

**EmbedUR Systems Privated Limited**

Linux program Training

Module - 2

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## Environmental Variable

1)How can you know what is the secondary command prompt set your system ?

How can you change the secondary command prompt from the default to your username ?

**Command :** echo \$PS2

**Command :** export PS2="\u> "

### Output :

The screenshot shows a Kali Linux terminal window titled "buvanesh@kali:". The user enters `sudo nano ~/.bashrc` and sets the password. Then, they enter `source ~/.bashrc`. The terminal shows several failed attempts to run `'shopt'` and `'shout'`, indicating they are not installed. Finally, the user runs `export PS1="\u >"`, which changes the prompt from `buvanesh@kali:~$` to `\u >`.

How can you ensure that the mv command (used for renaming a file) always asks for permission before overwriting an existing destination file ?

[ Hint : use alias command ]

**Command :** alias mv='mv -i'

**Command :** source ~/.bashrc

### Output:

The screenshot shows a Kali Linux terminal window with the title 'buvanesh@kali: ~'. The terminal is running the GNU nano 7.2 text editor, editing the file '/home/buvanesh/.bashrc'. The file content is as follows:

```

if [ -f ~/.bash_aliases ]; then
  . ~/.bash_aliases
fi

# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi

export JAVA_HOME=/usr/lib/jvm/java-17.0.6-openjdk-amd64
export PATH=$PATH:/usr/lib/jvm/java-17.0.6-openjdk-amd64/bin
export HADOOP_HOME=~/.hadoop-3.3.6/
export PATH=$PATH:$HADOOP_HOME/bin
export PATH=$PATH:$HADOOP_HOME/sbin
export HADOOP_MAPRED_HOME=$HADOOP_HOME
export YARN_HOME=$HADOOP_HOME
export HADOOP_CONF_DIR=$HADOOP_HOME/etc/hadoop
export HADOOP_COMMON_LIB_NATIVE_DIR=$HADOOP_HOME/lib/native
export HADOOP_OPTS="-Djava.library.path=$HADOOP_HOME/lib/native"
export HADOOP_STREAMING=$HADOOP_HOME/share/hadoop/tools/lib/hadoop-streaming-3.2.3.jar
export HADOOP_LOG_DIR=$HADOOP_HOME/logs
export PDSH_RCMD_TYPE=ssh

PS1="MyTestPrompt> "
alias mv='mv -i'

```

At the bottom of the terminal, there is a row of keyboard shortcuts for nano editor:

- ^G Help
- ^O Write Out
- ^W Where Is
- ^K Cut
- ^J Execute
- ^L Location
- M-U Undo
- M-A Set Mark
- M-] To Bracket
- ^X Exit
- ^R Read File
- ^A Replace
- ^P Paste
- ^\_ Justify
- ^G Go To Line
- M-E Redo
- M-G Copy
- ^C Where Was



Type df and du commands and see the output on your terminal.

## Output:

```
(buvanes@kali) ~  
$ df  
Filesystem      1K-blocks    Used Available Use% Mounted on  
udev            3942524         0   3942524    0% /dev  
tmpfs           796412      1784    794628    1% /run  
/dev/nvme0n1p10 50304536 19409588 28307148  41% /  
tmpfs           3982044     34016   3948028    1% /dev/shm  
tmpfs           5120         0       5120    0% /run/lock  
/dev/nvme0n1p1  262144     30452    231692   12% /boot/efi  
tmpfs           796408        76    796332    1% /run/user/1000  
  
(buvanes@kali) ~  
$ du  
4 ./Public  
4  ./config/Code/blob_storage/fd749a5a-9091-4348-a8c9-c4ecf1d5805c  
8  ./config/Code/blob_storage  
32 ./config/Code/databases  
8  ./config/Code/logs/20230920T165933/window1/exthost/vscode.github-authentication  
8  ./config/Code/logs/20230920T165933/window1/exthost/vscode.github  
8  ./config/Code/logs/20230920T165933/window1/exthost/vscode.microsoft-authentication  
36 ./config/Code/logs/20230920T165933/window1/exthost  
4  ./config/Code/logs/20230920T165933/window1/output_20230920T165936  
52 ./config/Code/logs/20230920T165933/window1  
76 ./config/Code/logs/20230920T165933  
8  ./config/Code/logs/20230920T220224/window1/exthost/vscode.github-authentication  
8  ./config/Code/logs/20230920T220224/window1/exthost/vscode.github  
4  ./config/Code/logs/20230920T220224/window1/exthost/output_logging_20230920T220326  
8  ./config/Code/logs/20230920T220224/window1/exthost/vscode.git  
8  ./config/Code/logs/20230920T220224/window1/exthost/vscode.microsoft-authentication  
56 ./config/Code/logs/20230920T220224/window1/exthost  
4  ./config/Code/logs/20230920T220224/window1/output_20230920T220226  
4  ./config/Code/logs/20230920T220224/window1/output_20230920T220325  
76 ./config/Code/logs/20230920T220224/window1  
100 ./config/Code/logs/20230920T220224  
8  ./config/Code/logs/20230920T205509/window1/exthost/vscode.github-authentication  
8  ./config/Code/logs/20230920T205509/window1/exthost/vscode.github
```

5)Type this command on the terminal and see the output :

```
du -ch *.txt
```

## output:

```
(buvanes@kali) ~/sample  
$ du -ch *.txt  
du: cannot access '*.txt': No such file or directory  
0      total  
  
(buvanes@kali) ~/sample  
$ ls  
a.out demo1.c demo2.c demo3.c demo4.c demo5.c  
  
(buvanes@kali) ~/sample  
$ du -ch *.c  
4.0K demo1.c  
4.0K demo2.c  
4.0K demo3.c  
4.0K demo4.c  
4.0K demo5.c  
20K total  
  
(buvanes@kali) ~/sample  
$
```

6) Delete the user account "Duck" permanently along with its home folder.

**Command :** `sudo userdel -r Duck`

**Description :**

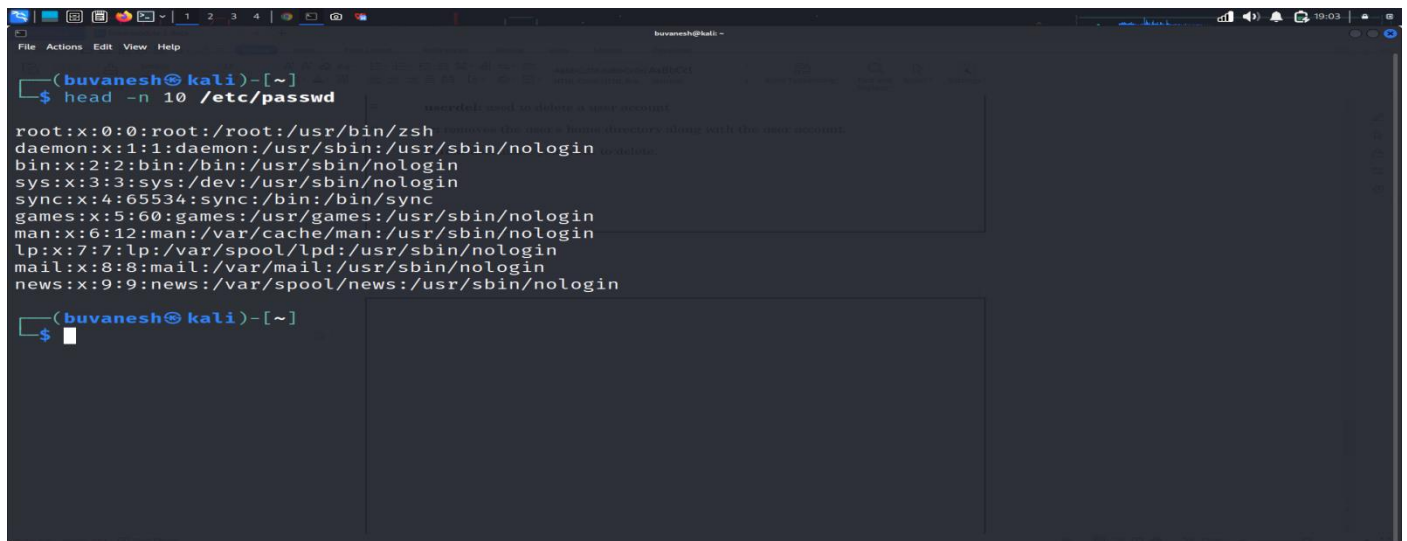
- ✧ **sudo:** used to execute the following command with superuser (root) privileges.
- ✧ **userdel:** used to delete a user account.
- ✧ **-r:** removes the user's home directory along with the user account.
- ✧ **Duck:** username you want to delete.

## Simple Filters

**Head:**

Try to get the first 10 lines from `/etc/passwd`

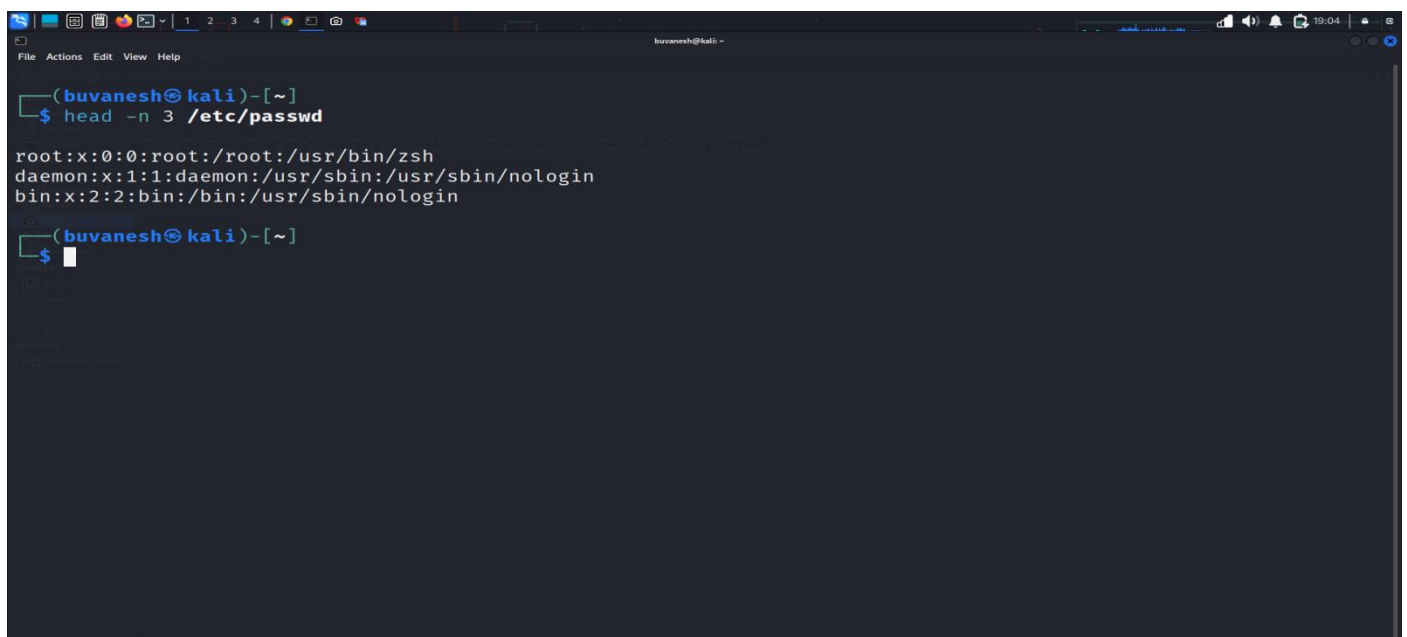
**Output:**



```
(buvanes@kali)~$ head -n 10 /etc/passwd
root:x:0:0:root:/root:/usr/bin/zsh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
(buvanes@kali)~$
```

Try to get just the first 3 lines from `/etc/passwd`

**Output:**

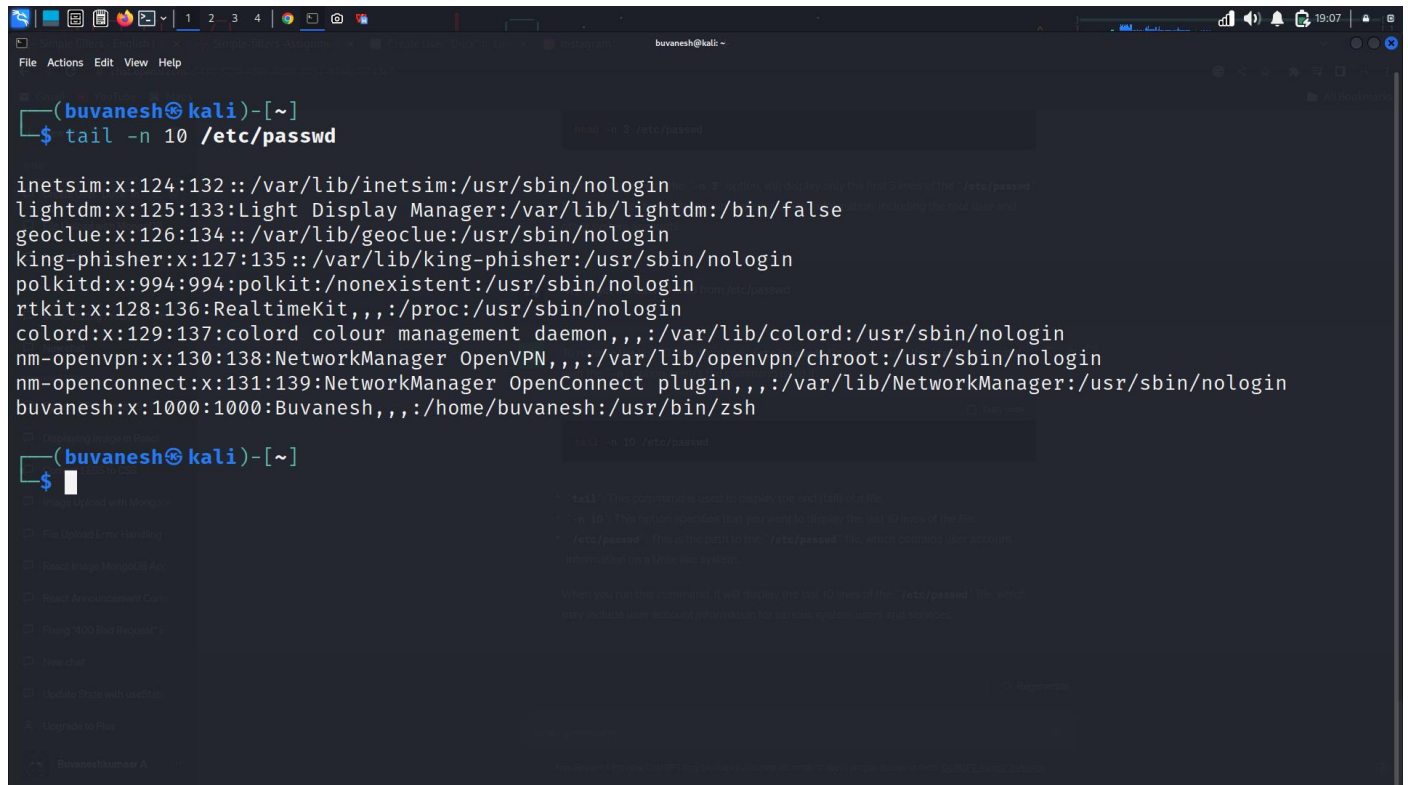


```
(buvanes@kali)~$ head -n 3 /etc/passwd
root:x:0:0:root:/root:/usr/bin/zsh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
(buvanes@kali)~$
```

## Tail

Type `tail -n 10 /etc/passwd`

**Output:**



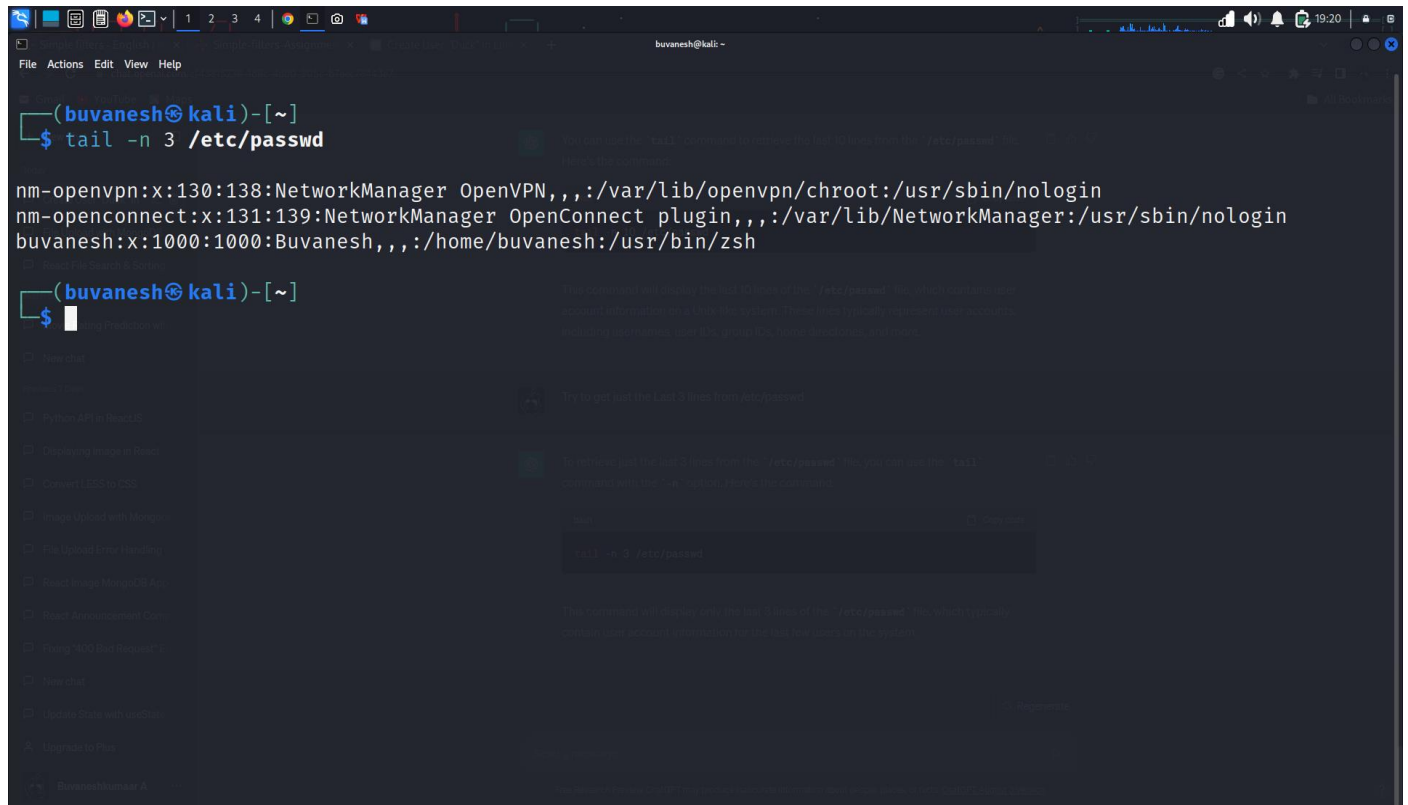
```
(buvanesh@kali)-[~]
$ tail -n 10 /etc/passwd

inetsim:x:124:132::/var/lib/inetsim:/usr/sbin/nologin
lightdm:x:125:133:Light Display Manager:/var/lib/lightdm:/bin/false
geoclue:x:126:134::/var/lib/geoclue:/usr/sbin/nologin
king-phisher:x:127:135::/var/lib/king-phisher:/usr/sbin/nologin
polkitd:x:994:994:polkit:/nonexistent:/usr/sbin/nologin
rtkit:x:128:136:RealtimeKit,,,:/proc:/usr/sbin/nologin
colord:x:129:137:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
nm-openvpn:x:130:138:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
nm-openconnect:x:131:139:NetworkManager OpenConnect plugin,,,:/var/lib/NetworkManager:/usr/sbin/nologin
buvanesh:x:1000:1000:Buvanesh,,,:/home/buvanesh:/usr/bin/zsh

(buvanesh@kali)-[~]
$
```

Type `tail -n 3 /etc/passwd`

**Output:**



```
(buvanesh@kali)-[~]
$ tail -n 3 /etc/passwd

nm-openvpn:x:130:138:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
nm-openconnect:x:131:139:NetworkManager OpenConnect plugin,,,:/var/lib/NetworkManager:/usr/sbin/nologin
buvanesh:x:1000:1000:Buvanesh,,,:/home/buvanesh:/usr/bin/zsh

(buvanesh@kali)-[~]
$
```



## Sort

Try to sort the file `/etc/passwd` in assending order.

### Output:

```
(buvanesesh@kali)-[~]
$ sudo sort -t : -k 1,1 /etc/passwd

[sudo] password for buvanesh:
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
buvanesesh:x:1000:1000:Buvanesesh,,,:/home/buvanesesh:/usr/bin/zsh
colord:x:129:137:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
Debian-snm:x:117:123::/var/lib/snm:/bin/false
dnsmasq:x:114:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
games:x:5:60:games:/usr/games:/usr/sbin/nologin
geoclue:x:126:134::/var/lib/geoclue:/usr/sbin/nologin
_gvm:x:118:124::/var/lib/opensvas:/usr/sbin/nologin
inetsim:x:124:132::/var/lib/inetsim:/usr/sbin/nologin
iodine:x:105:65534::/run/iodine:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
king-phisher:x:127:135::/var/lib/king-phisher:/usr/sbin/nologin
lightdm:x:125:133:Light Display Manager:/var/lib/lightdm:/bin/false
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
messagebus:x:106:111::/nonexistent:/usr/sbin/nologin
miredo:x:107:65534::/var/run/miredo:/usr/sbin/nologin
```

Try to sort the file `/etc/passwd` in desending order.

### Output:

```
(buvanesesh@kali)-[~]
$ sudo sort -t : -k 1,1r /etc/passwd

www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
usbmux:x:109:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
tss:x:101:108:TPM software stack,,,:/var/lib/tpm:/bin/false
tcpdump:x:111:119::/nonexistent:/usr/sbin/nologin
systemd-timesync:x:997:997:systemd Time Synchronization:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
stunnel4:x:996:996:stunnel service system account:/var/run/stunnel4:/usr/sbin/nologin
strongswan:x:102:65534::/var/lib/strongswan:/usr/sbin/nologin
statd:x:115:65534::/var/lib/nfs:/usr/sbin/nologin
sslh:x:120:125::/nonexistent:/usr/sbin/nologin
sshd:x:112:65534::/run/sshd:/usr/sbin/nologin
speech-dispatcher:x:119:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
saned:x:123:131::/var/lib/saned:/usr/sbin/nologin
rwhod:x:104:65534::/var/spool/rwho:/usr/sbin/nologin
rtkit:x:128:136:RealtimeKit,,,:/proc:/usr/sbin/nologin
_rpc:x:113:65534::/run/rpcbind:/usr/sbin/nologin
root:x:0:0:root:/root:/usr/bin/zsh
redsocks:x:103:109::/var/run/redsocks:/usr/sbin/nologin
redis:x:108:115::/var/lib/redis:/usr/sbin/nologin
pulse:x:122:128:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
```

Try to sort the file /etc/passwd in assending order based on the 3rd column

### Output:

```
(buvaneshtkali)-[~]
$ sudo sort -t : -k 3,3n /etc/passwd

root:x:0:0:root:/root:/usr/bin/zsh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailng List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
mysql:x:100:107:MySQL Server,,,:/nonexistent:/bin/false
tss:x:101:108:TPM software stack,,,:/var/lib/tpm:/bin/false
strongswan:x:102:65534::/var/lib/strongswan:/usr/sbin/nologin
redsocks:x:103:109::/var/run/redsocks:/usr/sbin/nologin
rwhod:x:104:65534::/var/spool/rwho:/usr/sbin/nologin
iodine:x:105:65534::/run/iodine:/usr/sbin/nologin
messagebus:x:106:111::/nonexistent:/usr/sbin/nologin
```

### Cut

Try to cut just the usernames from the file /etc/passwd

### Output:

```
(buvaneshtkali)-[~]
$ sudo cut -d : -f 1 /etc/passwd

root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
_apt
nobody
systemd-network
mysql
tss
strongswan
systemd-timesync
redsocks
rwhod
iodine
```



## Paste:

Create a file alphabets.txt and key in all the 26 alphabets each one in a new line

## Output:

```
(buvanes@kali)~$ echo -e "a\nb\nc\nd\ne\nf\ng\nh\ni\nj\nk\nl\nm\nn\no\np\nq\nr\ns\nt\nu\nv\nw\nx\ny\nz" > alphabets.txt

(buvanes@kali)~$ ls
alphabets.txt  demo  demodir  Desktop  Documents  Downloads  Music  Pictures  Public  sample  Videos

(buvanes@kali)~$ cat alphabets.txt
a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
```

Create a file number.txt and key in 1 to 26 each one in a new line.

## Output:

```
(buvanes@kali)~$ seq 1 26 > number.txt

(buvanes@kali)~$ ls
alphabets.txt  demo  demodir  Desktop  Documents  Downloads  Music  number.txt  Pictures  Public  sample  Videos

(buvanes@kali)~$ cat number.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
```

Try to paste those two files, to see which letter appears at what number.

Paste alphabets.txt numbers.txt

**Output:**

```
(buvanesh@kali)-[~]
$ paste alphabets.txt numbers.txt

a 1
b 2
c 3
d 4
e 5
f 6
g 7
h 8
i 9
j 10
k 11
l 12
m 13
n 14
o 15
p 16
q 17
r 18
s 19
t 20
u 21
v 22
w 23
x 24
y 25
z 26
```

## Grep Commands

1) Explore some other commands like -E, + and ?

**Output:**

```
(buvanesh@kali)-[~]
$ echo "apple" | grep -E "app(le)?"
apple

(buvanesh@kali)-[~]
$ echo "abbbbbc" | grep -E "b+"
abbbbbc

(buvanesh@kali)-[~]
$ echo "color" | grep -E "colo?r"
color

(buvanesh@kali)-[~]
$
```

## Grep Commands

1) List those entries that are 5 letters long and starts with Y

**Command :** `grep -E '^Y.{4}$' entries.txt`

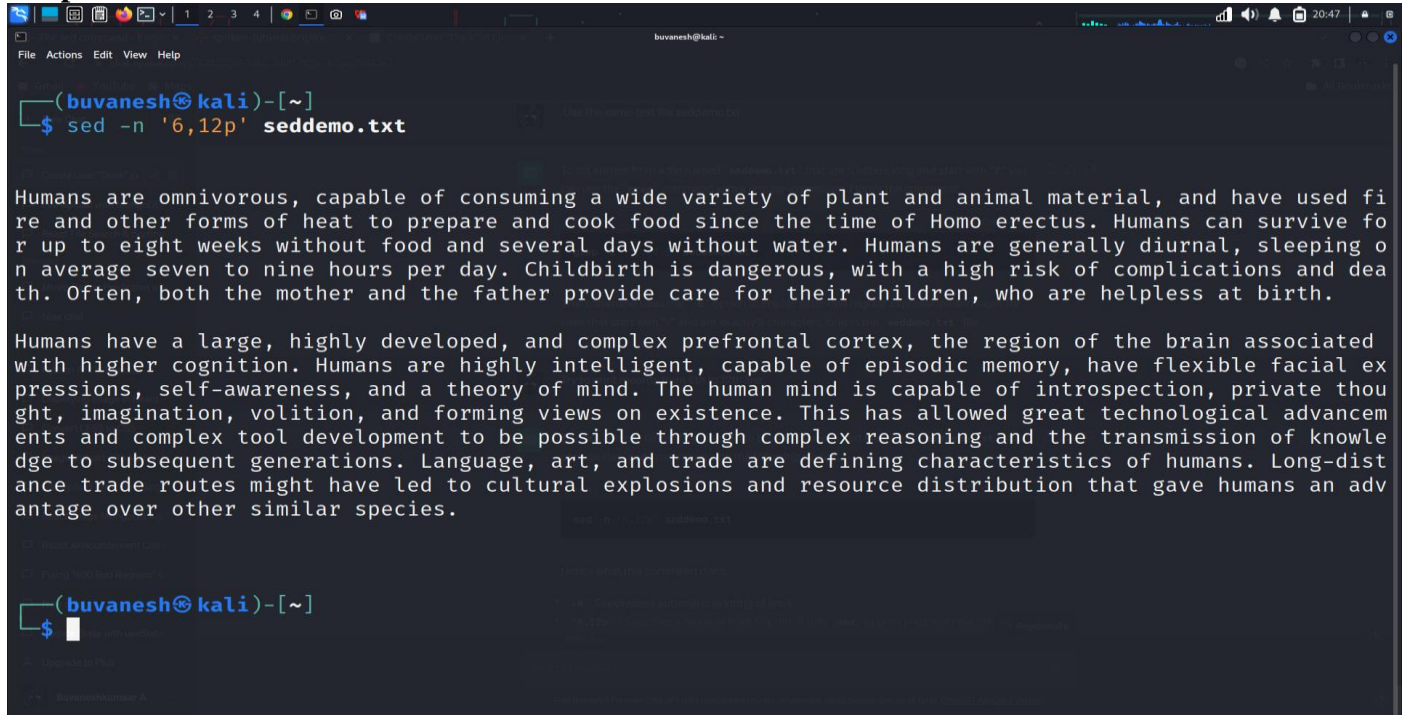
## Sed Commands

Use the same text file seddemo.txt

**Command :** `grep -E '^Y.{4}$' seddemo.txt`

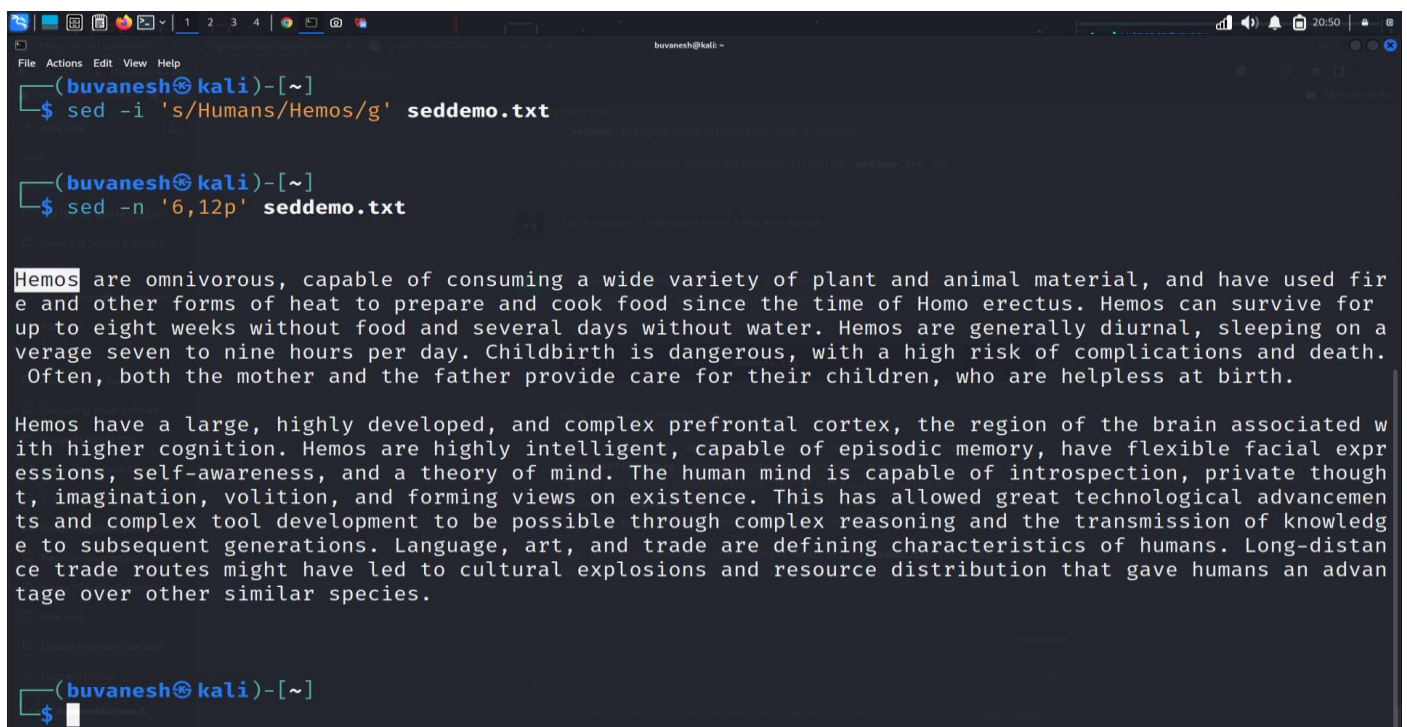
Try to print records from 6th to 12th line.

**Output:**



```
(buvanes@kali)-[~]  
$ sed -n '6,12p' seddemo.txt  
  
Humans are omnivorous, capable of consuming a wide variety of plant and animal material, and have used fire and other forms of heat to prepare and cook food since the time of Homo erectus. Humans can survive for up to eight weeks without food and several days without water. Humans are generally diurnal, sleeping on average seven to nine hours per day. Childbirth is dangerous, with a high risk of complications and death. Often, both the mother and the father provide care for their children, who are helpless at birth.  
  
Humans have a large, highly developed, and complex prefrontal cortex, the region of the brain associated with higher cognition. Humans are highly intelligent, capable of episodic memory, have flexible facial expressions, self-awareness, and a theory of mind. The human mind is capable of introspection, private thought, imagination, volition, and forming views on existence. This has allowed great technological advancements and complex tool development to be possible through complex reasoning and the transmission of knowledge to subsequent generations. Language, art, and trade are defining characteristics of humans. Long-distance trade routes might have led to cultural explosions and resource distribution that gave humans an advantage over other similar species.  
  
(buvanes@kali)-[~]  
$
```

Try to replace or substitute name Humans with Hemos



```
(buvanes@kali)-[~]  
$ sed -i 's/Humans/Hemos/g' seddemo.txt  
  
(buvanes@kali)-[~]  
$ sed -n '6,12p' seddemo.txt  
  
Hemos are omnivorous, capable of consuming a wide variety of plant and animal material, and have used fire and other forms of heat to prepare and cook food since the time of Homo erectus. Hemos can survive for up to eight weeks without food and several days without water. Hemos are generally diurnal, sleeping on average seven to nine hours per day. Childbirth is dangerous, with a high risk of complications and death. Often, both the mother and the father provide care for their children, who are helpless at birth.  
  
Hemos have a large, highly developed, and complex prefrontal cortex, the region of the brain associated with higher cognition. Hemos are highly intelligent, capable of episodic memory, have flexible facial expressions, self-awareness, and a theory of mind. The human mind is capable of introspection, private thought, imagination, volition, and forming views on existence. This has allowed great technological advancements and complex tool development to be possible through complex reasoning and the transmission of knowledge to subsequent generations. Language, art, and trade are defining characteristics of humans. Long-distance trade routes might have led to cultural explosions and resource distribution that gave humans an advantage over other similar species.  
  
(buvanes@kali)-[~]  
$
```