OC - Fall 2018 (IIIT Sri City)
Practice Assignment 1

Q-1. Convert from Binary to Decimal

a) $(1001101)_2 = (77)_{10}$

	$* 2^6$	$* 2^5$	$* 2^4$	$* 2^3$	$* 2^2$	$* 2^1$	$* 2^0$
Number	1	0	0	1	1	0	1

Q-2. Convert from Decimal to Binary

a) $(1539)_{10} = (11000000011)_2$

		Rem
2	1539	
2	769	1
2	384	1
2	192	0
2	96	0
2	48	0
2	24	0
2	12	0
2	6	0
2	3	0
	1	1

Q-3. Convert the following binary numbers to decimal:

Binary numbers										Decimal Equivalent
	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^{-1}	2^{-2}	
a			1	1	1	1	1			31
b		1	0	1	1	0	1			45
c	1	1	0	0	0	1	1			99
d					1	0	1			5
e							0.	1	1	0.75
f					1	0	1.	1	1	5.75
g				1	0	1	0			10
h			1	0	1	0	1			20
i		1	0	1	0	1	0			40

Q-4. Looking at your working in 3g-h, in general, if B is some binary number (such as 1010_2), what number do you get when you attach a zero at the right end (such as 10100_2). What number do you get when you attach 2 zeros at the right end? In general, what number do you get when you attach n zeros at the right end?

Answer- If we add one zero at right end of the binary number, its decimal equivalent becomes double. If we add 2 zeroes, its decimal equivalent becomes 4 times of the original decimal equivalent.

Now in general, if we add n zeroes at the right end of the binary number, then its decimal equivalent gets multiplied with 2^n.

Q-5. Counting in different number systems. Complete a table of the decimal values from 0 through 18 written in the following bases: Binary, Octal, and Hex-

Binary	Octal	Decimal	Hex
00000	0	0	0
00001	1	1	1
00010	2	2	2
00011	3	3	3
00100	4	4	4
00101	5	5	5
00110	6	6	6
00111	7	7	7
01000	10	8	8
01001	11	9	9
01010	12	10	A
01011	13	11	B
01100	14	12	C
01101	15	13	D
01110	16	14	E
01111	17	15	F
10000	20	16	10
10001	21	17	11
10010	22	18	12

Q-6. Complete the following table. For octal - binary conversions, each octal digit is represented by 3 binary digits. For hexadecimal - binary conversions, each hexadecimal digit is represented by 4 binary digits.

BINARY	OCTAL	DECIMAL	HEX
100110110101	4665	2485	9B5
11111011100	3734	2012	7DC
1010110100	1264	692	2B4

Q-7. Write the code for the following ASCII characters. Show binary, hex and decimal values.

Hex	C	43	c	63
Binary	C	1000011	c	1100011
Decimal	C	67	c	99
Hex	Y	59	y	79
Binary	Y	1011001	y	1111001
Decimal	Y	89	y	121

Q-8. Fill in the following binary values table. This exercise is designed to help students understand the effect of the size of a number on both the magnitude of a number and the number of values which can be represented.

Unit	Number of Bits(n)	Largest Number(2^n-1)	Number of values(2^n)
Bit	1	1	2
2 Bit	2	3	4
Nibble	4	15	16
Byte	8	255	256
1 K	10	1023	1024
2 bytes	16	65535	65536
3 bytes	24	16777215	16777216
Full word * (Signed Long)	32	4294967295	4294967296

* Just give the largest positive number and the number of positive values.

Q-9. Write a table of all the possible values of a 4 bit signed binary number. Start off with +7 at the top and continue down to -8.

Value	Signed binary	Value	Signed binary
+7	0111	-1	10001
+6	0110	-2	10010
+5	0101	-3	10011
+4	0100	-4	10100
+3	0011	-5	10101
+2	0010	-6	10110
+1	0001	-7	10111
+0	0000	-8	11000

Q-10. Represent 0.78125, 1.25, and 78.725 in binary.

Answer - a) $(0.78125)_{10} = (0.11001)_2$

	Integer	**Fraction**
0.78125 x 2	1	0.5625
0.5625 x 2	1	0.125
0.125 x 2	0	0.25
0.25 x 2	0	0.5
0.5 x 2	1	0.0

b) $(1.25)_{10} = (1.01)_2$

For fractional part -

	Integer	**Fraction**
0.25 X 2	0	0.5
0.5 X 2	1	0.0

For integral part - $(1)_{10} = (1)_2$

Adding them together $(1.25)_{10} = (1.01)_2$

c) $(78.725)_{10} = (1001110.10111001100)_2$

For fractional part -

	Integer	**Fraction**
0.725 X 2	1	0.45
0.45 X 2	0	0.9

0.9 X 2	1	0.8
0.8 X 2	1	0.6
0.6 X 2	1	0.2
0.2 X 2	0	0.4
0.4 X 2	0	0.8
0.8 X 2	1	0.6
0.6 X 2	1	0.2
0.2 X 2	0	0.4
0.4 X 2	0	0.8

For integral part -

		Rem
2	78	
2	39	0
2	19	1
2	9	1
2	4	1
2	2	0
	1	0

Adding them together $(78.725)_{10} = (1001110.10111001100)_2$

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Practice Assignment 2

Q-1. Use the “man” command to get help for the “ls” command. What command did you type?

Answer- I have typed “man ls” command in the terminal. Command “man” helps in generating the manual pages for that particular command.

Q-2. Execute the following command: **ls > output.1**

What are the contents of **"output.1"**?

Answer- The content of the file output.1 includes the names of all files and directories included in home directory.

Q-3. Execute the following commands:

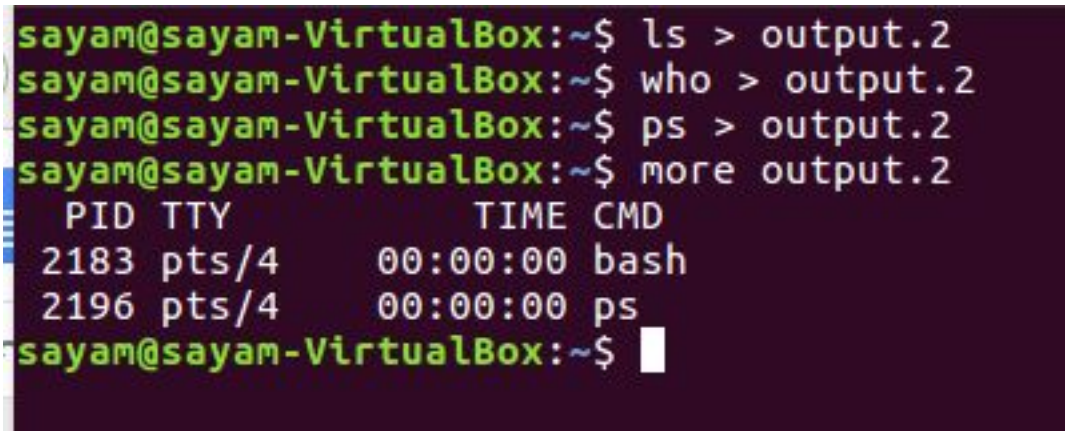
ls > output.2

who > output.2

ps > output.2

Use more to check the contents of "output.2".

Answer- As we are using output redirection meta-character, it overwrites the content of output.2. So the final content of output.2 is shown below-



Q-4. Execute the following commands:

ls > output.3

who >> output.3

ps >> output.3

What is the contents of output.3? The output of all three commands.

Answer- The output of all the three commands gets added each time in the file output.3.

```
sayam@sayam-VirtualBox:~$ ls > output.3
sayam@sayam-VirtualBox:~$ who >> output.3
sayam@sayam-VirtualBox:~$ ps >> output.3
sayam@sayam-VirtualBox:~$ cat output.3
big.file
Desktop
Documents
Dog
Downloads
exp
Music
output.1
output.3
Pictures
Programs
sayam
Templates
Videos
sayam    tty7         2018-11-01 23:23 (:0)
  PID TTY          TIME CMD
 2455 pts/4    00:00:00 bash
 2546 pts/4    00:00:00 ps
sayam@sayam-VirtualBox:~$
```

Q-5. What “ls” option displays the size of files in blocks (other than -l option, for long listing)?

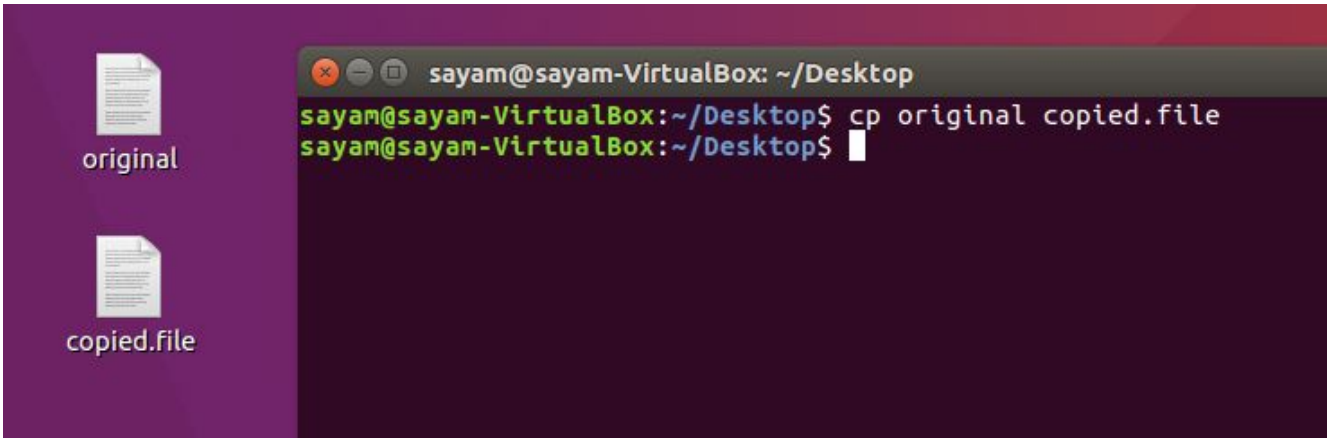
Answer- “-s ” option with ls displays the size of files in blocks.

```
sayam@sayam-VirtualBox:~$ ls -s
total 52
 4 c             4 Downloads           4 Pictures    4 testdir
 4 Desktop      12 examples.desktop    4 Public      4 Videos
 4 Documents     4 Music               4 Templates
```

This is the output I have got while giving ls -s command in my home directory.

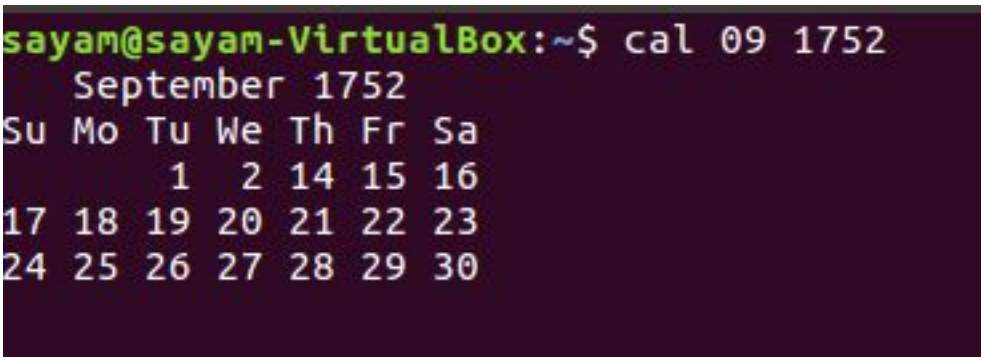
Q-6. What command would you use to make a copy of a file (whose name is **original**) with the name of the copy to be **copied.file**?

Answer- I have used the command “cp original copied.file” for this purpose.



Q-7. Issue the UNIX command **cal 09 1752**. What happens?

Answer- Terminal displays the calendar of the 09 month i.e. September of the year 1752. Here is the output.



Q-8. What do you do to change your login password?

Answer- Type the command “passwd” in the terminal. First it will ask the current password and directs to enter new password and the retype the new password for confirmation. Terminal turns off the echo of the keyboard during this process.

```
sayam@sayam-VirtualBox:~$ passwd
Changing password for sayam.
(current) UNIX password:
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
sayam@sayam-VirtualBox:~$
```

Q-9. Find commands that show who is logged onto the system you are on. What commands will do this?

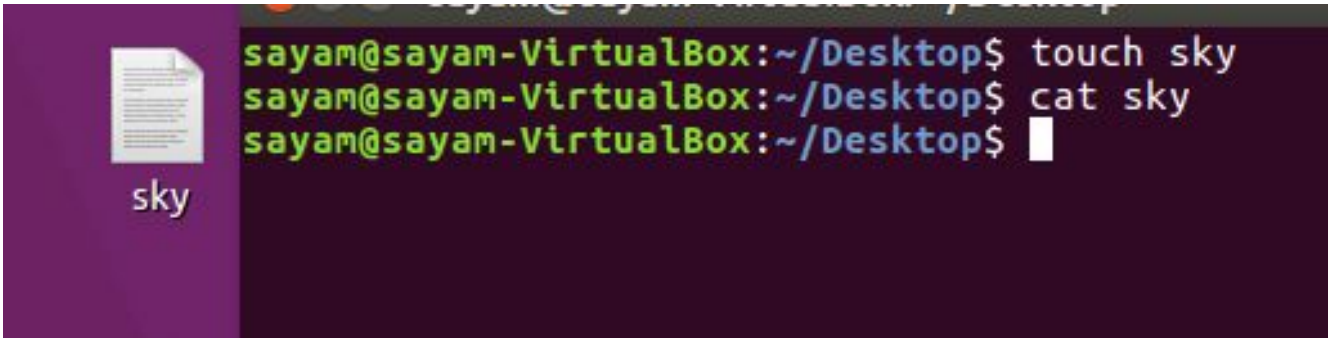
Answer- Four commands- “w” , “whoami” , “users” , and “who -u” served our purpose. All these four commands displayed the user sayam as I am the only one who use this ubuntu.

```
sayam@sayam-VirtualBox:~$ w
 14:24:19 up 56 min,  1 user,  load average: 1.45, 1.37, 1.62
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
sayam    tty7     :0               13:28   56:20  10:17   0.26s /sbin/upstart --us
sayam@sayam-VirtualBox:~$ whoami
sayam
sayam@sayam-VirtualBox:~$ users
sayam
sayam@sayam-VirtualBox:~$ who -u
sayam    tty7         2018-10-21 13:28 00:56        1156 (:0)
sayam@sayam-VirtualBox:~$
```

Q-10. The touch command can be used to create new, empty files. Use the following command to create a file named sky: **touch sky**

What command will show you if you succeeded and the file sky now exists?

Answer- After creating a new empty file, I have used “**cat sky**” command to know the existence of our file but it shows nothing as there is no content in “sky” file.



Q-11. Attempt to create three empty files with the commands:

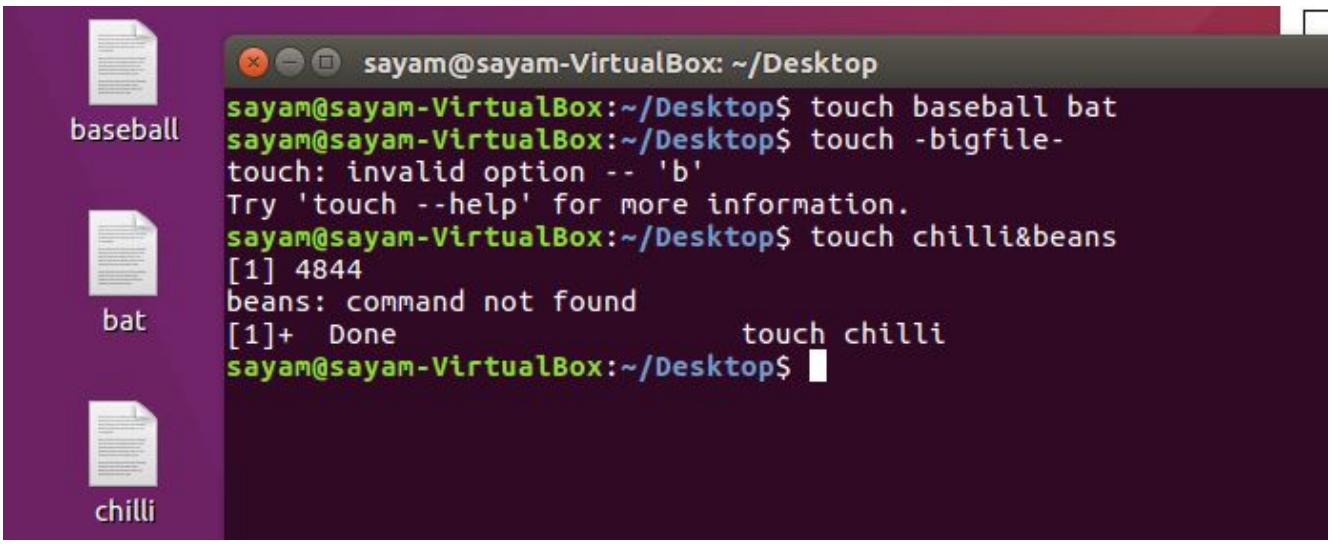
touch baseball bat

touch -bigfile-

touch chili&beans

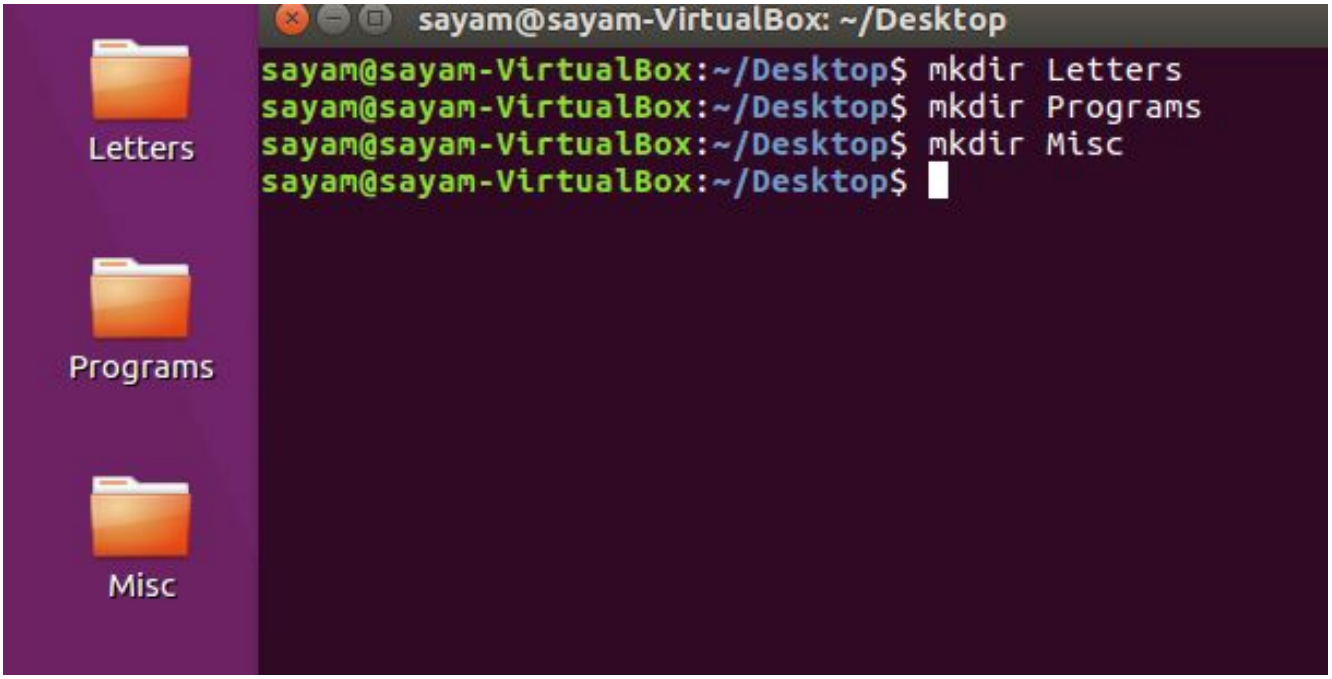
What error messages occur and are any files created?

Answer- Using the first command "**touch baseball bat**", two new files with names baseball and bat have been created. If we want to create a new file having a space in its name, then use the command "touch baseball\ bat". Terminal shows error while executing the second command. For third command, it creates file chilli and simultaneously shows error for beans.



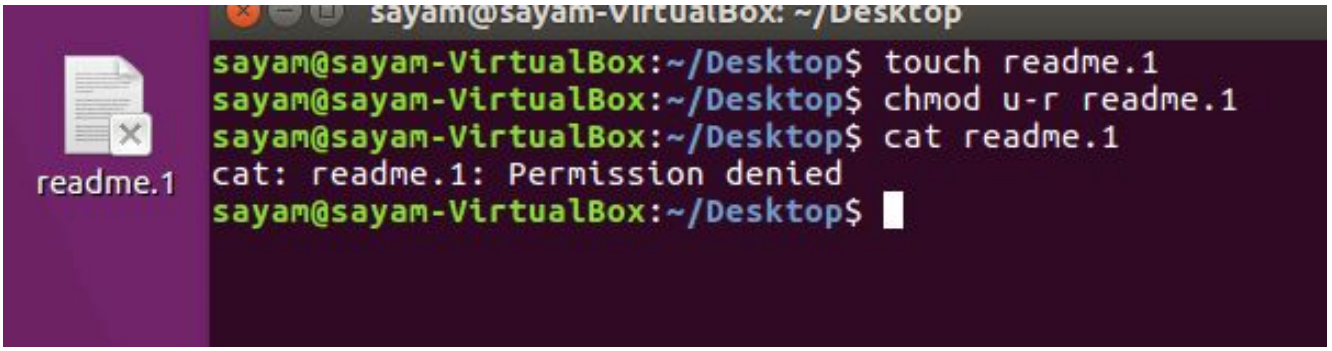
Q-12. Create three new directories in the UNIX class directory; "Letters", "Programs", and "Misc", if they do not already exist.

Answer-



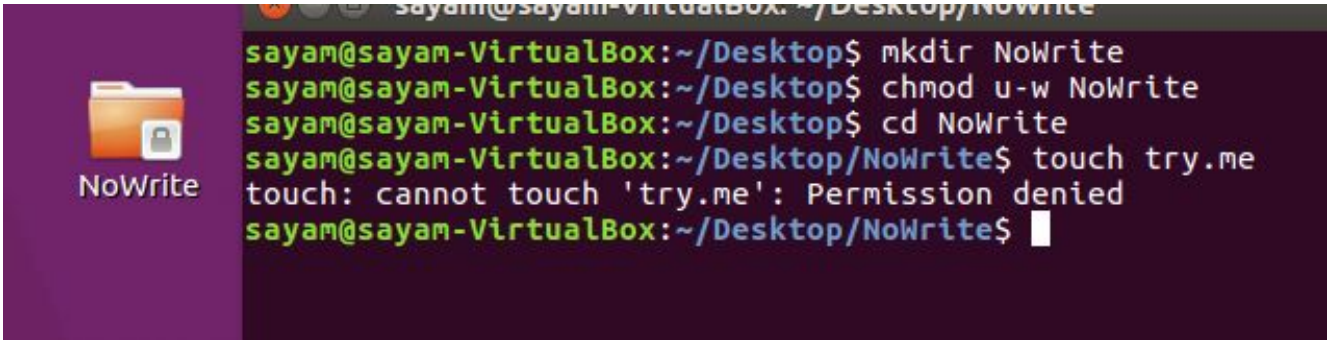
Q-13. Create a file readme.1 and remove its read permission for the user. Try to run cat readme.1?

Answer- The command “chmod u-r readme.1” removes the read permission for the user. Then the user can not read its contents using cat command. That’s why, it shows permission denied.

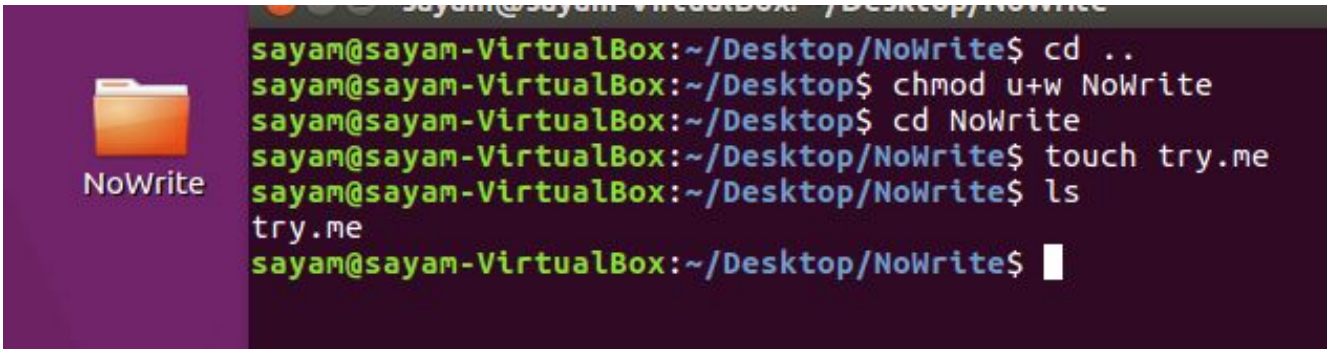


Q-14. a) Create a directory NoWrite and remove its write permission for the user. cd into the NoWrite directory. Create a new file, named try.me, using the command touch try.me. Observe the output.
b) Use cd to go back up one level. What is one command that will change the permissions on the NoWrite directory to allow the creation of files.

Answer- a) We can create new files or directories in a directory or delete its contents if we have write permission of that directory. If we remove that permission, we cannot create new files.

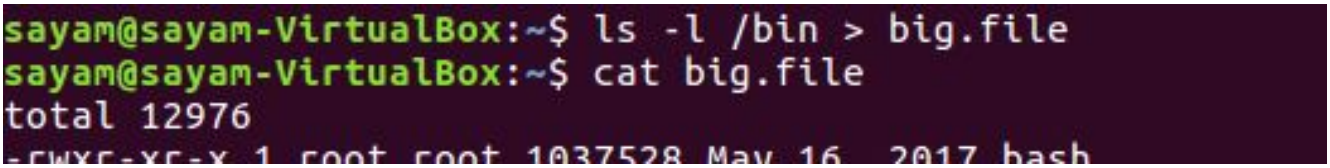


b) “chmod u+w NoWrite” command serves our purpose for creation of new files.



Q-15. ls –l /bin > big.file
a) Issue the following command: cat big.file
b) Now issue the following command: more big.file
c) Observe the difference between the commands "cat" and "more"?
d) How many lines in big.file contain the character string "bash"? What command did you use?

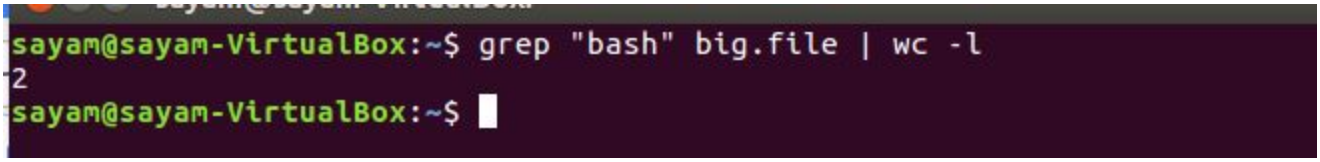
Answer- a) After issuing the “cat big.file” command, it displays the whole content of big.file on the terminal. A long list of utility commands appears as its content.



b) The command “more” also displays the content of the big.file.

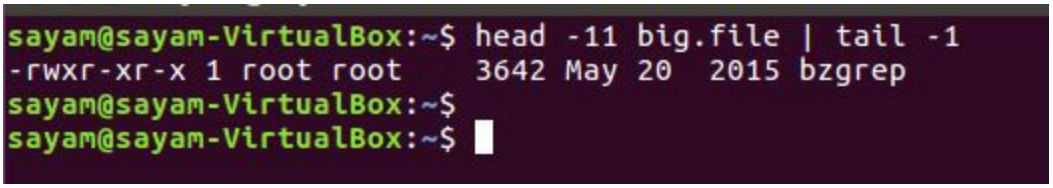
c) The command “more” displays a particular percentage of the content which can be read further by space whereas the “cat” command displays the whole content of the file.

d)



Q-16. Use the head and tail command to read the 11th line of a file.

Answer-



Q-17. Write the commands for the following sequences: Create a file “UG1”; Create a directory “IIITS”; Rename “UG1” as “UG1.IIITS”; Move “UG1.IIITS” into “IIITS” directory; Create a directory “IIITS1”; Delete the directories “IIITS” and “IIITS1” with all its content.

Answer- Sequence of commands-

```
sayam@sayam-VirtualBox:~/Desktop$ touch UG1
sayam@sayam-VirtualBox:~/Desktop$ mkdir IIITS
sayam@sayam-VirtualBox:~/Desktop$ mv UG1 UG1.IIITS
sayam@sayam-VirtualBox:~/Desktop$ mv UG1.IIITS IIITS
sayam@sayam-VirtualBox:~/Desktop$ mkdir IIITS1
sayam@sayam-VirtualBox:~/Desktop$ rm -r IIITS1 IIITS
sayam@sayam-VirtualBox:~/Desktop$
```

Q-18. What will be the difference between the output of the “ls –l” and “ls –dl” Commands?

Answer- The command “ls -l” generates the output containing detailed long list form of all files and directories in the present working directory whereas the command “ls -dl” gives the information about the present working directory.

Q-19. a) There are two text files file_a and file_b. Write a command to display the total number of words in both the files.

b) Write a command to display the list of directories to be searched in your system to execute a command.

Answer- a) Sequence of commands-

```
sayam@sayam-VirtualBox:~/Desktop$ touch file_a file_b
sayam@sayam-VirtualBox:~/Desktop$ cat > file_a
I live in India.
sayam@sayam-VirtualBox:~/Desktop$ cat > file_b
My name is Sayam Kumar.
sayam@sayam-VirtualBox:~/Desktop$ cat file_a file_b | wc -w
9
sayam@sayam-VirtualBox:~/Desktop$
```

b)

```
sayam@sayam-VirtualBox:~$ echo $PATH
/home/sayam/bin:/home/sayam/.local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/
sbin:/bin:/usr/games:/usr/local/games:/snap/bin
sayam@sayam-VirtualBox:~$
```

Q-20."Hands-on" Questions: Tasks:

a) Change to your ITWS1 directory (if you haven't created a ITWS1 directory, create one in your home directory using the command mkdir ITWS1). Create a directory to be contained in your ITWS1 directory called dir_practice. Change to the dir_practice directory.

b) Create the following directories in your current directory:

Stuff

stuff/morestuff

stuff/morestuff/stillmore

c) Create 3 empty files (filea, fileb, filec) in the following directories as shown below. Issue these commands without changing directories first.

stuff/filea

stuff/morestuff/fileb

stuff/morestuff/stillmore/filec

Challenge: can you issue a single unix command to accomplish all three tasks?

d) From your home directory, enter "ls -R". What information does this give you?

e) Create a file called stuff/mystuff using the cat command. This file should contain the following contents:

If you can read this message,
you have accessed my account
Congratulations...

f) Rename the file "stuff/filea" to be called "stuff/filex". Rename the file "stuff/morestuff/fileb" to be called "stuff/morestuff/stillmore/filec" but issue a command to prompt you if that file already exists. If the file called "stuff/morestuff/stillmore/filec" already exists, answer "n" to the prompt.

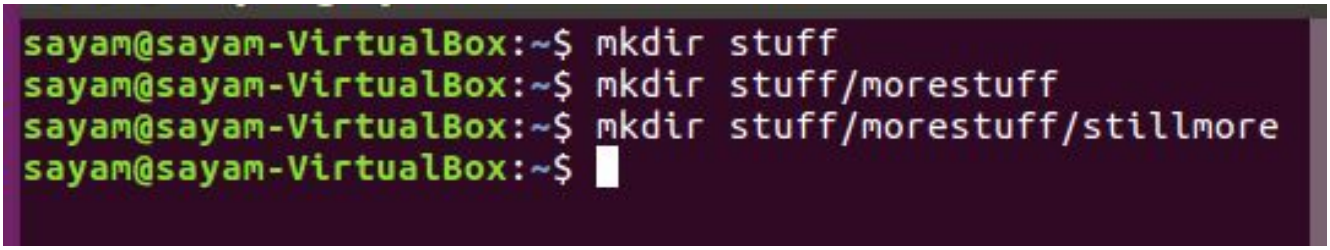
g) Make a copy of the file "stuff/filex" to be called "filex.bak" to be contained in your home directory.

h) Delete your stuff directory and everything that it contains. Be sure to have the

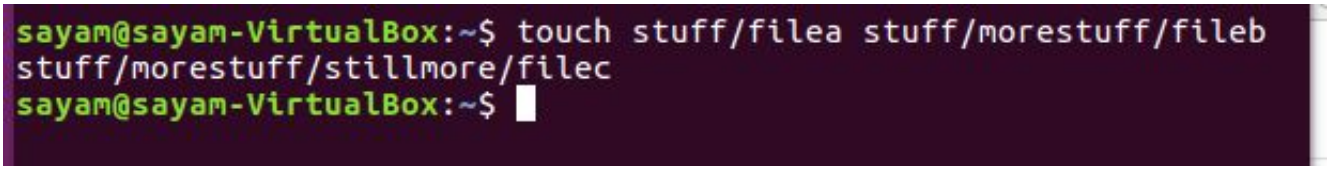
system prompt you to delete each subdirectory and its contents. Answer "y" to the prompts.

Answer-a) Sequence of commands-

b) Sequence of commands-



c) Command-



d) The command “ls -R” gives the names of all files and directories along with their all sub-contents.

e) Command-

```
sayam@sayam-VirtualBox:~$ cat >  stuff/mystuff
If you can read this message,
you have accessed my account
Congratulations...
```

f) Command-

```
sayam@sayam-VirtualBox:~$ mv -i  stuff/morestuff/fileb stuff/morestuff/stillmore/filec
mv: overwrite 'stuff/morestuff/stillmore/filec'? n
sayam@sayam-VirtualBox:~$
```

g) Sequence of commands-

```
sayam@sayam-VirtualBox:~$ mv stuff/filex ./filex.bak
sayam@sayam-VirtualBox:~$ ls
c         Documents  examples.desktop  ITWS1  Pictures  stuff      testdir
Desktop   Downloads  filex.bak         Music  Public    Templates  Videos
sayam@sayam-VirtualBox:~$
```

h) Sequence of commands-

```
sayam@sayam-VirtualBox:~$ rm -ri stuff
rm: descend into directory 'stuff'? y
rm: descend into directory 'stuff/morestuff'? y
rm: descend into directory 'stuff/morestuff/stillmore'? y
rm: remove regular empty file 'stuff/morestuff/stillmore/filec'? y
rm: remove directory 'stuff/morestuff/stillmore'? y
rm: remove regular empty file 'stuff/morestuff/fileb'? y
rm: remove directory 'stuff/morestuff'? y
rm: remove regular file 'stuff/mystuff'? y
rm: remove directory 'stuff'? y
```

OC - Fall 2018 (IIIT Sri City)

Practice Assignment 3

Q-1. List the files in the directory "/bin" that end in "sh". What command did you use?

Answer - “find” command helps in searching all the files with the given condition.

```
sayam@sayam-VirtualBox:~$ cd /bin
sayam@sayam-VirtualBox:/bin$ find *sh
bash
dash
rbash
sh
static-sh
sayam@sayam-VirtualBox:/bin$
```

Q-2. Write the command to list the files in the current directory that begin with upper case letters?

Answer -

```
sayam@sayam-VirtualBox:~$ ls  | grep '^[A-Z]'
Desktop
Documents
Dog
Downloads
Music
Pictures
Programs
Templates
Videos
sayam@sayam-VirtualBox:~$
```

Q-3. Copy all files in the current directory whose names end in ".c" or ".h" into the subdirectory "Programs". What command did you use?

Answer - After creating the directory “Programs”, I have used “cp *.[ch] Programs” to serve our purpose.

```
sayam@sayam-VirtualBox:~$ ls
a.c      Desktop    Downloads  ITWS1  Pictures   Public  Templates
array.c  Documents  export.h   Music  pointer.c  sum.c   Videos
sayam@sayam-VirtualBox:~$ mkdir Programs
sayam@sayam-VirtualBox:~$ cp *.[ch] Programs
sayam@sayam-VirtualBox:~$ ls Programs
a.c  array.c  export.h  pointer.c  sum.c
sayam@sayam-VirtualBox:~$
```

Q-4. Write UNIX command to get all files with r, g or i on the 3rd place.

Answer -

```
sayam@sayam-VirtualBox:~$ ls
a.c      Desktop    Downloads  Music     Pictures   sayam     Videos
array.c  Documents  exp        output.1  pointer.c  sum.c
big.file Dog        export.c   output.3  Programs   Templates
sayam@sayam-VirtualBox:~$ find ??[rgi]*
array.c
big.file
Dog
pointer.c
sayam@sayam-VirtualBox:~$
```

Q-5. Copy all files in the current directory whose names contain the character strings "notes" or "misc" into the subdirectory "Misc". What commands did you use? How to do this using one line of command?

Answer -

```
sayam@sayam-VirtualBox:~$ ls
a.c      Documents  handynotes  misc_program  pointer.c  sum.c
array.c  Downloads  ITWS1       Music         Programs   Templates
Desktop  export.h   misc_photo  Pictures      Public     Videos
sayam@sayam-VirtualBox:~$ mkdir Misc; cp *notes* *misc* Misc
sayam@sayam-VirtualBox:~$ ls Misc
handynotes  misc_photo  misc_program
sayam@sayam-VirtualBox:~$
```

Q-6. Copy all files which begin with "copy.me" into the "UStoreIt" subdirectory. Move all files which begin with "move.me" into the"UStoreIt" subdirectory. What

commands did you use?

Answer -

```
sayam@sayam-VirtualBox:~$ ls
a.c             Desktop    handynotes  misc_program  pointer.c  Templates
array.c         Documents  ITWS1       move.me_sir   Programs   Videos
copy.me_file    Downloads  Misc        Music         Public
sayam@sayam-VirtualBox:~$ mkdir UStoreIt; cp copy.me* UStoreIt; mv move.me* UStoreIt;
sayam@sayam-VirtualBox:~$ ls UStoreIt
copy.me_file  copy.me_program  move.me_sir
sayam@sayam-VirtualBox:~$
```

Q-7. Delete all files which contain the sequence "del". What command did you use?

Answer -

```
sayam@sayam-VirtualBox:~$ ls
a.c       delete.c    Documents  exp       output.1  pointer.c  sum.c
array.c   deliberate  Dog        export.c  output.3  Programs   Templates
big.file  Desktop     Downloads  Music     Pictures  sayam      Videos
sayam@sayam-VirtualBox:~$ rm `find *del*`
sayam@sayam-VirtualBox:~$ ls
a.c       Desktop    Downloads  Music     Pictures  sayam      Videos
array.c   Documents  exp        output.1  pointer.c  sum.c
big.file  Dog        export.c   output.3  Programs   Templates
sayam@sayam-VirtualBox:~$
```

Q-8. What will be the output of the following command sequences:

a. `echo x=4`; echo $x
b. eval `echo x=4`; echo $x

Answer- `echo x=4` gets evaluated in the subshell and its value is gone as sushell finishes its job. The command “eval” evaluates the expression and the value x=4 gets assigned and printed.

```
sayam@sayam-VirtualBox:~$ `echo x=4`; echo $x
No command 'x=4' found, did you mean:
 Command 'x64' from package 'vice' (multiverse)
x=4: command not found
4
sayam@sayam-VirtualBox:~$ eval `echo x=4`; echo $x
4
sayam@sayam-VirtualBox:~$
```

Q-9. Create a variable "Age" and assign some values. Open a new subshell by typing bash. Try to run the command echo $Age. Are you able to access the value of "Age" assigned by parent shell? If not, how to access it?

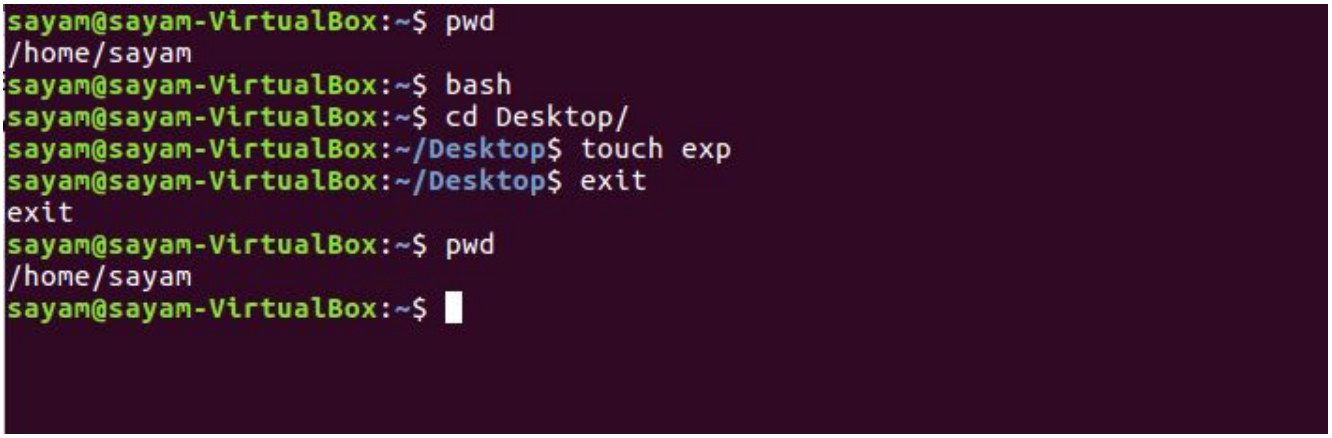
Answer - We cannot access the local variables of the parent shell in its child shell. To do this, use the command “export Age”.

```
sayam@sayam-VirtualBox:~$ Age=45
sayam@sayam-VirtualBox:~$ bash
sayam@sayam-VirtualBox:~$ echo $Age

sayam@sayam-VirtualBox:~$ exit
exit
sayam@sayam-VirtualBox:~$ export Age
sayam@sayam-VirtualBox:~$ bash
sayam@sayam-VirtualBox:~$ echo $Age
45
sayam@sayam-VirtualBox:~$ exit
exit
sayam@sayam-VirtualBox:~$
```

Q-10. What will be the effect over current directory of parent shell if subshell is changing the current directory? Test with example.

Answer - There will be no effect if we change the current working directory of the subshell. It is also clear form the example-



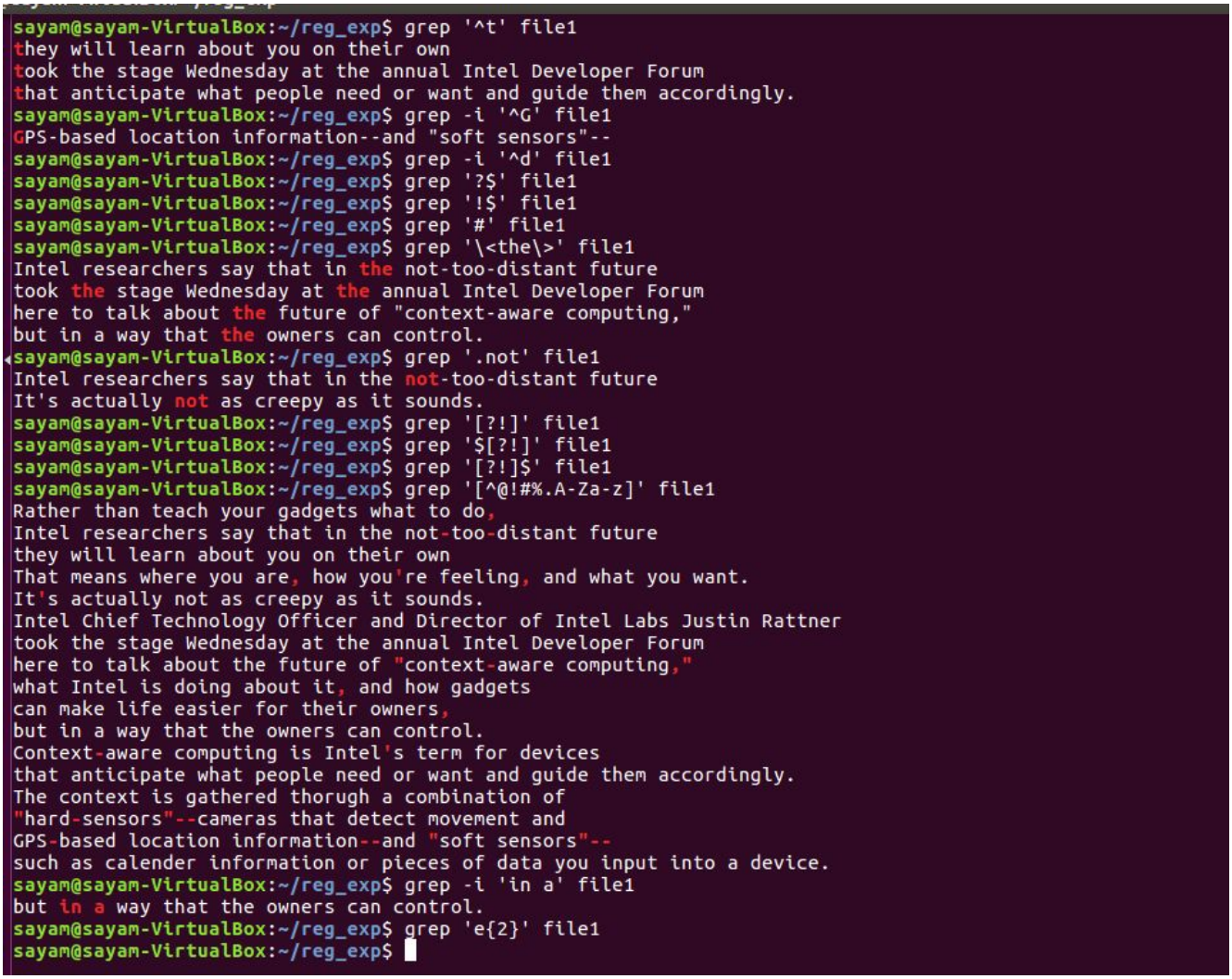
Q-11. Write the command needed for the below mentioned actions:

Action	Command Needed
A. Change to your home directory	cd ~
B. Make a directory named public_html	mkdir public_html
C. Allow group and others to be able to read and execute on your home directory	chmod go+rx ~
D.Allow group and others to be able to read and execute on the public_html directory	chmod go+rx public_html
E.Verify the permissions on your home directory and on public_html	ls -dl; ls -dl public_html
F. Use touch to create an empty file named index.html in the public_html directory	touch public_html/index.html
G. Allow group and others to be able to read all files in the public_html directory	sudo chmod go+r -R public_html

H. Verify the permissions of the file(s) in public_html (your home page files)	ls -l public_html

Q-12. Regular Expression examples using "grep". Create a directory called reg_exp, then create a file file1 to the new directory as follows: After typing the content of the file1, the output of grep commands are as follows:

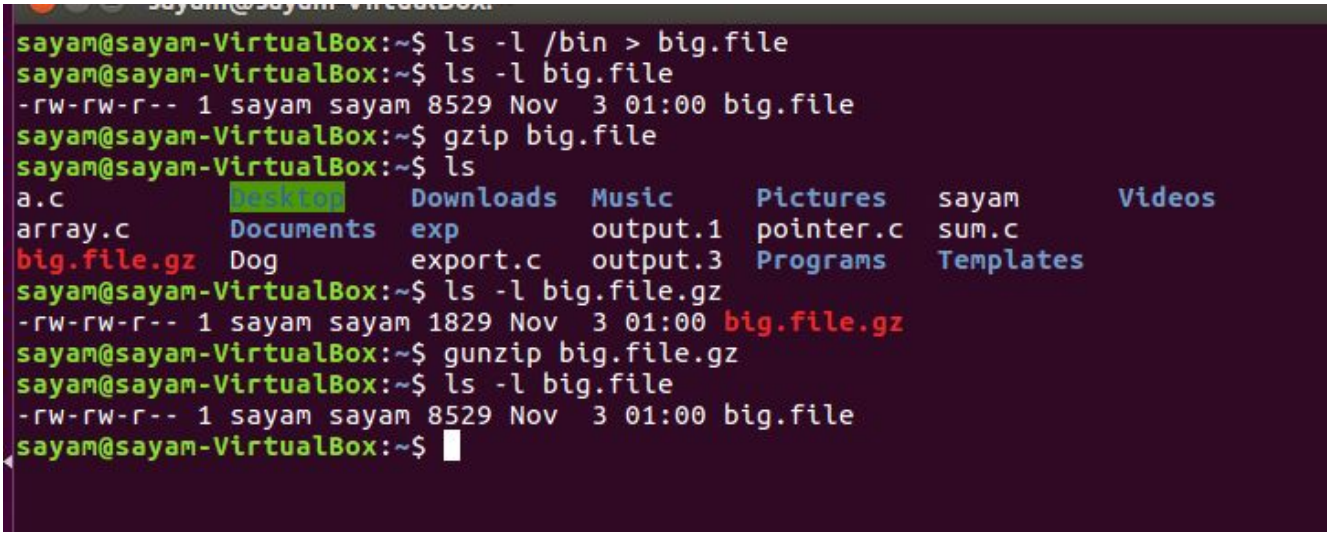
Answer -



Q-13. Create a big file "big.file". Check and note the size of the file "big.file" (hint use "ls-s"). Reduce it with gzip and check the size of "bigfile.gz". Notice the size

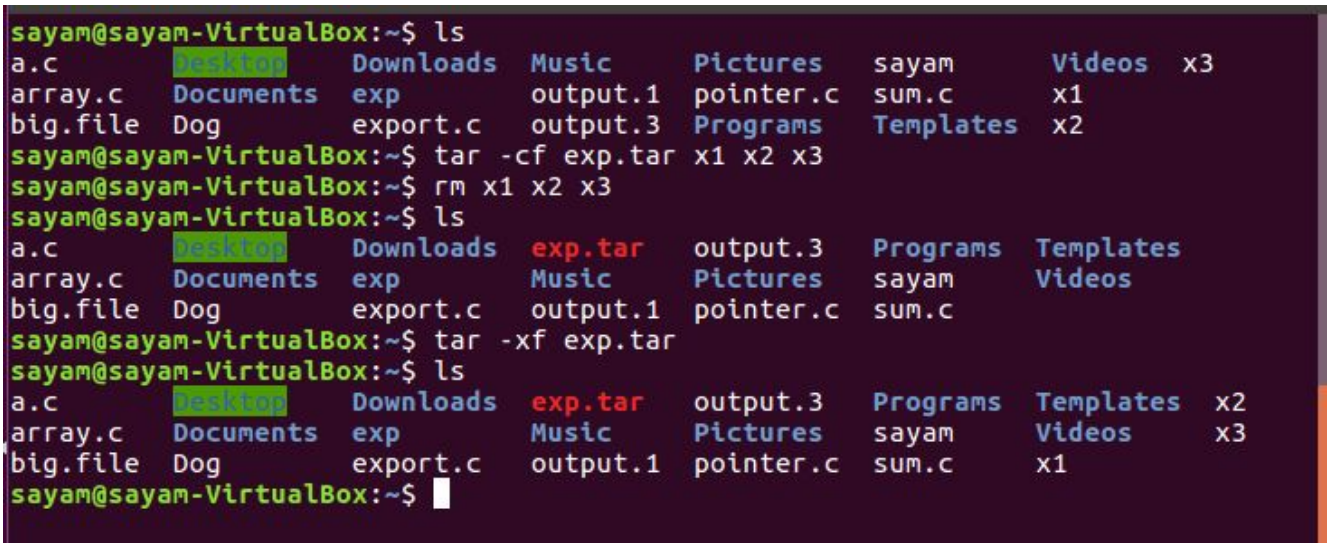
of zipped version? Restore the file with gunzip.

Answer -



Q-14. Use tar to zip multiple files into one and then unzip it.

Answer -



Q-15. Create a pipeline one step at a time, you will add one command to the pipeline in each step, and notice how the output changes.

a) Begin with a single command, "ps", with the options for a full listing of every process: **ps -fe**

b) Use command line editing to add more, to display the output one screenful at a time. You are instructing the shell to take the standard output of ps and feed it

into the standard input of more: **ps-fe | more**

c) Add grep root to filter for the string root. The standard output of ps goes into the standard input of grep, The standard output of grep goes into the standard input of more: **ps-fe | grep "\broot\b" | more**

d) Add sort so the output gets sorted: **ps -fe | grep "\broot\b" | sort | more**

Answer - a)

```
sayam@sayam-VirtualBox:~$ ps -fe
UID          PID  PPID  C STIME TTY          TIME CMD
root           1     0  0 00:23 ?        00:00:01 /sbin/init splash
root           2     0  0 00:23 ?        00:00:00 [kthreadd]
root           4     2  0 00:23 ?        00:00:00 [kworker/0:0H]
root           6     2  0 00:23 ?        00:00:00 [mm_percpu_wq]
root           7     2  0 00:23 ?        00:00:03 [ksoftirqd/0]
root           8     2  0 00:23 ?        00:00:01 [rcu_sched]
root           9     2  0 00:23 ?        00:00:00 [rcu_bh]
root          10     2  0 00:23 ?        00:00:00 [migration/0]
root          11     2  0 00:23 ?        00:00:00 [watchdog/0]
root          12     2  0 00:23 ?        00:00:00 [cpuhp/0]
root          13     2  0 00:23 ?        00:00:00 [kdevtmpfs]
root          14     2  0 00:23 ?        00:00:00 [netns]
root          15     2  0 00:23 ?        00:00:00 [rcu_tasks_kthre]
root          16     2  0 00:23 ?        00:00:00 [kauditd]
root          17     2  0 00:23 ?        00:00:00 [khungtaskd]
root          18     2  0 00:23 ?        00:00:00 [oom_reaper]
root          19     2  0 00:23 ?        00:00:00 [writeback]
root          20     2  0 00:23 ?        00:00:00 [kcompactd0]
```

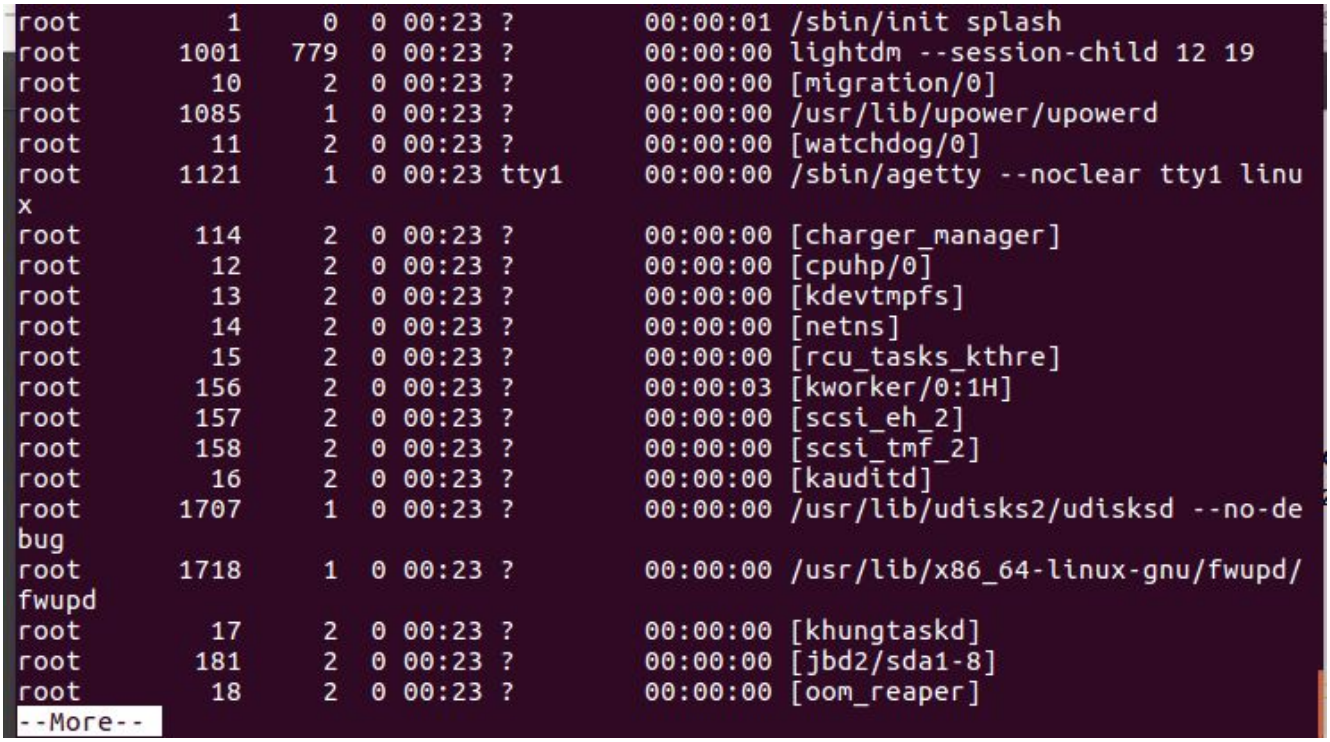
b)

```
UID          PID  PPID  C STIME TTY          TIME CMD
root           1     0  0 00:23 ?        00:00:01 /sbin/init splash
root           2     0  0 00:23 ?        00:00:00 [kthreadd]
root           4     2  0 00:23 ?        00:00:00 [kworker/0:0H]
root           6     2  0 00:23 ?        00:00:00 [mm_percpu_wq]
root           7     2  0 00:23 ?        00:00:03 [ksoftirqd/0]
root           8     2  0 00:23 ?        00:00:01 [rcu_sched]
root           9     2  0 00:23 ?        00:00:00 [rcu_bh]
root          10     2  0 00:23 ?        00:00:00 [migration/0]
root          11     2  0 00:23 ?        00:00:00 [watchdog/0]
root          12     2  0 00:23 ?        00:00:00 [cpuhp/0]
root          13     2  0 00:23 ?        00:00:00 [kdevtmpfs]
root          14     2  0 00:23 ?        00:00:00 [netns]
root          15     2  0 00:23 ?        00:00:00 [rcu_tasks_kthre]
root          16     2  0 00:23 ?        00:00:00 [kauditd]
root          17     2  0 00:23 ?        00:00:00 [khungtaskd]
root          18     2  0 00:23 ?        00:00:00 [oom_reaper]
root          19     2  0 00:23 ?        00:00:00 [writeback]
root          20     2  0 00:23 ?        00:00:00 [kcompactd0]
root          21     2  0 00:23 ?        00:00:00 [ksmd]
root          22     2  0 00:23 ?        00:00:00 [khugepaged]
root          23     2  0 00:23 ?        00:00:00 [crypto]
root          24     2  0 00:23 ?        00:00:00 [kintegrityd]
--More--
```

c)

```
root           1     0  0 00:23 ?        00:00:01 /sbin/init splash
root           2     0  0 00:23 ?        00:00:00 [kthreadd]
root           4     2  0 00:23 ?        00:00:00 [kworker/0:0H]
root           6     2  0 00:23 ?        00:00:00 [mm_percpu_wq]
root           7     2  0 00:23 ?        00:00:03 [ksoftirqd/0]
root           8     2  0 00:23 ?        00:00:01 [rcu_sched]
root           9     2  0 00:23 ?        00:00:00 [rcu_bh]
root          10     2  0 00:23 ?        00:00:00 [migration/0]
root          11     2  0 00:23 ?        00:00:00 [watchdog/0]
root          12     2  0 00:23 ?        00:00:00 [cpuhp/0]
root          13     2  0 00:23 ?        00:00:00 [kdevtmpfs]
root          14     2  0 00:23 ?        00:00:00 [netns]
root          15     2  0 00:23 ?        00:00:00 [rcu_tasks_kthre]
root          16     2  0 00:23 ?        00:00:00 [kauditd]
root          17     2  0 00:23 ?        00:00:00 [khungtaskd]
root          18     2  0 00:23 ?        00:00:00 [oom_reaper]
root          19     2  0 00:23 ?        00:00:00 [writeback]
root          20     2  0 00:23 ?        00:00:00 [kcompactd0]
root          21     2  0 00:23 ?        00:00:00 [ksmd]
root          22     2  0 00:23 ?        00:00:00 [khugepaged]
root          23     2  0 00:23 ?        00:00:00 [crypto]
root          24     2  0 00:23 ?        00:00:00 [kintegrityd]
root          25     2  0 00:23 ?        00:00:00 [kblockd]
--More--
```

d)



Q-16. Create a directory called "ITWS1" by issuing the command **mkdir ITWS1**. Change to your ITWS1 directory by issuing the command **cd ITWS1**. Create a directory called **UNIX**, and change to that directory.

a) Issue a UNIX command (not an editor!) to create a file called stuff that contains the following lines (include the mistakes!!)

Tha cow is mad

I tell you!

I think the cow is looking at me

Terrible news!

I think the cow is looking at me

b) Issue a UNIX command to verify the contents of the file **stuff**

c) Issue a UNIX command to determine the file type of **stuff**

d) Try to issue a series of UNIX commands to take the contents of **stuff** and modify the content (to be saved in the file **stuff.new**) as shown below:

I tell you!

I think the cow is looking at me

Terrible news!

Here is the challenge:

1-you are not permitted to use an editor!

2-You have to issue those commands on just one line!

e) Issue a UNIX command to verify the contents of the file **stuff.new**

f) Issue a UNIX command to change the name of the file stuff.new to stuff, but make sure that the system makes the user confirm overwriting the existing file and select "yes".

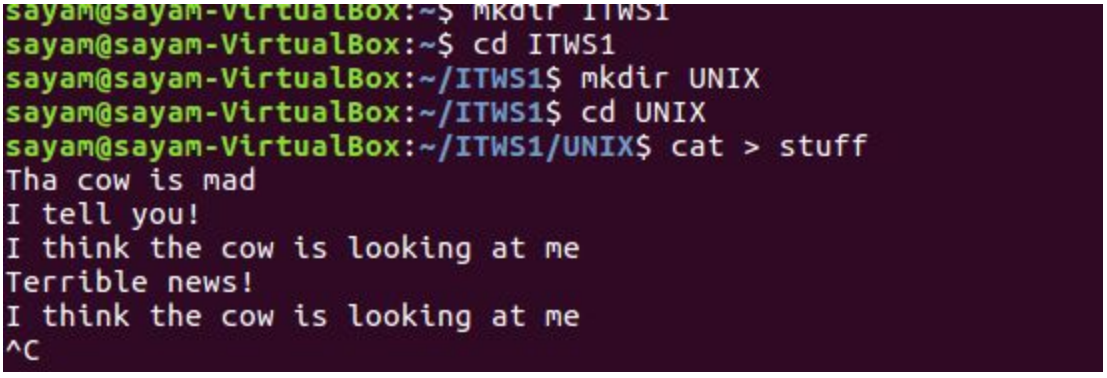
g) Issue a UNIX command to take the contents of the modified file stuff and place into a file called cows lines that only contain the pattern "cow".

h) Issue a UNIX command to take the contents of the modified file stuff and place into a file called not_cows all lines that do not contain the pattern "cow". (Hint: use the online manual to check for an appropriate option).

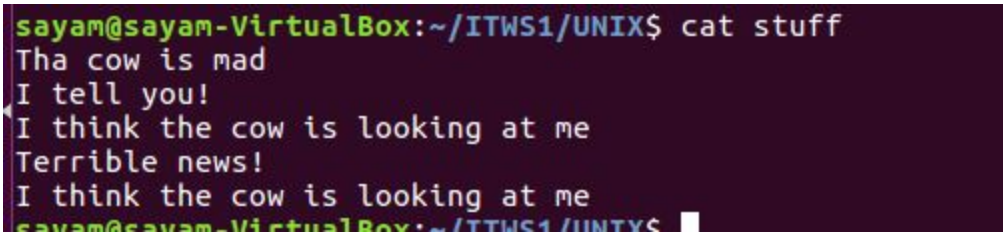
i) Issue a UNIX command to compare the file cows with the file not_cows

j) Issue a UNIX command to compare the file stuff with the file cows. According to the results, what has to be done to the file stuff to make it identical to cows?

Answer - a)



b)



c)

```
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ file stuff
stuff: ASCII text
sayam@sayam-VirtualBox:~/ITWS1/UNIX$
```

d)

```
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ head -4 stuff | tail -3 > stuff.new
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cat stuff.new
I tell you!
I think the cow is looking at me
Terrible news!
sayam@sayam-VirtualBox:~/ITWS1/UNIX$
```

e) - j)

```
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ mv -i stuff.new stuff
mv: overwrite 'stuff'? y
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cat stuff | grep "cow" > cows
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cat cows
I think the cow is looking at me
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cat stuff | grep -v "cow" > not_cows
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cat not_cows
I tell you!
Terrible news!
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cmp cows not_cows
cows not_cows differ: byte 4, line 1
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cmp cows stuff
cows stuff differ: byte 4, line 1
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cat stuff
I tell you!
I think the cow is looking at me
Terrible news!
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ sed '2!d' stuff > temp && mv temp stuff
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cat dtuff
cat: dtuff: No such file or directory
sayam@sayam-VirtualBox:~/ITWS1/UNIX$ cat stuff
I think the cow is looking at me
sayam@sayam-VirtualBox:~/ITWS1/UNIX$
```

Q-17. Create a directory called "file_practice": mkdir -p ~/ITWS1/file_practice.

Use the cd and touch commands to create several empty files:

cd ~/ITWS1/file_practice

touch a1 a11 a12 a23 a123 a1234 a543 a321 bab2 cab5 12abc12 1a1 abc1 abcdef1 1 12 123

Try to guess the output from each of the following commands before issuing

them on the computer. After you have written the answers on paper, issue the command to check your work!

ls

ls *

ls *1*

ls ?

ls ??

file ??

ls ???

ls a[1]

ls a[123456789]

file a[123456789]

ls a[123456789]*

ls [a][1][2]*

file [a][1][2]*

ls [a-z]*3

file [a-z]*3

ls a* [1]

ls a?*[1]

ls *[!1]

(Note: when issuing this command, notice that file names do not end in 1)

Answer -

```
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ touch a1 a11 a12 a123 a1234 a543 a321 bab2 cab5 12abc12 1a1 abc1 abcdef1 1 12 123
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls
1  12  123  12abc12  1a1  a1  a11  a12  a123  a1234  a321  a543  abc1  abcdef1  bab2  cab5
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls *
1  12  123  12abc12  1a1  a1  a11  a12  a123  a1234  a321  a543  abc1  abcdef1  bab2  cab5
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls *1*
1  12  123  12abc12  1a1  a1  a11  a12  a123  a1234  a321  abc1  abcdef1
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls ?
1
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls ??
12  a1
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ file ??
12: empty
a1: empty
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls ???
123  1a1  a11  a12
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls a[1]
a1
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls a[123456789]
a1
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls a[123456789]*
a1  a11  a12  a123  a1234  a321  a543
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls [a][1][2]*
a12  a123  a1234
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ file [a][1][2]*
a12:   empty
a123:  empty
a1234: empty
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls [a-z]*3
a123  a543
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ file [a][1][2]*
a12:   empty
a123:  empty
a1234: empty
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls [a-z]*3
a123  a543
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ file [a-z]*3
a123: empty
a543: empty
sayam@sayam-VirtualBox:~/ITWS1/file_practice$
```

```
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ file [a-z]*3
a123: empty
a543: empty
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls a*[1]
a1  a11  a321  abc1  abcdef1
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls a?*[1]
a11  a321  abc1  abcdef1
sayam@sayam-VirtualBox:~/ITWS1/file_practice$ ls *[!1]
12  123  12abc12  a12  a123  a1234  a543  bab2  cab5
sayam@sayam-VirtualBox:~/ITWS1/file_practice$
```

Q-18. open vi

$ vi

issue the following command

:r! ls

–

la /usr/bin

--

> this is to generate relatively large text

Write the commands to do the following tasks in same sequence:

a. jump to the first line - gg
b. scroll down one page - Ctrl +D
c. delete 5th character from line 60 - 60G llllx
d. add new line after line 60 and input text —previous changed || - 60G o
e. save the text to file —tmp || - :w tmp
f. add —WARNING: || at the beginning of the newly added line - ggi warning:
g. Move word by word to —changed || - b or w
h. replace —changed || with —modified || in the newly added line - dwo modified
i. find —kill || and delete 5 lines after the line containing it - /kill j 0 5dd
j. go to the last line - G
k. delete characters 5 to 20 of the last line - G 51 16x
l. find —bash || - /bash
m. replace all —sh || with —SH || - :%s/sh/SH/g
n. copy all lines from between 50 and 60 into the paste buffer - 60G 11dd
o. paste the content of paste buffer to the end of the file - G p
p. delete the last 10 lines of the file - G 9k 10dd
q. save and quit - :wq
r. open vi with —tmp || - vi tmp
s. change all —baSH || in —tmp || to —bash || - :%s/baSH/bash/g
t. save file - :w