

1. What is the size of MBR and what does it contain?  
=> Size of MBR is 512 bytes and it contains boot loader (446 bytes), partition table (64 bytes) and magic number (2 bytes).
2. In which file you can write commands which you want to run whenever Linux system starts/restarts?  
=> We can write commands in rc.local file in /etc to run whenever Linux system starts/restarts.
3. Reboot the system using runlevel.  
=> `$init 6`
4. Restart cron service.  
=> `$ service cron restart`
5. Create an ext4 filesystem  
=> `$mkfs -t ext4 /dev/xvda`
6. Mount the created filesystem on /partition directory.  
=> `$ mkdir /partition`  
`$ mount /dev/xvda /partition`
7. Difference between LVM and RAID.  
=> A RAID device is a physical grouping of disk devices in order to create a logical presentation of one device to an Operating System for redundancy or performance or a combination of the two whereas, LVM is a logical layer that can be manipulated in order to create and, or expand a logical presentation of a disk device to an Operating System.
8. Create a LVM(Slide 13)  
=> -Select the Physical Storage Devices for LVM  
`$pvcreate /dev/sda1 /dev/sda2`  
-Create the Volume Group  
`$vgcreate vol_grp1 /dev/sda1 /dev/sda2`  
-Create Logical Volumes  
`$lvcreate -l 20 -n logical_vol1 vol_grp1`
9. Create a RAID1 device(Slide 19)
10. Create a swapfile of 500Mb(slide20)
11. Set setuid and setgid on two different files.
12. What is the use of Sticky bit?  
=> A Sticky bit is a permission bit that is set on a file or a directory that lets only the owner of the file/directory or the root user to delete or rename the file.

13. Create a user and add it to one secondary group.

```
File Edit View Search Terminal Help
abhishek@abhishek:~$ sudo adduser test
[sudo] password for abhishek:
Adding user `test' ...
Adding new group `test' (1001) ...
Adding new user `test' (1001) with group `test' ...
Creating home directory `/home/test' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for test
Enter the new value, or press ENTER for the default
    Full Name []: test
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] y
abhishek@abhishek:~$ sudo usermod -G abhishek test
abhishek@abhishek:~$ id test
uid=1001(test) gid=1001(test) groups=1001(test),1000(abhishek)
abhishek@abhishek:~$
```

14. Lock this user.

```

File Edit View Search Terminal Help
abhishek@abhishek:~$ sudo passwd -l test
passwd: password expiry information changed.
abhishek@abhishek:~$ su test
Password:
su: Authentication failure
abhishek@abhishek:~$ █

```

15. Give this user full access (without password).

```

Activities Terminal Tue Feb 11, 4:48:54 PM 10.6KB/s 298B/s
abhishek@abhishek: ~
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/sudoers.tmp Modified

#
# This file MUST be edited with the 'visudo' command as root.
#
# Please consider adding local content in /etc/sudoers.d/ instead of
# directly modifying this file.
#
# See the man page for details on how to write a sudoers file.
#
Defaults env_reset
Defaults mail_badpass
Defaults secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin"

# Host alias specification

# User alias specification

# Cmnd alias specification

# User privilege specification
root    ALL=(ALL:ALL) ALL
test    ALL=(ALL) NOPASSWD:ALL

# Members of the admin group may gain root privileges
%admin   ALL=(ALL) ALL

^G Get Help  ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos    M-U Undo      M-A Mark Text
^X Exit      ^R Read File  ^\ Replace    ^U Uncut Text ^T To Spell   ^_ Go To Line  M-E Redo      M-G Copy Text

```

```
File Edit View Search Terminal Help
abhishek@abhishek:~$ su test
Password:
test@abhishek:/home/abhishek$ sudo apt install gcc
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  fprintd libfprint0 python3-psutil python3-setproctitle python3-xapp
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  gcc-7 libasan4 libatomic1 libc-dev-bin libc6-dev libcilkrts5 libgcc-7-dev libitm1 liblsan0 libmpx2 libquadmath0 libtsan0 libubsan0
  linux-libc-dev manpages-dev
Suggested packages:
  gcc-multilib make autoconf automake libtool flex bison gcc-doc gcc-7-multilib gcc-7-doc gcc-7-locales libgcc1-dbg libgomp1-dbg
  libitm1-dbg libatomic1-dbg libasan4-dbg liblsan0-dbg libtsan0-dbg libubsan0-dbg libcilkrts5-dbg libmpx2-dbg libquadmath0-dbg
  glibc-doc
The following NEW packages will be installed:
  gcc gcc-7 libasan4 libatomic1 libc-dev-bin libc6-dev libcilkrts5 libgcc-7-dev libitm1 liblsan0 libmpx2 libquadmath0 libtsan0
  libubsan0 linux-libc-dev manpages-dev
0 upgraded, 16 newly installed, 0 to remove and 34 not upgraded.
Need to get 16.9 MB of archives.
After this operation, 73.6 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

16. Delete the create user after taking backup of it home directory.

```

File Edit View Search Terminal Help
abhishek@abhishek:~$ ls /home/test/
examples.desktop
abhishek@abhishek:~$ sudo deluser --remove-home --backup-to /tmp/ test
Looking for files to backup/remove ...
Backing up files to be removed to /tmp/ ...
backup_name = /tmp//test.tar
/bin/tar: Removing leading '/' from member names
Removing files ...
Removing user `test' ...
Warning: group `test' has no more members.
Done.
abhishek@abhishek:~$ ls /tmp/
config-err-nLuqQj
lu3335hru4y9.tmp
OSL_PIPE_1000_SingleOfficeIPC_623fd421166ef467e2ce559a134ea98
ssh-b4tGrssn6Ina
systemd-private-911cb1db55004f6da57cb66bf4fbac11-bolt.service-ABkbwi
systemd-private-911cb1db55004f6da57cb66bf4fbac11-colord.service-yKCI2E
systemd-private-911cb1db55004f6da57cb66bf4fbac11-fwupd.service-HMH02N
systemd-private-911cb1db55004f6da57cb66bf4fbac11-ModemManager.service-7zA8rS
systemd-private-911cb1db55004f6da57cb66bf4fbac11-rtkit-daemon.service-Su3N8Z
systemd-private-911cb1db55004f6da57cb66bf4fbac11-systemd-resolved.service-RkWmAX
systemd-private-911cb1db55004f6da57cb66bf4fbac11-systemd-timesyncd.service-nVHleo
test.tar.bz2
abhishek@abhishek:~$ █

```

17. Create a file with some content. Change all lower case letters to upper case letters and save output to another file using redirections.

```

File Edit View Search Terminal Help
abhishek@abhishek:~$ cat > input.txt
convert this to upper case
abhishek@abhishek:~$ tr '[:lower:]' '[:upper:]' < input.txt > output.txt
abhishek@abhishek:~$ cat output.txt
CONVERT THIS TO UPPER CASE
abhishek@abhishek:~$ █

```



18. Set nice value of a process to -1.

```
File Edit View Search Terminal Help
abhishek@abhishek:~$ ps -eo "%p %n %c %U" | sort -k 1 -nr
9360  0 sort          abhishek
9359  0 ps             abhishek
9354  0 kworker/4:2      root
9329  0 kworker/6:0      root
9328  0 kworker/3:0      root
9327  0 kworker/1:1      root
9308  -1 kworker/0:1      root
9306  0 kworker/5:2      root
9303  0 kworker/2:0      root
9289  0 kworker/7:0      root
9287  0 kworker/u16:0    root
9269  0 kworker/4:0      root
9208  0 pager            abhishek
9198  0 man              abhishek
```

```
File Edit View Search Terminal Help
abhishek@abhishek:~$ sudo renice -1 9354
9354 (process ID) old priority 0, new priority -1
abhishek@abhishek:~$ ps -eo "%p %n %c %U" | sort -k 1 -nr
9402  0 sort          abhishek
9401  0 ps             abhishek
9354  -1 kworker/4:2      root
9329  0 kworker/6:0      root
9328  0 kworker/3:0      root
9327  0 kworker/1:1      root
9308  -1 kworker/0:1      root
9306  0 kworker/5:2      root
9303  0 kworker/2:0      root
9289  0 kworker/7:0      root
9287  0 kworker/u16:0    root
9269  0 kworker/4:0      root
9208  0 pager            abhishek
9198  0 man              abhishek
9153  0 kworker/1:2      root
9148  0 kworker/5:1      root
9115  0 kworker/7:2      root
9113  0 kworker/3:1      root
9112  0 kworker/u16:1    root
9054  0 kworker/0:0      root
9048  0 kworker/2:2      root
9029  0 bash             abhishek
9016  0 kworker/6:1      root
```

19. Get a list of all files used by "telnet".

```
File Edit View Search Terminal Help
abhishek@abhishek:~$ dpkg-query --listfiles telnet
/.
/usr
/usr/bin
/usr/bin/telnet.netkit
/usr/share
/usr/share/doc
/usr/share/doc/telnet
/usr/share/doc/telnet/BUGS
/usr/share/doc/telnet/README.gz
/usr/share/doc/telnet/README.telnet
/usr/share/doc/telnet/README.telnet.old.gz
/usr/share/doc/telnet/changelog.Debian.gz
/usr/share/doc/telnet/copyright
/usr/share/lintian
/usr/share/lintian/overrides
/usr/share/lintian/overrides/telnet
/usr/share/man
/usr/share/man/man1
/usr/share/man/man1/telnet.netkit.1.gz
/usr/share/menu
/usr/share/menu/telnet
abhishek@abhishek:~$ █
```

20. Check if port 22 is listening using netstat and telnet command.

```
File Edit View Search Terminal Help
abhishek@abhishek:~$ telnet localhost 22
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
SSH-2.0-OpenSSH_7.6p1 Ubuntu-4ubuntu0.3
^]
telnet> █
```

```

File Edit View Search Terminal Help
abhishek@abhishek:~$ netstat -lnpt
(Not all processes could be identified, non-owned process info
 will not be shown, you would have to be root to see it all.)
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 127.0.0.1:3306          0.0.0.0:*               LISTEN      -
tcp        0      0 127.0.0.53:53          0.0.0.0:*               LISTEN      -
tcp        0      0 0.0.0.0:22             0.0.0.0:*               LISTEN      -
tcp        0      0 127.0.0.1:631          0.0.0.0:*               LISTEN      -
tcp6       0      0 :::22                  :::*                    LISTEN      -
tcp6       0      0 :::1:631                :::*                    LISTEN      -
abhishek@abhishek:~$

```

21. Create a cron job which runs once a week at 23:45.

=> `$crontab -e`

`45 23 * * 1`

22. Difference between dig and traceroute

=> Traceroute gives hop count.

```

File Edit View Search Terminal Help
abhishek@abhishek:~$ traceroute google.com
traceroute to google.com (172.217.166.46), 30 hops max, 60 byte packets
 1  _gateway (192.168.1.254)  1.261 ms  1.444 ms  1.981 ms
 2  10.153.128.1 (10.153.128.1)  28.552 ms  29.060 ms  29.068 ms
 3  45.127.44.242 (45.127.44.242)  30.630 ms  30.206 ms  30.628 ms
 4  108.170.248.193 (108.170.248.193)  30.821 ms  32.145 ms  32.209 ms
 5  108.170.235.51 (108.170.235.51)  32.923 ms  108.170.234.209 (108.170.234.209)  34.267 ms  108.170.235.51 (108.170.235.51)  34.469 ms
 6  bom07s18-in-f14.1e100.net (172.217.166.46)  33.656 ms  27.820 ms  27.338 ms
abhishek@abhishek:~$

```

Dig shows ip address corresponding to domain name.

```

File Edit View Search Terminal Help
abhishek@abhishek:~$ dig google.com

; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> google.com
;; global options: +cmd
;; Got answer:
;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 48301
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags::; udp: 65494
;; QUESTION SECTION:
;google.com.                IN      A

;; ANSWER SECTION:
google.com.                 139     IN      A      172.217.166.46

;; Query time: 0 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Wed Feb 12 00:10:41 IST 2020
;; MSG SIZE rcvd: 55

abhishek@abhishek:~$

```