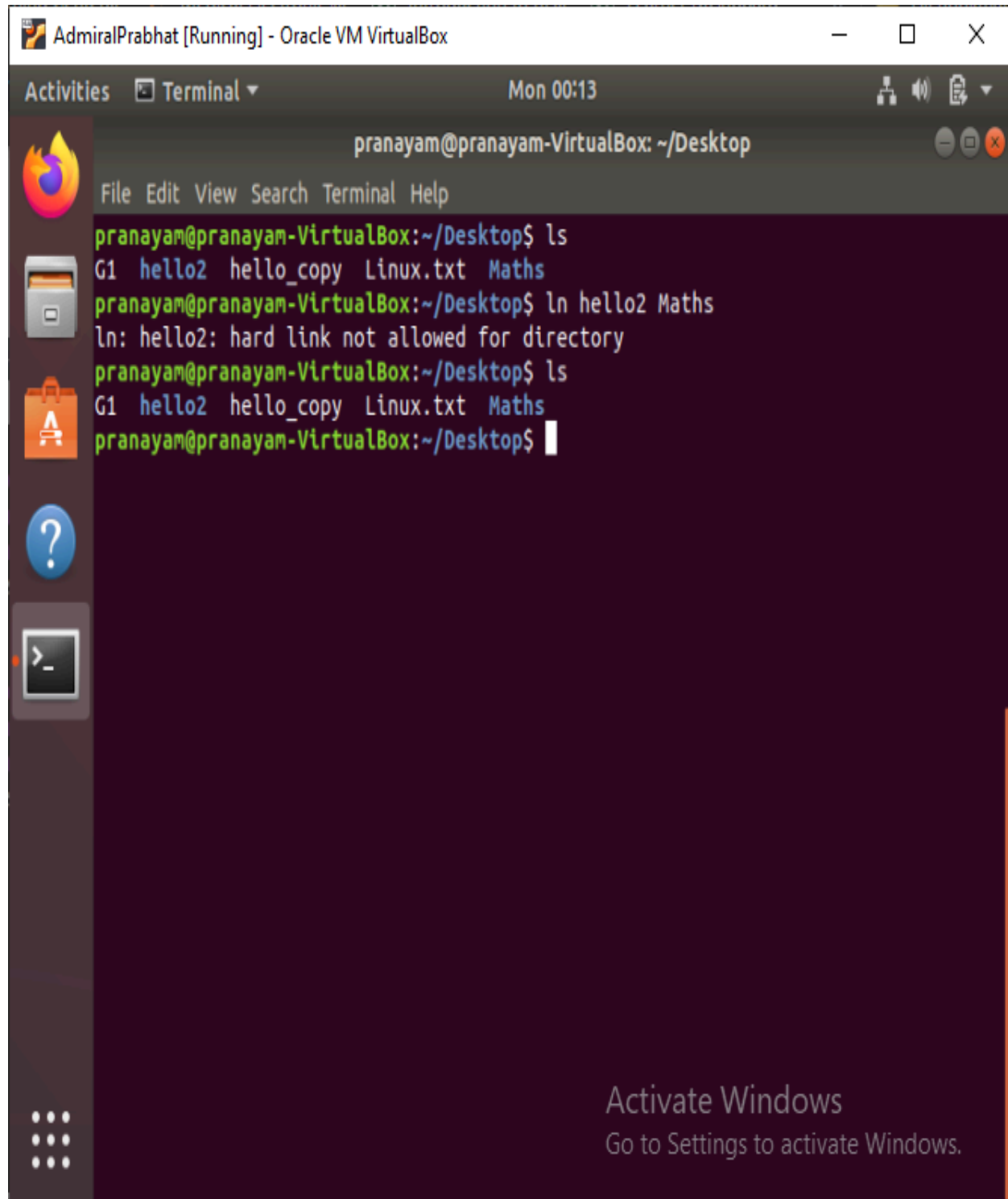


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running a Linux environment. The user, "pranayam", is at the prompt "pranayam@pranayam-VirtualBox: /". The terminal output shows the following sequence of commands and their results:

```
pranayam@pranayam-VirtualBox:~$ ls
assignment1.txt Desktop Downloads Music Public Videos
assignmet.txt Documents hello2 Pictures Templates
pranayam@pranayam-VirtualBox:~$ pwd
/home/pranayam
pranayam@pranayam-VirtualBox:~$ cd ..
pranayam@pranayam-VirtualBox:/home$ pwd
/home
pranayam@pranayam-VirtualBox:/home$ cd ..
pranayam@pranayam-VirtualBox:/$ cd ..
pranayam@pranayam-VirtualBox:/$ pwd
/
pranayam@pranayam-VirtualBox:/$ cd ..
pranayam@pranayam-VirtualBox:/$ pwd
/
pranayam@pranayam-VirtualBox:/$
```

The terminal window also displays a sidebar with icons for various applications (Firefox, Files, LibreOffice, etc.) and a system menu at the top. The bottom right corner of the terminal window shows a message: "Activate Windows Go to Settings to activate Windows."

24: ln & ln -s - make hard links and symbolic links between files respectively.

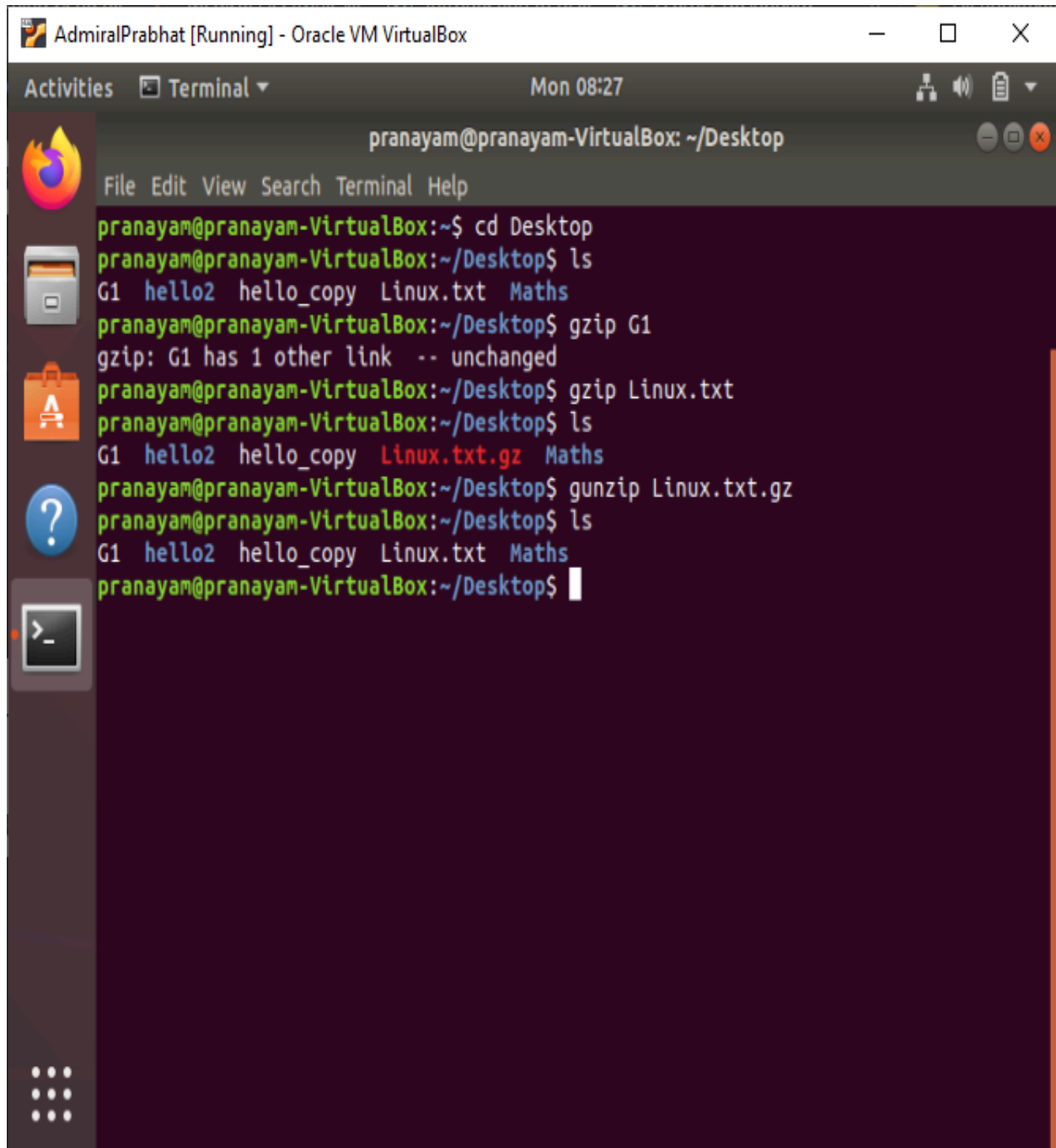


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" in the directory "~/Desktop". The user has executed the following commands:

```
pranayam@pranayam-VirtualBox: ~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths
pranayam@pranayam-VirtualBox: ~/Desktop$ ln hello2 Maths
ln: hello2: hard link not allowed for directory
pranayam@pranayam-VirtualBox: ~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths
pranayam@pranayam-VirtualBox: ~/Desktop$
```

The terminal output shows that the command `ln hello2 Maths` failed with the error message "ln: hello2: hard link not allowed for directory". The `ls` command was run before and after the failed command, showing the same directory contents: `G1 hello2 hello_copy Linux.txt Maths`. The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom right says "Activate Windows Go to Settings to activate Windows."

25: gzip & gunzip - gzip reduces the size of named files using Lempel-Ziv encoding and gunzip decompresses files created by gzip

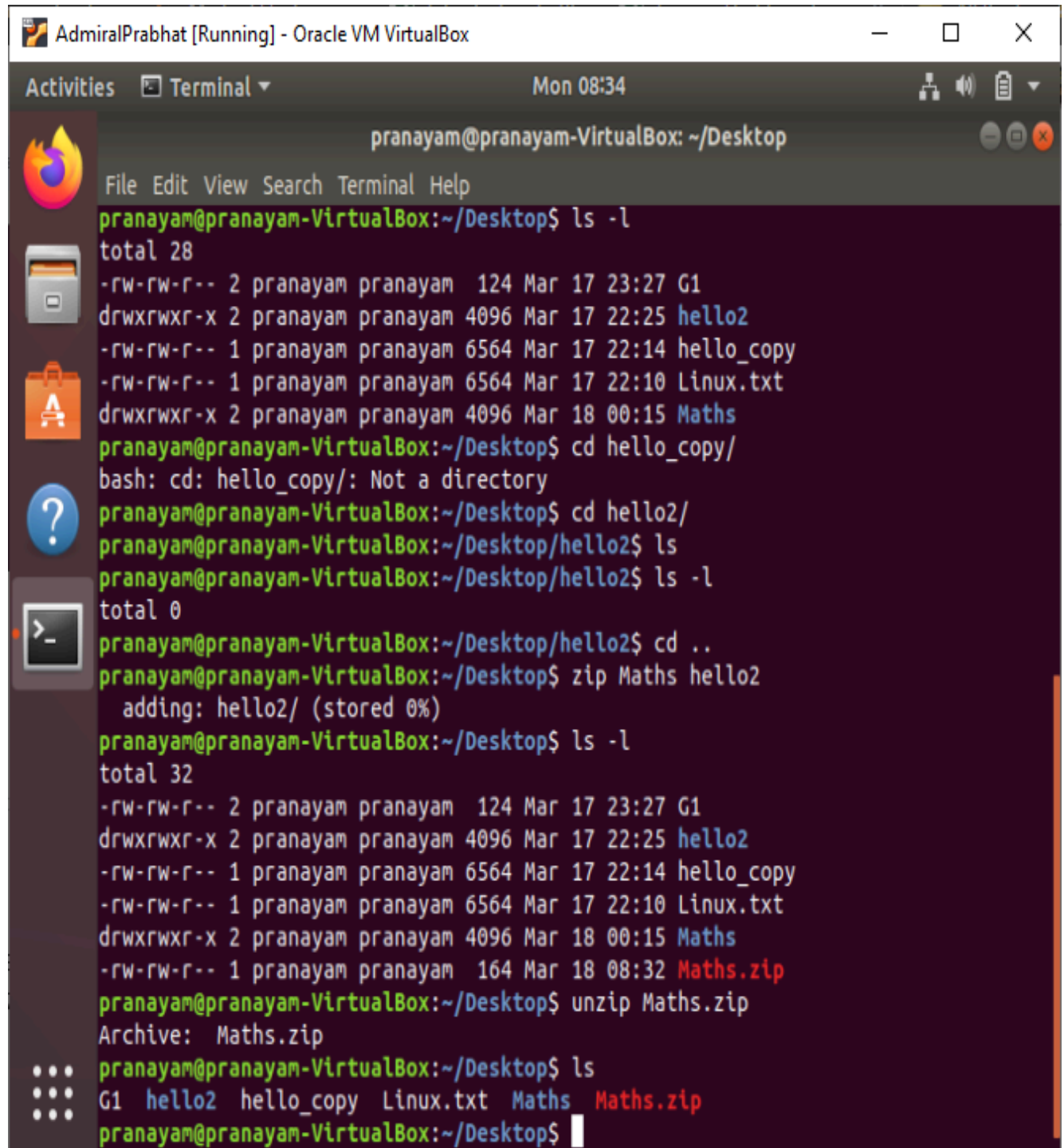


The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The terminal output shows the following sequence of commands and results:

```
pranayam@pranayam-VirtualBox: ~/$ cd Desktop
pranayam@pranayam-VirtualBox: ~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths
pranayam@pranayam-VirtualBox: ~/Desktop$ gzip G1
gzip: G1 has 1 other link -- unchanged
pranayam@pranayam-VirtualBox: ~/Desktop$ gzip Linux.txt
pranayam@pranayam-VirtualBox: ~/Desktop$ ls
G1 hello2 hello_copy Linux.txt.gz Maths
pranayam@pranayam-VirtualBox: ~/Desktop$ gunzip Linux.txt.gz
pranayam@pranayam-VirtualBox: ~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths
pranayam@pranayam-VirtualBox: ~/Desktop$
```

The terminal window includes a sidebar with icons for file manager, application store, help, and a terminal icon. The top bar shows the date and time as "Mon 08:27".

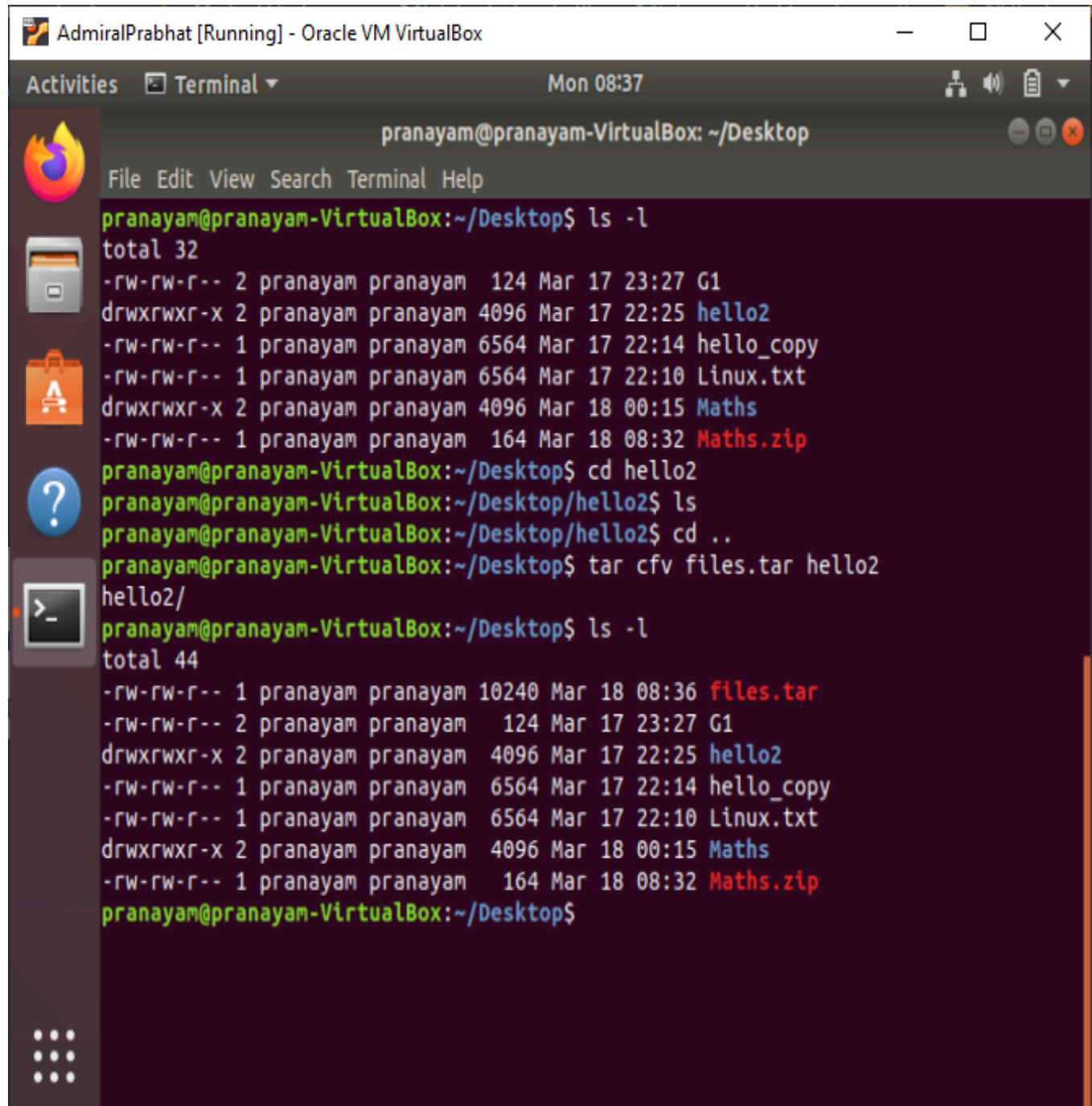
26: zip & unzip - zip helps to package and compress (archive) files, unzip helps to extract compressed files in a zip archive.



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The terminal output shows the following commands and their results:

```
pranayam@pranayam-VirtualBox: ~/Desktop
ls -l
total 28
-rw-rw-r-- 2 pranayam pranayam 124 Mar 17 23:27 G1
drwxrwxr-x 2 pranayam pranayam 4096 Mar 17 22:25 hello2
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:14 hello_copy
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:10 Linux.txt
drwxrwxr-x 2 pranayam pranayam 4096 Mar 18 00:15 Maths
pranayam@pranayam-VirtualBox: ~/Desktop$ cd hello_copy/
bash: cd: hello_copy/: Not a directory
pranayam@pranayam-VirtualBox: ~/Desktop$ cd hello2/
pranayam@pranayam-VirtualBox: ~/Desktop/hello2$ ls
pranayam@pranayam-VirtualBox: ~/Desktop/hello2$ ls -l
total 0
pranayam@pranayam-VirtualBox: ~/Desktop/hello2$ cd ..
pranayam@pranayam-VirtualBox: ~/Desktop$ zip Maths hello2
  adding: hello2/ (stored 0%)
pranayam@pranayam-VirtualBox: ~/Desktop$ ls -l
total 32
-rw-rw-r-- 2 pranayam pranayam 124 Mar 17 23:27 G1
drwxrwxr-x 2 pranayam pranayam 4096 Mar 17 22:25 hello2
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:14 hello_copy
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:10 Linux.txt
drwxrwxr-x 2 pranayam pranayam 4096 Mar 18 00:15 Maths
-rw-rw-r-- 1 pranayam pranayam 164 Mar 18 08:32 Maths.zip
pranayam@pranayam-VirtualBox: ~/Desktop$ unzip Maths.zip
Archive:  Maths.zip
pranayam@pranayam-VirtualBox: ~/Desktop$ ls
G1 hello2 hello_copy Linux.txt Maths Maths.zip
pranayam@pranayam-VirtualBox: ~/Desktop$
```

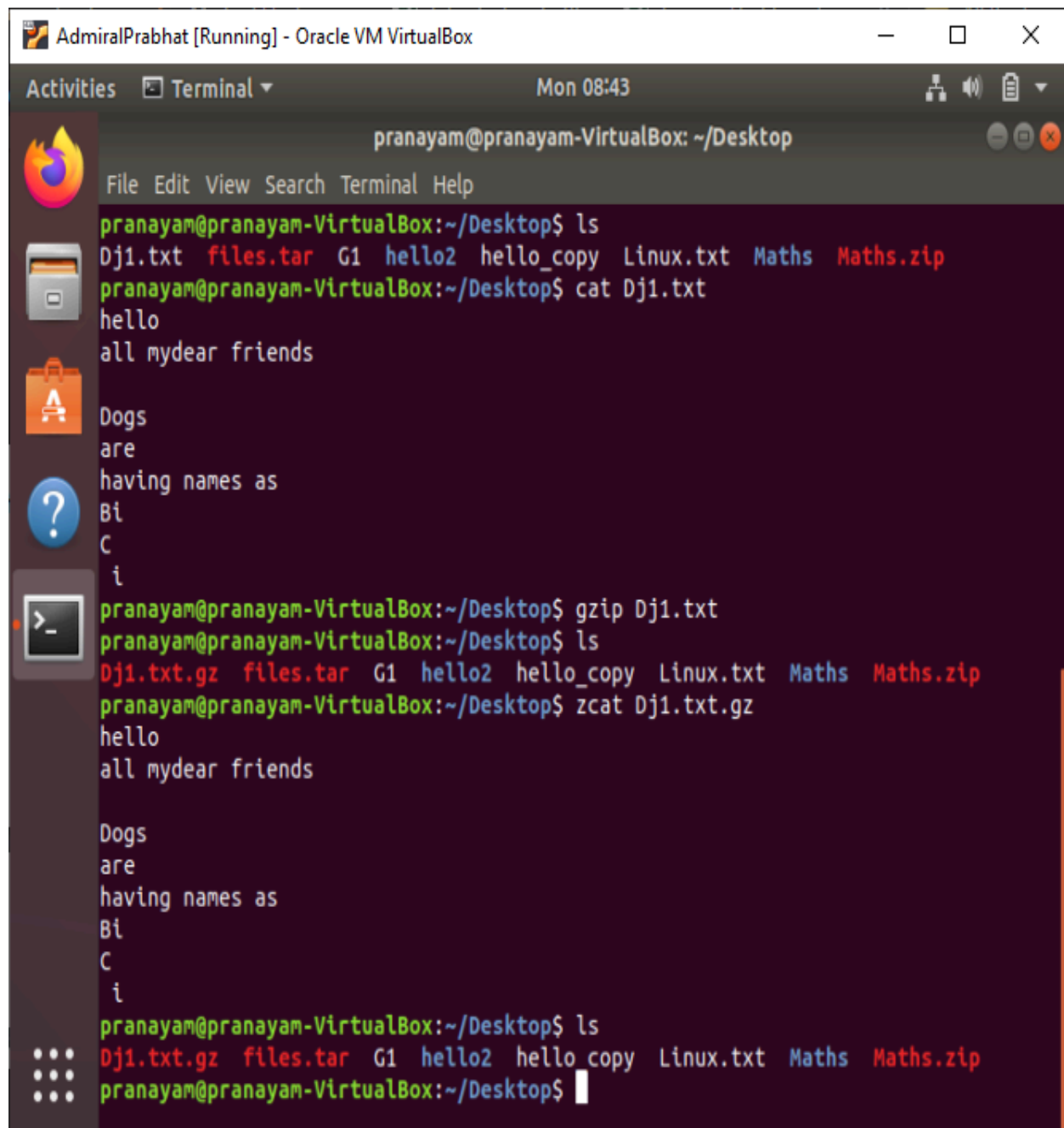
27: tar- An archiving utility that helps to store multiple files in a single file and manipulate them.



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The terminal output shows the following commands and results:

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~/Desktop$ ls -l
total 32
-rw-rw-r-- 2 pranayam pranayam 124 Mar 17 23:27 G1
drwxrwxr-x 2 pranayam pranayam 4096 Mar 17 22:25 hello2
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:14 hello_copy
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:10 Linux.txt
drwxrwxr-x 2 pranayam pranayam 4096 Mar 18 00:15 Maths
-rw-rw-r-- 1 pranayam pranayam 164 Mar 18 08:32 Maths.zip
pranayam@pranayam-VirtualBox:~/Desktop$ cd hello2
pranayam@pranayam-VirtualBox:~/Desktop/hello2$ ls
pranayam@pranayam-VirtualBox:~/Desktop/hello2$ cd ..
pranayam@pranayam-VirtualBox:~/Desktop$ tar cfv files.tar hello2
hello2/
pranayam@pranayam-VirtualBox:~/Desktop$ ls -l
total 44
-rw-rw-r-- 1 pranayam pranayam 10240 Mar 18 08:36 files.tar
-rw-rw-r-- 2 pranayam pranayam 124 Mar 17 23:27 G1
drwxrwxr-x 2 pranayam pranayam 4096 Mar 17 22:25 hello2
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:14 hello_copy
-rw-rw-r-- 1 pranayam pranayam 6564 Mar 17 22:10 Linux.txt
drwxrwxr-x 2 pranayam pranayam 4096 Mar 18 00:15 Maths
-rw-rw-r-- 1 pranayam pranayam 164 Mar 18 08:32 Maths.zip
pranayam@pranayam-VirtualBox:~/Desktop$
```

28: zcat - uncompressed a list of files and write the uncompressed data on standard output.



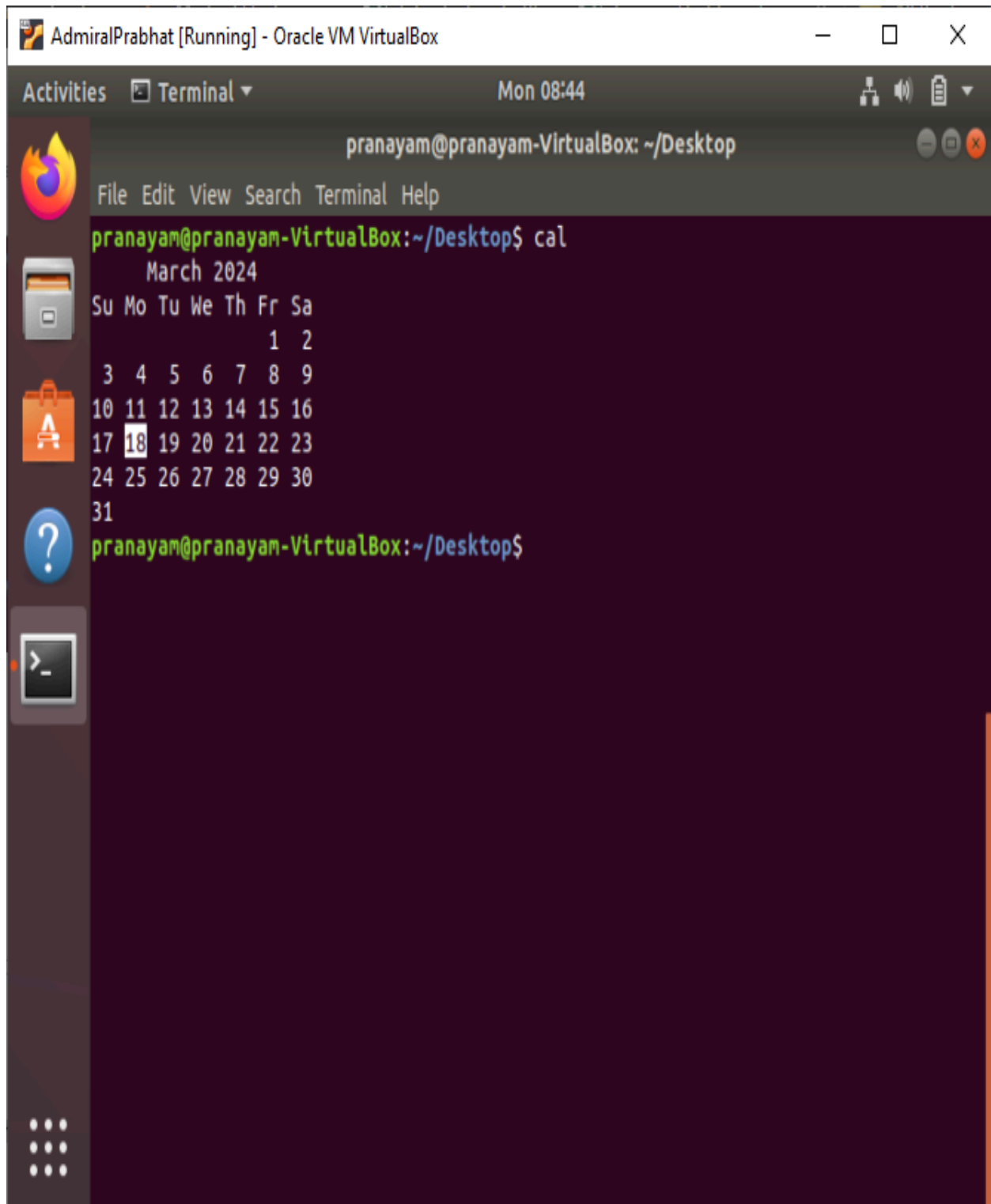
The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal prompt is "pranayam@pranayam-VirtualBox: ~/Desktop". The terminal output shows the following commands and results:

```
pranayam@pranayam-VirtualBox:~/Desktop$ ls
Dj1.txt  files.tar  G1  hello2  hello_copy  Linux.txt  Maths  Maths.zip
pranayam@pranayam-VirtualBox:~/Desktop$ cat Dj1.txt
hello
all mydear friends

Dogs
are
having names as
Bi
C
i
pranayam@pranayam-VirtualBox:~/Desktop$ gzip Dj1.txt
pranayam@pranayam-VirtualBox:~/Desktop$ ls
Dj1.txt.gz  files.tar  G1  hello2  hello_copy  Linux.txt  Maths  Maths.zip
pranayam@pranayam-VirtualBox:~/Desktop$ zcat Dj1.txt.gz
hello
all mydear friends

Dogs
are
having names as
Bi
C
i
pranayam@pranayam-VirtualBox:~/Desktop$ ls
Dj1.txt.gz  files.tar  G1  hello2  hello_copy  Linux.txt  Maths  Maths.zip
pranayam@pranayam-VirtualBox:~/Desktop$
```

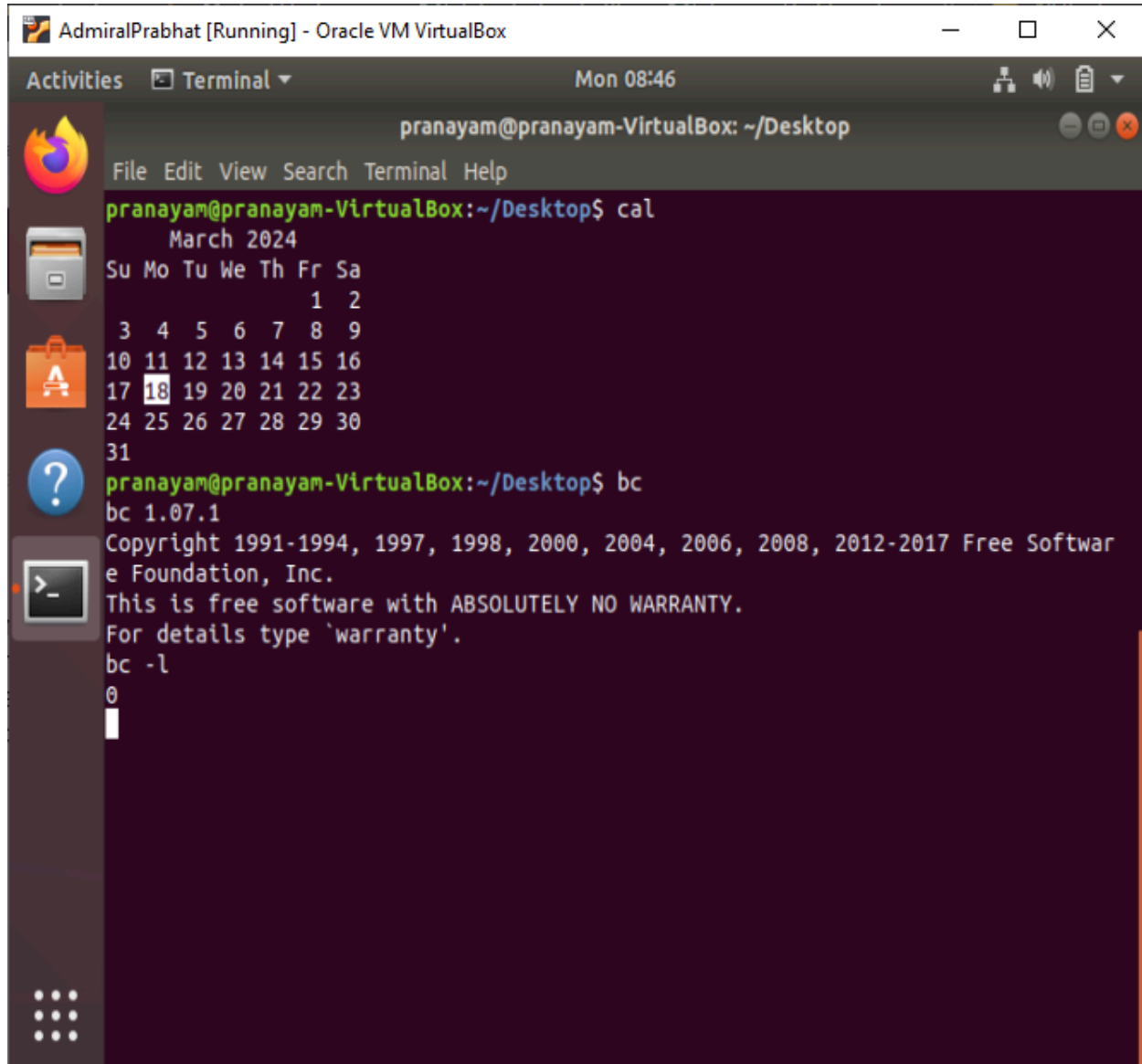
29: cal - displays a calendar with the current date highlighted.



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal displays the command `cal` and its output, which is a calendar for March 2024. The date 18 is highlighted. The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The prompt is `pranayam@pranayam-VirtualBox: ~/Desktop`.

```
pranayam@pranayam-VirtualBox: ~/Desktop$ cal
      March 2024
Su Mo Tu We Th Fr Sa
                1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
pranayam@pranayam-VirtualBox: ~/Desktop$
```

30: `bc` & `bc -l` - `bc` stands for “Basic Calculator” and it launches a basic calculator that can perform basic calculations. The option “-l” loads the standard math library and gives access to more advanced functions like `sin()`, `cos()`, `log()`, `e^x`, etc.



The screenshot shows a terminal window titled "AdmiralPrabhat [Running] - Oracle VM VirtualBox". The terminal is running on a system named "pranayam@pranayam-VirtualBox" with the current directory set to "~/Desktop". The terminal output shows the execution of the `cal` command, which displays the calendar for March 2024. The calendar is a 6x7 grid with days of the week (Su, Mo, Tu, We, Th, Fr, Sa) as columns and dates (1-31) as rows. The date 18 is highlighted. Below the calendar, the `bc` command is executed, displaying the version "1.07.1" and copyright information. The `bc -l` command is also executed, displaying "0".

```
pranayam@pranayam-VirtualBox: ~/Desktop
File Edit View Search Terminal Help
pranayam@pranayam-VirtualBox:~/Desktop$ cal
      March 2024
Su Mo Tu We Th Fr Sa
                1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
pranayam@pranayam-VirtualBox:~/Desktop$ bc
bc 1.07.1
Copyright 1991-1994, 1997, 1998, 2000, 2004, 2006, 2008, 2012-2017 Free Software
Foundation, Inc.
This is free software with ABSOLUTELY NO WARRANTY.
For details type 'warranty'.
bc -l
0
```

