1. Create a directory "exercise" inside your home directory and create nested(dir1/dir2/dir3) directory structure inside "excerise" with single command.

```
ttn@sarthak-sharma:~$ cd /home
ttn@sarthak-sharma:/home$ sudo mkdir -p exercise/dir1/dir2/dir3
ttn@sarthak-sharma:/home$ cd  exercise/dir1/dir2/dir3
ttn@sarthak-sharma:/home/exercise/dir1/dir2/dir3$
```

2. Create two empty files inside dir2 directory: emptyFile1,emptyFile2 in single command

```
ttn@sarthak-sharma:/home/exercise/dir1/dir2$ sudo touch emptyfile{1..2}.txt
ttn@sarthak-sharma:/home/exercise/dir1/dir2$ ls
dir3  emptyfile1.txt  emptyfile2.txt
ttn@sarthak-sharma:/home/exercise/dir1/dir2$
```

3. Create one file file1.txt containing text "hello world" and save it

```
ttn@sarthak-sharma:/tmp$ sudo echo "Hello World" > file1.txt
ttn@sarthak-sharma:/tmp$ ls
config-err-rz60EY
file1.txt
```

```
ttn@sarthak-sharma:/$ sudo find /etc -name passwd
/etc/cron.daily/passwd
/etc/passwd
/etc/pam.d/passwd
ttn@sarthak-sharma:/$ sudo cp /etc/passwd /etc/passwd_copy
ttn@sarthak-sharma:/$ sudo mv /etc/passwd_copy /etc/passwd_backup
ttn@sarthak-sharma:/$
```

.

4. Find a "passwd" file using find command inside /etc. copy this files as passwd_copy and the rename this file as passwd_backup.

```
ttn@sarthak-sharma:/$ sudo find /etc -name passwd
/etc/cron.daily/passwd
/etc/passwd
/etc/pam.d/passwd
ttn@sarthak-sharma:/$ sudo cp /etc/passwd /etc/passwd_copy
ttn@sarthak-sharma:/$ sudo mv /etc/passwd_copy /etc/passwd_backup
ttn@sarthak-sharma:/$
```

5. Try reading passwd_backup file in multiple tools: less,more,cat,strings etc and find the difference in their usage.

```
ttn@sarthak-sharma:/etc$ cat passwd_backup
root:x:0:0:root:/root:/bin/bash
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:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
```

```
ttn@sarthak-sharma:/etc$ strings passwd_backup
root:x:0:0:root:/root:/bin/bash
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
```

```
ttn@sarthak-sharma:/etc$ less passwd_backup
ttn@sarthak-sharma:/etc$
ttn@sarthak-sharma:/etc$ more passwd_backup
root:x:0:0:root:/root:/bin/bash
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
```

6. Find out the number of line in password_backup containing "/bin/false".

```
ttn@sarthak-sharma:/etc$ wc -l passwd_backup
41 passwd_backup
```

7. Get the first 5 lines of a file “password_backup” and Redirect the output of the above commands into file "output".

```
root@sarthak-sharma:~# cd /etc
root@sarthak-sharma:/etc# sudo head -n 5 passwd_backup > output.txt
root@sarthak-sharma:/etc#
```

8. Create a "test" user,create its password and find out its uid and gid.

```
ttn@sarthak-sharma:/home/exercise/dir1/dir2$ sudo adduser test
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 []:
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n]
ttn@sarthak-sharma:/home/exercise/dir1/dir2$ id -u test
1001
ttn@sarthak-sharma:/home/exercise/dir1/dir2$ id -g test
1001
ttn@sarthak-sharma:/home/exercise/dir1/dir2$
```

9. Change the timestamp of emptyFile1,emptyFile2 which are exist in dir2

```
ttn@sarthak-sharma:~$ cd /home
ttn@sarthak-sharma:/home$ cd exercise/dir1/dir2
ttn@sarthak-sharma:/home/exercise/dir1/dir2$ sudo touch emptyfile{1..2}.txt
ttn@sarthak-sharma:/home/exercise/dir1/dir2$
```

10. Login as test user and edit the "output" file created above. Since the permission wont allow you to save the changes. Configure such that test user can edit it.
    1. Add group owner of the "output" file as the secondary group of testuser and check/change the "output" file permission if it is editable by group. Once done revert the changes
    2. Make the file editable to the world so that test user can access it. Revert the changes after verification
    3. Change the ownership to edit the file.

```
welcome
test@sarthak-sharma:/etc$ sudo chmod 600 output.txt
test@sarthak-sharma:/etc$ vi output.txt
test@sarthak-sharma:/etc$ sudo chmod 666 output.txt
test@sarthak-sharma:/etc$ vi output.txt
test@sarthak-sharma:/etc$
```

11. Create alias with your name so that it creates a file as "/tmp/aliastesting".

```
ttn@sarthak-sharma:~$ alias sarthak="touch /tmp/aliastesting"
ttn@sarthak-sharma:~$ sarthak
ttn@sarthak-sharma:~$
```

12. Edit ~/.bashrc file such that when you change to "test" user it should clear the screen and print "Welcome".

```
ttn@sarthak-sharma:~$ sudo su - test
test@sarthak-sharma:~$ echo clear >> .bashrc
test@sarthak-sharma:~$ echo "echo welcome" >> .bashrc
test@sarthak-sharma:~$ exit
logout
ttn@sarthak-sharma:~$ sudo su - test

welcome
test@sarthak-sharma:~$ exit
logout
ttn@sarthak-sharma:~$
```

13. Install “zip” package.

```
ttn@sarthak-sharma:~$ sudo apt-get install zip
[sudo] password for ttn:
Reading package lists... Done
Building dependency tree
Reading state information... Done
zip is already the newest version (3.0-11build1).
0 upgraded, 0 newly installed, 0 to remove and 375 not upgraded.
ttn@sarthak-sharma:~$
```

14. Compress "output" and "password_backup" files into a tar ball. List the files present inside the tar created.

```
ttn@sarthak-sharma:/etc$ sudo tar cvf archive.tar  output.txt passwd_backup
output.txt
passwd_backup
ttn@sarthak-sharma:/etc$
```

15. scp this file to test user

```
root@sarthak-sharma:~# chown test /etc/archive.tar
root@sarthak-sharma:~# scp /etc/archive.tar test@192.168.43.242:/etc/
test@192.168.43.242's password:
archive.tar                                   100%   10KB   9.2MB/s   00:00
root@sarthak-sharma:~#
```

16. Unzip this tar bar by logging into the remote server

```
test@sarthak-sharma:/etc$ tar xf archive.tar
tar: output.txt: Cannot open: File exists
tar: passwd_backup: Cannot open: File exists
tar: Exiting with failure status due to previous errors
test@sarthak-sharma:/etc$
```

17. Download any image from web and move to desktop

```
ttn@sarthak-sharma:~/Desktop$ wget -A jpeg,jpg,bmp,gif,png https://assets.goodst
atic.com/s3/magazine/others/meta/GoodLogo2.png
--2019-02-04 22:28:53--  https://assets.goodstatic.com/s3/magazine/others/meta/G
oodLogo2.png
Resolving assets.goodstatic.com (assets.goodstatic.com)... 2606:4700:30::681f:50
d6, 2606:4700:30::681f:51d6, 104.31.80.214, ...
Connecting to assets.goodstatic.com (assets.goodstatic.com)|2606:4700:30::681f:5
0d6|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1465 (1.4K) [image/png]
Saving to: ‘GoodLogo2.png’

GoodLogo2.png       100%[===================>]   1.43K  --.-KB/s    in 0s

2019-02-04 22:28:54 (11.6 MB/s) - ‘GoodLogo2.png’ saved [1465/1465]

ttn@sarthak-sharma:~/Desktop$
```

18. How to get help of commands usages.

```
ttn@sarthak-sharma:~/Desktop$ wget --help
GNU Wget 1.19.4, a non-interactive network retriever.
Usage: wget [OPTION]... [URL]...

Mandatory arguments to long options are mandatory for short options too.

Startup:
  -V,  --version                   display the version of Wget and exit
  -h,  --help                      print this help
  -b,  --background                go to background after startup
  -e,  --execute=COMMAND           execute a `.wgetrc'-style command

Logging and input file:
  -o,  --output-file=FILE          log messages to FILE
  -a,  --append-output=FILE        append messages to FILE
  -d,  --debug                     print lots of debugging information
  -q,  --quiet                     quiet (no output)
  -v,  --verbose                   be verbose (this is the default)
  -nv, --no-verbose                turn off verboseness, without being quiet
       --report-speed=TYPE         output bandwidth as TYPE.  TYPE can be bits
  -i,  --input-file=FILE           download URLs found in local or external FILE
  -F,  --force-html                treat input file as HTML
  -B,  --base=URL                  resolves HTML input-file links (-i -F)
                                     relative to URL
       --config=FILE               specify config file to use
       --no-config                 do not read any config file
       --rejected-log=FILE         log reasons for URL rejection to FILE

Download:
  -t,  --tries=NUMBER              set number of retries to NUMBER (0 unlimits)
       --retry-connrefused         retry even if connection is refused
  -O,  --output-document=FILE      write documents to FILE
  -nc, --no-clobber                skip downloads that would download to
                                     existing files (overwriting them)
       --no-netrc                  don't try to obtain credentials from .netrc
  -c,  --continue                  resume getting a partially-downloaded file
```

19. Create a symlink of /etc/services into /tmp/ports-info

```
ttn@sarthak-sharma:~$ sudo ln -sf /tmp/port-info  /etc/services
ttn@sarthak-sharma:~$
```

20. You are appointed as a Software/DevOps Engineer in ABC media services. On your first day you need to troubleshoot a problem. There is a command “xyz” somewhere installed in that linux system. But as a new joinee you do not have any idea about where is that Installed. How can you check that?

To locate the command “xyz”, we have to use the whereis command.

“Whereis” search for executables, source files, and manual pages using a database built by system automatically