

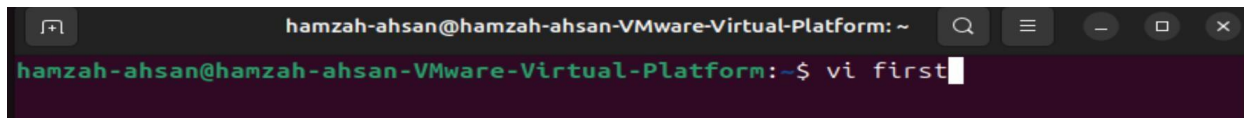
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Course: OS

Lab Task 06

Command: vi first


A screenshot of a terminal window with a dark background. The title bar at the top shows the user 'hamzah-ahsan' and the host 'hamzah-ahsan-VMware-Virtual-Platform'. The terminal text shows the prompt 'hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~\$' followed by the command 'vi first' and a cursor. The window has standard Linux window controls (minimize, maximize, close) on the right side.

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform: ~  
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ vi first
```

Creating first file .

[illegible]

Output is coming on top “Knowledge is power”.

A terminal window with a dark background. The title bar shows the user 'hamzah-ahsan' and the host 'hamzah-ahsan-VMware-Virtual-Platform'. The prompt is 'hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform: ~'. The output of the command is 'Knowledge is Power'.

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: ~
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ echo -e "\033[31m Heloo World"
Heloo 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: ~
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 (tty2)
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. echo
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

```
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform: ~/lab06
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ mkdir lab06
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ cd lab06
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ uname -n
hamzah-ahsan-VMware-Virtual-Platform
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ uname -r
6.14.0-27-generic
hamzah-ahsan@hamzah-ahsan-VMware-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-VMware-Virtual-Platform:~/lab06$ uname -m
x86_64
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ uname -p
x86_64
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ uname -t
uname: invalid option -- 't'
Try 'uname --help' for more information.
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ uname -o
GNU/Linux
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ 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:~/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
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ touch labsort06
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ cat>labsort06
End of file
6 apples
File to be sorted
apple one the table
20 year old
File to be sorted
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$ sort labsort06
20 year old
6 apples
apple one the table
End of file
File to be sorted
File to be sorted
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~/lab06$
```

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
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

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;
}
^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: ~  
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 Worlds"  
Hello Worlds  
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:~$ echo -e "\033[0m 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: ~  
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ ls /lib/modules  
4.14.0-27-generic  
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$ uname -r  
4.14.0-27-generic  
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$  
hamzah-ahsan@hamzah-ahsan-VMware-Virtual-Platform:~$
```

4. Task

Run all above switches with uname command.

```

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

```
GNU nano 7.2 file2.txt *  
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: ~  
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: ~  
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:~$
```