

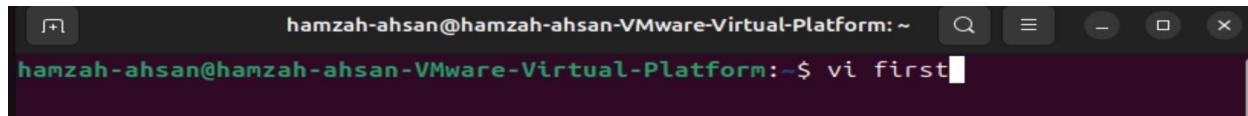
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Course: OS

Lab Task 06

Command: vi first



A screenshot of a terminal window. The title bar shows the user's name and host: "hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform: ~". The main area of the terminal is dark purple, and it displays the command "vi first" in white text. The cursor is positioned at the end of the command.

Creating first file .

Output is coming on top “Knowledge is power”.

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform: ~
```

After saving the above script, you can run the script as follows:

`./first`

- This will not run script since we have not set execute permission for our script `first`; to do this type command
 - `$ chmod 755 first`
 - `$./first`
- First screen will be clear, then Knowledge is Power is printed on screen.
- To delete the character that is currently under the cursor you must press `x` (and you must not be in *Insert* mode because if you are you will insert the character `x` instead of deleting the character under the cursor). So if you have just opened the file with `vi`, you can immediately use `x` to delete characters. If you are in *Insert* mode you have to leave it first with `ESC`.
- If you have made changes and want to save the file, press `:x` (again you must not be in *Insert* mode. If you are, press `ESC` to leave it).

Now we are going to perform some basic commands. **ECHO, WHO AM I, WHO and SORT**. We will also see how to get properties of system.

echo Command:

<u>Command</u>	<u>Description</u>
Echo	Echoes back(print) whatever you type on the command line.

Formatting Echo:

The Color Code: `"\033[{\attr};{\fg};{\bg}m MESSAGE"`

{attr}, {fg}, {bg} have to be replaced with the correct value to get the corresponding effect. **attr** is the attribute like blinking or underlined etc.. **fg** and **bg** are foreground and background colors respectively. You don't have to put braces around the number. Just writing the number will suffice.

{attr} is one of following

0	Reset All Attributes (return to normal mode)
1	Bright (Usually turns on BOLD)
2	Dim
3	Underline
5	Blink
7	Reverse

8 Hidden

{fg} is one of the following

30	Black
31	Red
32	Green
33	Yellow
34	Blue
35	Magenta
36	Cyan
37	White

{bg} is one of the following

40	Black
41	Red
42	Green
43	Yellow
44	Blue
45	Magenta
46	Cyan
47	White

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[31m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[32m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[42m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[43m Hello World"
echo-e: command not found
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[43m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[36m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[35m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

Who Command:

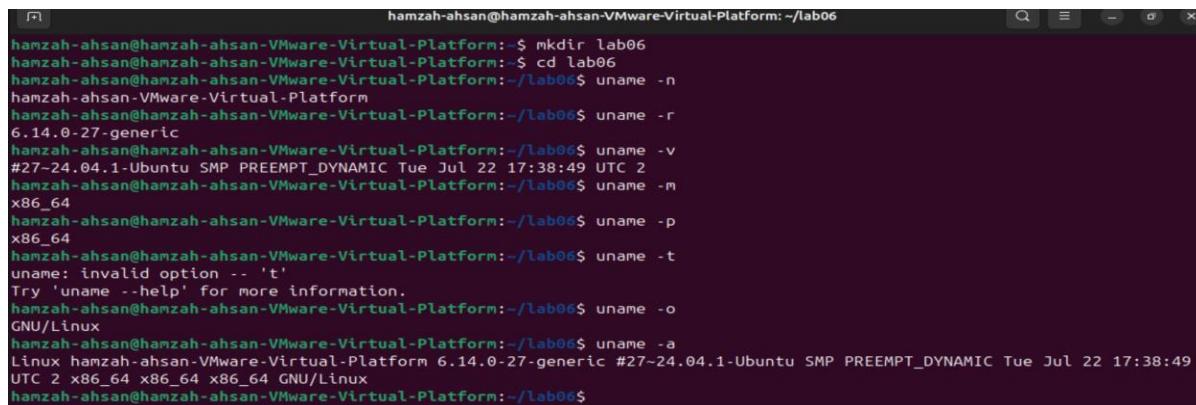
<u>Command</u>	<u>Description</u>
Who	Who command lists the login names, terminal lines, and login times of the users who are currently logged on to the system.

Example:

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ who
hamzah-ahsan seat0 2025-09-29 08:28 (login screen)
hamzah-ahsan tty2 2025-09-29 08:28 (tty)
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

Uname Command:

<u>Command</u>	<u>Description</u>
uname	Print Operating System Name like Linux or Unix system.
Options	You can use following option with uname command -n print the network node hostname -r print the kernel release -v print the kernel version -m print the machine hardware name -p print the processor type or "unknown" -i print the hardware platform or "unknown" -o print the operating system -a print complete information of operating system



The screenshot shows a terminal window with the following session:

```
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~$ mkdir lab06
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~$ cd lab06
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$ uname -n
hamzah-ahsan-Virtual-Platform
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$ uname -r
6.14.0-27-generic
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$ uname -v
#27~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Tue Jul 22 17:38:49 UTC 2
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$ uname -m
x86_64
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$ uname -p
x86_64
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$ uname -t
uname: Invalid option -- 't'
Try 'uname --help' for more information.
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$ uname -o
GNU/Linux
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$ uname -a
Linux hamzah-ahsan-Virtual-Platform 6.14.0-27-generic #27~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Tue Jul 22 17:38:49
UTC 2 x86_64 x86_64 x86_64 GNU/Linux
hamzah-ahsan@hamzah-ahsan-Virtual-Platform:~/lab06$
```

File Sorting:

Sort Command:

<u>Command</u>	<u>Description</u>
sort	Sorts a column in a file in alphabetical order. By default the output is displayed on your terminal, but you can specify filename as the argument or redirect the output to a file.
options	You can use following option with sort command -r Sorts in reverse order -b Ignores leading blanks -f Ignores the distinction between lowercase and uppercase -k Sorts the output by column -n Numbers are sorted by their arithmetic values

Example:

From lab-4, we know how to create files. Now create new file named labsort6 and insert following text

End of file

6 apples

file to be sorted

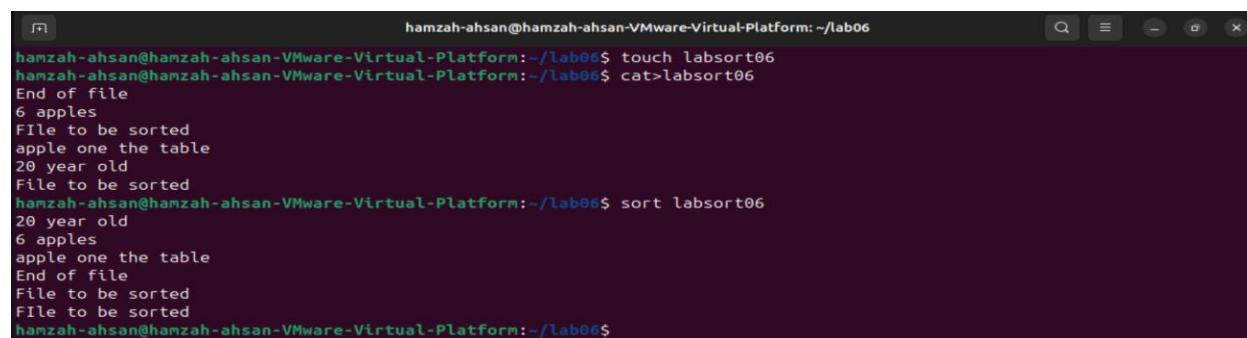
apple on the table

20 years old

File To be Sorted

Now execute:

Command: sort labsort6



```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ touch labsort6
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ cat>labsort6</pre>

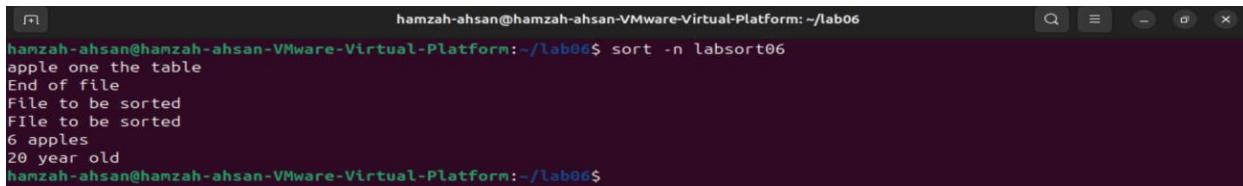
The terminal window shows the following sequence of commands and output:



- touch labsort6 creates an empty file named labsort6.
- cat>labsort6 starts a text input session for the file.
- The user types the following text:
  - End of file
  - 6 apples
  - file to be sorted
  - apple one the table
  - 20 year old
  - File to be sorted
- sort labsort6 sorts the input text. The sorted output is:
  - 20 year old
  - 6 apples
  - apple one the table
  - End of file
  - File to be sorted
  - File to be sorted

```

One column contains numeric values while other contain text. Now perform sorting on both column separately (show both outputs to your instructor). Also perform **-n** switch on both columns again and observe the pattern.



```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/Lab06$ sort -n labsort06
apple one the table
End of file
File to be sorted
File to be sorted
6 apples
20 year old
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/Lab06$
```

===== The END =====

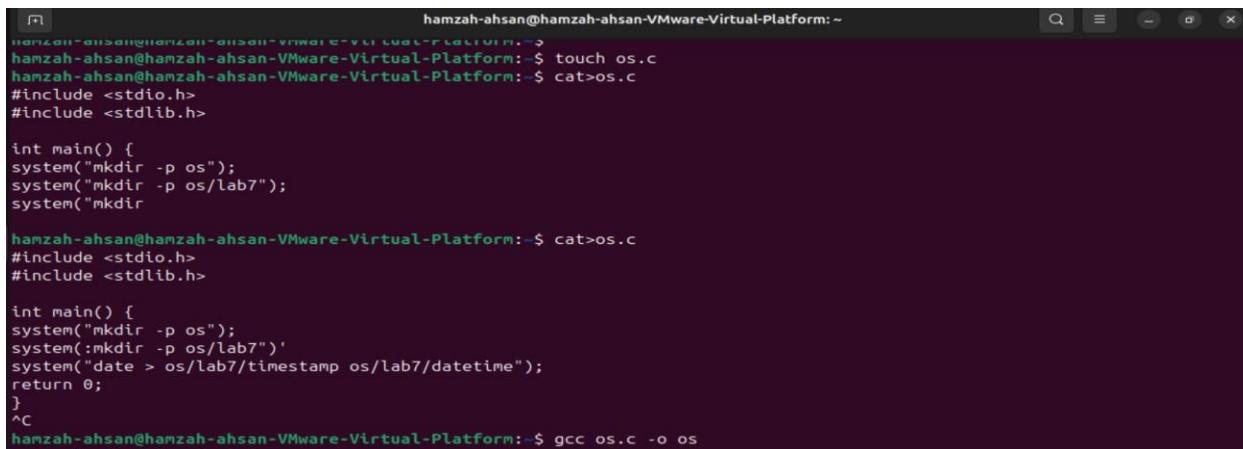
Lab Task 06

1. Task

Write a C program using system call(s) to create

- A directory called “os”.
- Inside “os” create another directory named “lab7” and
- Create a file called “timestamp” in “lab7” directory. The file timestamp must contain the current date and time.
- Make copy of timestamp file with named "datetime".

Your program must perform above four tasks when program executed. (hint: redirection > or < can be used to store date and time in the file).



```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~>
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ touch os.c
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ cat>os.c
#include <stdio.h>
#include <stdlib.h>

int main() {
system("mkdir -p os");
system("mkdir -p os/lab7");
system("mkdir -p os/lab7");

hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ cat>os.c
#include <stdio.h>
#include <stdlib.h>

int main() {
system("mkdir -p os");
system("mkdir -p os/lab7");
system("date > os/lab7/timestamp");
system("cp os/lab7/timestamp os/lab7/datetime");
return 0;
}
^C
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ gcc os.c -o os
```

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ touch os.c
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ cat > os.c
#include <stdio.h>
#include <stdlib.h>

int main() {
    system("mkdir -p os");
    system("mkdir -p os/lab7");
    system("date > os/lab7/timestamp os/lab7/datetime");
    return 0;
}

hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ gcc os.c -o os
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ ./os
mkdir: cannot create directory 'os': File exists
mkdir: cannot create directory 'os': Not a directory
sh: 1: cannot create os/lab7/timestamp: Directory nonexistent
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ ./os
mkdir: cannot create directory 'os': File exists
mkdir: cannot create directory 'os': Not a directory
sh: 1: cannot create os/lab7/timestamp: Directory nonexistent
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

2. Task

Try the following

clear

```
echo -e "\033[1m Hello World"      # bold effect
echo -e "\033[5m Blink"            # blink effect
echo -e "\033[0m Hello World"      # back to normal
echo -e "\033[31m Hello World"     # Red color
echo -e "\033[32m Hello World"     # Green color
echo -e "\033[33m Hello World"      # See remaining on screen
echo -e "\033[34m Hello World"
echo -e "\033[35m Hello World"
echo -e "\033[36m Hello World"
echo -e -n "\033[0m "      # back to normal
echo -e "\033[41m Hello World"
echo -e "\033[42m Hello World"
echo -e "\033[43m Hello World"
echo -e "\033[0m Hello World"      # back to normal
```

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[1m Hello world"
Hello world
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[5m Blink"
Blink
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[0m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[31m Hello WOrld"
Hello WOrld
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[32m Hello WOrld"
Hello WOrld
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[33m Hello Worls"
Hello Worls
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[34m Hello WOrld"
Hello WOrld
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[35m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[36m Hello World"
Hello World
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[41m Hello WOrld"
Hello WOrld
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[42m Hello WOrld"
Hello WOrld
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[43m Hello WOrld"
Hello WOrld
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

3. Task

Print(ls) contents of **/lib/modules** directory by pressing command

ls /lib/modules

Now run following command

uname -r

Note output of both above commands.

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ ls /lib/modules
6.14.0-27-generic
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -r
6.14.0-27-generic
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

4. Task

Run all above switches with uname command.

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname
Linux
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -n
hamzah-ahsan-VMware-Virtual-Platform
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -r
6.14.0-27-generic
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -v
unameunam: command not found
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -m
x86_64
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -p
x86_64
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -i
x86_64
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -o
GNU/Linux
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -a
Linux hamzah-ahsan-VMware-Virtual-Platform 6.14.0-27-generic #27~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Tue Jul 22 17:38:49
UTC 2 x86_64 x86_64 x86_64 GNU/Linux
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

5. Task

Now use other option with sort command and observe output

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ touch labsorted06
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ cat>labsorted06
End of file
Apple 6
apples of one table
20 year old
file to be sorted
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort labsorted06
20 year old
Apple 6
apples of one table
End of file
file to be sorted
```

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort labsorted06 -r
file to be sorted
End of file
apples of one table
Apple 6
20 year old
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort labsorted06 -b
20 year old
Apple 6
apples of one table
End of file
file to be sorted
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort labsorted06 -f
20 year old
Apple 6
apples of one table
End of file
file to be sorted
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort labsorted06 -k2
Apple 6
End of file
apples of one table
file to be sorted
20 year old
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort labsorted06 -n
Apple 6
apples of one table
End of file
file to be sorted
20 year old
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

6. Task

Create another file with two columns in it. like

12 Operation payback

6 Network security

14 Hacking is fun

7 Tiger lives in jungle

13 Pakistan will win today

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ nano file2.txt
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

```
GNU nano 7.2
12 Operation payback
6 Network Security
14 Hacking is fun
7 Tiger lives in jungle
13 Pakistan will win today

File Name to Write: file2.txt
^G Help      M-D DOS Format    M-A Append      M-B Backup File
^C Cancel    M-M Mac Format    M-P Prepend    ^T Browse
```

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort file2.txt
12 Operation payback
13 Pakistan will win today
14 Hacking is fun
6 Network Security
7 Tiger lives in jungle
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort -n file2.txt
6 Network Security
7 Tiger lives in jungle
12 Operation payback
13 Pakistan will win today
14 Hacking is fun
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort -k2 file2.txt
14 Hacking is fun
6 Network Security
12 Operation payback
13 Pakistan will win today
7 Tiger lives in jungle
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort -r file2.txt
7 Tiger lives in jungle
6 Network Security
14 Hacking is fun
13 Pakistan will win today
12 Operation payback
```

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ sort -f file2.txt
12 Operation payback
13 Pakistan will win today
14 Hacking is fun
6 Network Security
7 Tiger lives in jungle
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

7. Task

What would be the result of the following commands.

- cat filename > new // filename is name of file that exist at current path
- date > new
- ls | sort -r
- ls | sort -r >> new

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~
```

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ cat file2.txt > new
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ date > new
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ ls | sort -r
student.txt
students
snap
RIPHAH
pstudent.txt
Pictures
new
Music
labsorted06
lab06
lab05
hello.java
fstudent.txt
first
file2.txt
05
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```