# Introduction to Linux Exercise

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

```
ttn@ttn:~$ pwd
/home/ttn
ttn@ttn:~$ ls
Desktop    Downloads         Music  Pictures  Templates
Documents  examples.desktop  nav    Public    Videos
ttn@ttn:~$ mkdir -p exercise/dir1/dir2/dir3
ttn@ttn:~$
```

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

```
ttn@ttn:~$ mkdir -p exercise/dir1/dir2/dir3
ttn@ttn:~$ cd exercise/dir1/dir2/
ttn@ttn:~/exercise/dir1/dir2$ touch emptyFile1 emptyFile2
ttn@ttn:~/exercise/dir1/dir2$ ls
dir3  emptyFile1  emptyFile2
ttn@ttn:~/exercise/dir1/dir2$
```

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

```
ttn@ttn:~$ cat > file.txt
hello world
ttn@ttn:~$ cat file.txt
hello world
ttn@ttn:~$
```

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

```
ttn@ttn:~$ cd /etc
ttn@ttn:/etc$ cd
ttn@ttn:~$ cd exercise/
ttn@ttn:~/exercise$ cp /etc/passwd passwd_copy
ttn@ttn:~/exercise$ ls
dir1  passwd_copy
ttn@ttn:~/exercise$ cp passwd_copy passwd_backup
ttn@ttn:~/exercise$ ls
dir1  passwd_backup  passwd_copy
ttn@ttn:~/exercise$ rm passwd_backup
ttn@ttn:~/exercise$ ls
dir1  passwd_copy
ttn@ttn:~/exercise$ mv passwd_copy passwd_backup
ttn@ttn:~/exercise$ ls
dir1  passwd_backup
ttn@ttn:~/exercise$
```

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

**Less command:**

```
ttn@ttn:~/exercise$ less passwd_backup
ttn@ttn:~/exercise$
```

```
_apt:x:104:65534::/nonexistent:/usr/sbin/nologin
uuidd:x:105:111::/run/uuidd:/usr/sbin/nologin
avahi-autoipd:x:106:112:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/
nologin
usbmux:x:107:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:108:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
rtkit:x:109:114:RealtimeKit,,,:/proc:/usr/sbin/nologin
cups-pk-helper:x:110:116:user for cups-pk-helper service,,,:/home/cups-pk-helper
:/usr/sbin/nologin
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/
false
whoopsie:x:112:117::/nonexistent:/bin/false
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/:/usr/sbin/nologin
saned:x:114:119::/var/lib/saned:/usr/sbin/nologin
pulse:x:115:120:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
colord:x:117:123:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/no
login
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
geoclue:x:119:124::/var/lib/geoclue:/usr/sbin/nologin
gnome-initial-setup:x:120:65534::/run/gnome-initial-setup/:/bin/false
gdm:x:121:125:Gnome Display Manager:/var/lib/gdm3:/bin/false
ttn:x:1000:1000:TTN,,,:/home/ttn:/bin/bash
(END)
```

**More command:**

```
ttn@ttn:~/exercise$ 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
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
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologi
n
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/
sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nol
ogin
--More--(43%)
```

**Cat command:**

```
ttn@ttn:~/exercise$ 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
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologi
n
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/
sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nol
```

**Stirngs command:**

```
ttn@ttn:~/exercise$ 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
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
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologi
n
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/
sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nol
```

**Head and tail command:**

```
ttn@ttn:~/exercise$ head -10 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
ttn@ttn:~/exercise$ tail -10 passwd_backup
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/:/usr/sbin/nologin
saned:x:114:119::/var/lib/saned:/usr/sbin/nologin
pulse:x:115:120:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
colord:x:117:123:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/no
login
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
geoclue:x:119:124::/var/lib/geoclue:/usr/sbin/nologin
gnome-initial-setup:x:120:65534::/run/gnome-initial-setup/:/bin/false
gdm:x:121:125:Gnome Display Manager:/var/lib/gdm3:/bin/false
ttn:x:1000:1000:TTN,,,:/home/ttn:/bin/bash
ttn@ttn:~/exercise$
```

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

```
ttn@ttn:~/exercise$ ls
dir1  passwd_backup
ttn@ttn:~/exercise$ grep "/bin/false" passwd_backup | wc -l
5
ttn@ttn:~/exercise$
```

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

```
ttn@ttn:~/exercise$ head -5 passwd_backup | cat > output
ttn@ttn:~/exercise$ ls
dir1  output  passwd_backup
ttn@ttn:~/exercise$ cat output
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
ttn@ttn:~/exercise$
```

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

```
ttn@ttn:~/exercise$ sudo useradd test
[sudo] password for ttn:
ttn@ttn:~/exercise$ id test
uid=1001(test) gid=1001(test) groups=1001(test)
ttn@ttn:~/exercise$
```

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

```
ttn@ttn:~/exercise$ cd dir1/dir2/
ttn@ttn:~/exercise/dir1/dir2$ ls -l
total 4
drwxr-xr-x 2 ttn ttn 4096 Feb  2 14:14 dir3
-rw-r--r-- 1 ttn ttn    0 Feb  2 14:24 emptyFile1
-rw-r--r-- 1 ttn ttn    0 Feb  2 14:24 emptyFile2
ttn@ttn:~/exercise/dir1/dir2$ touch emptyFile1 emptyFile2
ttn@ttn:~/exercise/dir1/dir2$ ls -l
total 4
drwxr-xr-x 2 ttn ttn 4096 Feb  2 14:14 dir3
-rw-r--r-- 1 ttn ttn    0 Feb  2 15:13 emptyFile1
-rw-r--r-- 1 ttn ttn    0 Feb  2 15:13 emptyFile2
ttn@ttn:~/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**

```
ttn@ttn:~/exercise$ head -5 passwd_backup | cat > output
ttn@ttn:~/exercise$ ls
dir1  output  passwd_backup
ttn@ttn:~/exercise$ cat output
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
ttn@ttn:~/exercise$ su test
Password:
$ cat > output
sh: 1: cannot create output: Permission denied
$ su
Password:
root@ttn:/home/ttn/exercise# sudo chown ttn:test output
root@ttn:/home/ttn/exercise# ls -l
total 12
drwxr-xr-x 3 ttn ttn  4096 Feb  2 14:14 dir1
-rw-r--r-- 1 ttn test  189 Feb  2 16:08 output
-rw-r--r-- 1 ttn ttn  2398 Feb  2 14:41 passwd_backup
root@ttn:/home/ttn/exercise# su test
$ chmod 777 output
chmod: changing permissions of 'output': Operation not permitted
$ sudo chmod 777 output
[sudo] password for test:
test is not in the sudoers file.  This incident will be reported.
$ cat > output
sh: 3: cannot create output: Permission denied
$ exit
root@ttn:/home/ttn/exercise# exit
exit
$ exit
ttn@ttn:~/exercise$
```

**2.Make the file editable to the world so that test user can access it. Revert the changes after verification**

```
ttn@ttn:~/exercise$ ls
dir1  output  passwd_backup
ttn@ttn:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn ttn 4096 Feb  2 14:14 dir1
-rw-r--r-- 1 ttn ttn  189 Feb  2 16:34 output
-rw-r--r-- 1 ttn ttn 2398 Feb  2 14:41 passwd_backup
ttn@ttn:~/exercise$ chmod o+w output
ttn@ttn:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn ttn 4096 Feb  2 14:14 dir1
-rw-r--rw- 1 ttn ttn  189 Feb  2 16:34 output
-rw-r--r-- 1 ttn ttn 2398 Feb  2 14:41 passwd_backup
ttn@ttn:~/exercise$ su test
Password:
$ cat > output
hello to the new
$ cat output
hello to the new
$ exit
ttn@ttn:~/exercise$ rm output
ttn@ttn:~/exercise$ head -5 passwd_backup | cat > output
ttn@ttn:~/exercise$
```

**3.Change the ownership to edit the file.**

```
ttn@ttn:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn ttn 4096 Feb  2 14:14 dir1
-rw-r--r-- 1 ttn ttn  189 Feb  2 16:36 output
-rw-r--r-- 1 ttn ttn 2398 Feb  2 14:41 passwd_backup
ttn@ttn:~/exercise$ chown test:ttn output
chown: changing ownership of 'output': Operation not permitted
ttn@ttn:~/exercise$ sudo chown test:ttn output
[sudo] password for ttn:
ttn@ttn:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn  ttn 4096 Feb  2 14:14 dir1
-rw-r--r-- 1 test ttn  189 Feb  2 16:36 output
-rw-r--r-- 1 ttn  ttn 2398 Feb  2 14:41 passwd_backup
ttn@ttn:~/exercise$
```

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

```
ttn@ttn:~/exercise$ alias naveen="touch /etc/aliastesting"
ttn@ttn:~/exercise$ naveen
touch: cannot touch '/etc/aliastesting': Permission denied
ttn@ttn:~/exercise$ alias naveen="sudo touch /etc/aliastesting"
ttn@ttn:~/exercise$ naveen
ttn@ttn:~/exercise$ ls /etc
acpi                        hosts               popularity-contest.conf
adduser.conf                hosts.allow         ppp
aliastesting                hosts.deny          printcap
alternatives                hp                  profile
anacrontab                  ifplugd             profile.d
apg.conf                    ImageMagick-6       protocols
apm                         init                pulse
apparmor                    init.d              python2.7
apparmor.d                  initramfs-tools     python3
apport                      inputrc             python3.6
appstream.conf              insserv.conf.d      rc0.d
```

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

```
ttn@ttn:~$ sudo adduser user1
adduser: The user `user1' already exists.
ttn@ttn:~$ ssh user1@localhost
user1@localhost's password:
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 4.15.0-135-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch

2 packages can be updated.
2 of these updates are security updates.
To see these additional updates run: apt list --upgradable

New release '20.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Tue Feb  2 23:02:54 2021 from 127.0.0.1
user1@ttn:~$ vim .bashrc
```

### clear and welcome message in .bashrc file

```
clear
echo "welcome"
~
~
-- INSERT --                                                    119,15        Bot
```

```
user1@ttn:~$ vim .bashrc
user1@ttn:~$ exit
logout
Connection to localhost closed.
ttn@ttn:~$ ssh user1@localhost
```

```
welcome
user1@ttn:~$
```

```
welcome
user1@ttn:~$ exit
logout
Connection to localhost closed.
ttn@ttn:~$
```

**13. Install “zip” package.**

```
ttn@ttn:~$ sudo apt install zip
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 5 not upgraded.
ttn@ttn:~$ zip -v
Copyright (c) 1990-2008 Info-ZIP - Type 'zip "-L"' for software license.
This is Zip 3.0 (July 5th 2008), by Info-ZIP.
Currently maintained by E. Gordon.  Please send bug reports to
the authors using the web page at www.info-zip.org; see README for details.

Latest sources and executables are at ftp://ftp.info-zip.org/pub/infozip,
as of above date; see http://www.info-zip.org/ for other sites.

Compiled with gcc 6.3.0 20170415 for Unix (Linux ELF).

Zip special compilation options:
        USE_EF_UT_TIME       (store Universal Time)
        BZIP2_SUPPORT        (bzip2 library version 1.0.6, 6-Sept-2010)
            bzip2 code and library copyright (c) Julian R Seward
            (See the bzip2 license for terms of use)
        SYMLINK_SUPPORT      (symbolic links supported)
        LARGE_FILE_SUPPORT   (can read and write large files on file system)
```

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

```
ttn@ttn:~/exercise$ tar -czvf output_zip.tar.gz output passwd_backup
output
passwd_backup
ttn@ttn:~/exercise$ ls
dir1  output  output_zip.tar.gz  passwd_backup
ttn@ttn:~/exercise$ vim output_zip.tar.gz
ttn@ttn:~/exercise$
```

```
" tar.vim version v29
" Browsing tarfile /home/ttn/exercise/output_zip.tar.gz
" Select a file with cursor and press ENTER

output
passwd_backup
~
~
~
~
```

### 15. scp this file to test user

```
dir1  output  output_zip.tar.gz  passwd_backup
ttn@ttn:~/exercise$ sudo scp output_zip.tar.gz /home/test/
[sudo] password for ttn:
ttn@ttn:~/exercise$ su test
Password:
$ ls ~
examples.desktop  output_zip.tar.gz
$
```

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

```
$ cd ~
$ ls
examples.desktop  output_zip.tar.gz
$ tar -xf output_zip.tar.gz
$ ls
examples.desktop  output  output_zip.tar.gz  passwd_backup
$
```

### 17. Download any image from web and move to desktop

```
ttn@ttn:~$ wget https://www.electrictoolbox.com/images/icons/linux-bsd.gif
--2021-02-02 18:20:44--  https://www.electrictoolbox.com/images/icons/linux-bsd.gif
Resolving www.electrictoolbox.com (www.electrictoolbox.com)... 3.6.18.84, 3.6.118.31
Connecting to www.electrictoolbox.com (www.electrictoolbox.com)|3.6.18.84|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 805 [image/gif]
Saving to: ‘linux-bsd.gif.1’

linux-bsd.gif.1     100%[===================>]     805  --.-KB/s    in 0s

2021-02-02 18:20:45 (2.96 MB/s) - ‘linux-bsd.gif.1’ saved [805/805]

ttn@ttn:~$ ls
Desktop    examples.desktop  linux-bsd.gif    nav       Templates
Documents  exercise          linux-bsd.gif.1  Pictures  Videos
Downloads  file.txt          Music            Public
ttn@ttn:~$ mv linux-bsd.gif ~/Desktop/
ttn@ttn:~$ ls
Desktop    examples.desktop  linux-bsd.gif.1  Pictures   Videos
Documents  exercise          Music            Public
Downloads  file.txt          nav              Templates
ttn@ttn:~$ cd Desktop/
ttn@ttn:~/Desktop$ ls
linux-bsd.gif
```

**18. How to get help of commands usages.**

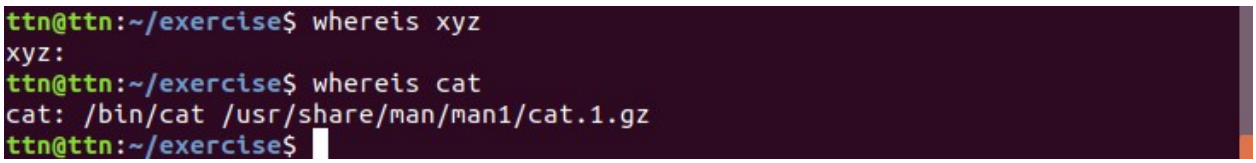
```
ttn@ttn:~/exercise$ cat --help
Usage: cat [OPTION]... [FILE]...
Concatenate FILE(s) to standard output.

With no FILE, or when FILE is -, read standard input.

  -A, --show-all           equivalent to -vET
  -b, --number-nonblank    number nonempty output lines, overrides -n
  -e                       equivalent to -vE
  -E, --show-ends          display $ at end of each line
  -n, --number             number all output lines
  -s, --squeeze-blank      suppress repeated empty output lines
  -t                       equivalent to -vT
  -T, --show-tabs          display TAB characters as ^I
  -u                       (ignored)
  -v, --show-nonprinting   use ^ and M- notation, except for LFD and TAB
      --help     display this help and exit
      --version  output version information and exit

Examples:
  cat f - g  Output f's contents, then standard input, then g's contents.
```

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

```
ttn@ttn:~/exercise$ ln -s /etc/services /tmp/ports-info
ttn@ttn:~/exercise$ ls -l
total 16
drwxr-xr-x 3 ttn  ttn 4096 Feb  2 14:14 dir1
-rw-r--r-- 1 test ttn  189 Feb  2 16:36 output
-rw-r--r-- 1 ttn  ttn 1031 Feb  2 17:40 output_zip.tar.gz
-rw-r--r-- 1 ttn  ttn 2398 Feb  2 14:41 passwd_backup
ttn@ttn:~/exercise$ ls -l /tmp
total 36
-rw------- 1 ttn  ttn     0 Feb  2 09:18 config-err-I7so6U
drwx------ 2 ttn  ttn  4096 Feb  2 15:45 lu7088nr6dt8.tmp
srwxrwxr-x 1 ttn  ttn     0 Feb  2 14:11 OSL_PIPE_1000_SingleOfficeIPC_cfa729fc6
7be8cf99063327bc0904361
lrwxrwxrwx 1 ttn  ttn    13 Feb  2 18:36 ports-info -> /etc/services
drwx------ 2 ttn  ttn  4096 Feb  2 09:18 ssh-xPj6glwjJvhv
drwx------ 3 root root 4096 Feb  2 09:18 systemd-private-46808a80c6c045ab98df88d
3e82c9c19-bolt.service-a9OYq7
drwx------ 3 root root 4096 Feb  2 09:18 systemd-private-46808a80c6c045ab98df88d
3e82c9c19-colord.service-jEwoBI
drwx------ 3 root root 4096 Feb  2 18:27 systemd-private-46808a80c6c045ab98df88d
3e82c9c19-fwupd.service-o5ry7V
```

**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?**

**Sol. - Whereis command is used**


ttn@ttn:~/exercise$ whereis xyz
xyz:
ttn@ttn:~/exercise$ whereis cat
cat: /bin/cat /usr/share/man/man1/cat.1.gz
ttn@ttn:~/exercise$