After you have logged into the system, do the following.
1.Invoke **pwd** to see your current working directory (there should be your home directory).

```
mariia@mariia-VirtualBox:~$ pwd
/home/mariia
```

2. Collect output of these commands
ls -l /

This command not only shows files and directories in root directory (because there is /), but also provides information about permissions, owner, size, date and time of the last modification, links and format. So, it shows longer version of ls information.

```
mariia@mariia-VirtualBox:~$ ls -l /
total 483908
drwxr-xr-x   2 root root      4096 кві  3 13:07 bin
drwxr-xr-x   3 root root      4096 кві 11 14:24 boot
drwxrwxr-x   2 root root      4096 бер 24 16:58 cdrom
drwxr-xr-x  18 root root      4280 кві 11 14:20 dev
drwxr-xr-x 128 root root     12288 кві  9 15:57 etc
drwxr-xr-x   3 root root      4096 бер 24 16:59 home
lrwxrwxrwx   1 root root        32 кві  9 15:59 initrd.img -> boot/initrd.img-5.3.0-46-generic
lrwxrwxrwx   1 root root        32 кві  9 15:59 initrd.img.old -> boot/initrd.img-5.3.0-45-generic
drwxr-xr-x  22 root root      4096 кві  1 16:13 lib
drwxr-xr-x   2 root root      4096 лют  3 20:22 lib64
drwx------   2 root root     16384 бер 24 16:55 lost+found
drwxr-xr-x   4 root root      4096 бер 25 15:27 media
drwxr-xr-x   2 root root      4096 лют  3 20:22 mnt
drwxr-xr-x   4 root root      4096 кві  2 13:22 opt
dr-xr-xr-x 281 root root         0 кві 11 14:19 proc
drwx------   7 root root      4096 кві 11 14:22 root
drwxr-xr-x  33 root root      1040 кві 11 14:24 run
drwxr-xr-x   2 root root     12288 кві 11 14:22 sbin
drwxr-xr-x  13 root root      4096 кві  2 19:54 snap
drwxr-xr-x   2 root root      4096 лют  3 20:22 srv
-rw-------   1 root root 495416320 бер 24 16:55 swapfile
dr-xr-xr-x  13 root root         0 кві 11 14:19 sys
drwxrwxrwt  15 root root      4096 кві 11 14:24 tmp
drwxr-xr-x  11 root root      4096 лют  3 20:25 usr
drwxr-xr-x  14 root root      4096 лют  3 20:30 var
-rw-------   1 root root         0 кві 11 14:22 VBox.log
lrwxrwxrwx   1 root root        29 кві  9 15:59 vmlinuz -> boot/vmlinuz-5.3.0-46-generic
lrwxrwxrwx   1 root root        29 кві  9 15:59 vmlinuz.old -> boot/vmlinuz-5.3.0-45-generic
mariia@mariia-VirtualBox:~$
```

ls

Shows files and directories in a current directory. In this case this directory is /home/mariia:

```
mariia@mariia-VirtualBox:~$ ls
Desktop     Documents   examples.desktop   mybox.tar         NanofileMariia        Pictures  snap       ubuntu.tar
documents   Downloads   Music              Nanoback.txt      NanofileMariiaBack    Public    Templates  Videos
```

ls ~

Shows files and directories in a home directory (even if we are in another directory).

```
mariia@mariia-VirtualBox:/$ ls ~
Desktop     Documents   examples.desktop   mybox.tar         NanofileMariia        Pictures  snap       ubuntu.tar
documents   Downloads   Music              Nanoback.txt      NanofileMariiaBack    Public    Templates  Videos
```

ls -l

This command shows longer version of ls information in a current directory.

```
mariia@mariia-VirtualBox:~$ ls -l
total 130168
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Desktop
drwxr-xr-x 2 mariia mariia     4096 квi  1 18:08 documents
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Documents
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Downloads
-rw-r--r-- 1 mariia mariia     8980 бер 24 16:59 examples.desktop
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Music
-rw-r--r-- 1 mariia mariia 66612224 квi  2 18:01 mybox.tar
-rw-r--r-- 1 root   root       15 квi  1 17:52 Nanoback.txt
-rw-r--r-- 1 mariia mariia       15 квi  1 17:52 NanofileMariia
-rw-r--r-- 1 mariia mariia       15 квi  1 18:09 NanofileMariiaBack
drwxr-xr-x 2 mariia mariia     4096 квi  9 19:10 Pictures
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Public
drwxr-xr-x 3 mariia mariia     4096 квi  2 15:22 snap
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Templates
-rw-r--r-- 1 mariia mariia 66612224 квi  2 15:53 ubuntu.tar
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Videos
```

ls -a

It shows all files and directories in a current directory, even hidden (they are starting with .).

```
mariia@mariia-VirtualBox:~$ ls -a
.               Desktop            .kube            NanofileMariiaBack         Templates
..              documents          .local           Pictures                  ubuntu.tar
.bash_history   Documents          .mozilla         .profile                  .vboxclient-display.pid
.bash_logout    Downloads          Music            Public                    .vboxclient-draganddrop.pid
.bashrc         examples.desktop   mybox.tar        snap                      .vboxclient-seamless.pid
.cache          .gnupg             Nanoback.txt     .ssh                      Videos
.config         .ICEauthority      NanofileMariia   .sudo_as_admin_successful
```

ls -la

Shows longer version of ls for current directory (with owner, permission, etc) and enables display of hidden files and directories.

```
mariia@mariia-VirtualBox:~$ ls -la
total 130248
drwxr-xr-x 19 mariia mariia     4096 кві 11 14:24 .
drwxr-xr-x  3 root   root       4096 бер 24 16:59 ..
-rw-------  1 mariia mariia     5964 кві  9 19:17 .bash_history
-rw-r--r--  1 mariia mariia      220 бер 24 16:59 .bash_logout
-rw-r--r--  1 mariia mariia     3771 бер 24 16:59 .bashrc
drwx------ 15 mariia mariia     4096 кві  9 16:07 .cache
drwx------ 15 mariia mariia     4096 кві  1 18:06 .config
drwxr-xr-x  2 mariia mariia     4096 бер 24 17:08 Desktop
drwxr-xr-x  2 mariia mariia     4096 кві  1 18:08 documents
drwxr-xr-x  2 mariia mariia     4096 бер 24 17:08 Documents
drwxr-xr-x  2 mariia mariia     4096 бер 24 17:08 Downloads
-rw-r--r--  1 mariia mariia     8980 бер 24 16:59 examples.desktop
drwx------  3 mariia mariia     4096 кві  9 16:16 .gnupg
-rw-------  1 mariia mariia    10860 кві 11 14:23 .ICEauthority
drwxr-x---  4 root   root       4096 кві  2 15:22 .kube
drwx------  3 mariia mariia     4096 бер 24 17:08 .local
drwx------  5 mariia mariia     4096 бер 25 13:33 .mozilla
drwxr-xr-x  2 mariia mariia     4096 бер 24 17:08 Music
-rw-r--r--  1 mariia mariia 66612224 кві  2 18:01 mybox.tar
-rw-r--r--  1 root   root         15 кві  1 17:52 Nanoback.txt
-rw-r--r--  1 mariia mariia       15 кві  1 17:52 NanofileMariia
-rw-r--r--  1 mariia mariia       15 кві  1 18:09 NanofileMariiaBack
drwxr-xr-x  2 mariia mariia     4096 кві  9 19:10 Pictures
-rw-r--r--  1 mariia mariia      807 бер 24 16:59 .profile
drwxr-xr-x  2 mariia mariia     4096 бер 24 17:08 Public
drwxr-xr-x  3 mariia mariia     4096 кві  2 15:22 snap
drwx------  2 mariia mariia     4096 кві  9 16:16 .ssh
-rw-r--r--  1 mariia mariia        0 бер 25 15:46 .sudo_as_admin_successful
drwxr-xr-x  2 mariia mariia     4096 бер 24 17:08 Templates
-rw-r--r--  1 mariia mariia 66612224 кві  2 15:53 ubuntu.tar
-rw-r-----  1 mariia mariia        5 кві 11 14:23 .vboxclient-display.pid
-rw-r-----  1 mariia mariia        5 кві 11 14:23 .vboxclient-draganddrop.pid
-rw-r-----  1 mariia mariia        5 кві 11 14:23 .vboxclient-seamless.pid
drwxr-xr-x  2 mariia mariia     4096 бер 24 17:08 Videos
```

ls -lda ~

Shows long information (-l) about home directory (~) itself (-d), even if it is hidden(-a).

```
mariia@mariia-VirtualBox:~$ ls -lda ~
drwxr-xr-x 19 mariia mariia 4096 кві 11 14:24 /home/mariia
```

Note differences between produced outputs. Describe (in few words) purposes of these commands.

3. Execute and describe the following commands (store the output, if any):

mkdir test
cd test
pwd
touch test.txt
ls -l test.txt
mkdir test2
mv test.txt test2
cd test2
ls

mv test.txt test2.txt
ls
cp test2.txt ..
cd ..
ls
rm test2.txt
rmdir test2

In a home directory we are creating a new directory test and entering this new directory (mkdir and cd). Then checking, that we are in test folder with the help of pwd. Making a new empty file test.txt in a current directory (touch) and checking full information about this file (ls -l). Then, creating new folder test2 in a current directory (test). After that, we are moving test.txt to the test2 folder, entering test2 and checking that this file test.txt is here now. With the help of mv command, renaming test.txt to test2.txt. As we can see, now in the folder there is only test2.txt file. Next, we can copy test2.txt to the test directory (cp ..), and checking that there is such file there now. Finally, we are removing test2.txt and test2 folder (we can`t do that, because test2.txt is still there).

```
mariia@mariia-VirtualBox:~$ mkdir test
mariia@mariia-VirtualBox:~$ cd test
mariia@mariia-VirtualBox:~/test$ pwd
/home/mariia/test
mariia@mariia-VirtualBox:~/test$ touch test.txt
mariia@mariia-VirtualBox:~/test$ ls -l test.txt
-rw-r--r-- 1 mariia mariia 0 кві 11 15:29 test.txt
mariia@mariia-VirtualBox:~/test$ mkdir test2
mariia@mariia-VirtualBox:~/test$ mv test.txt test2
mariia@mariia-VirtualBox:~/test$ cd test2
mariia@mariia-VirtualBox:~/test/test2$ ls
test.txt
mariia@mariia-VirtualBox:~/test/test2$ mv test.txt test2.txt
mariia@mariia-VirtualBox:~/test/test2$ ls
test2.txt
mariia@mariia-VirtualBox:~/test/test2$ cp test2.txt ..
mariia@mariia-VirtualBox:~/test/test2$ cd ..
mariia@mariia-VirtualBox:~/test$ ls
test2  test2.txt
mariia@mariia-VirtualBox:~/test$ rm test2.txt
mariia@mariia-VirtualBox:~/test$ rmdir test2
rmdir: failed to remove 'test2': Directory not empty
```

To delete not empty directory rm -r command can be used:

```
mariia@mariia-VirtualBox:~/test$ rm -r test2
mariia@mariia-VirtualBox:~/test$ ls
```

4. Execute and describe the difference
cat /etc/fstab
less /etc/fstab
more /etc/fstab

Less shows one page at a time (navigation though file is possible with page up/down keys) and that is why it can be a little bit faster (it doesn`t load the entire file at once). It also has more functions then more.

More also shows one page at a time, but it loads entire file before that.

Cat outputs the content of the file in the console, it also can show a few files in one output – one by one.

```
mariia@mariia-VirtualBox:~/test$ cat /etc/fstab
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=3a501af9-4092-4167-a6f0-434e93950c8d /               ext4    errors=remount-ro 0       1
/swapfile                                 none            swap    sw              0       0
mariia@mariia-VirtualBox:~/test$ less /etc/fstab
mariia@mariia-VirtualBox:~/test$ more /etc/fstab
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=3a501af9-4092-4167-a6f0-434e93950c8d /               ext4    errors=remount-ro 0       1
/swapfile                                 none            swap    sw              0       0
mariia@mariia-VirtualBox:~/test$ 
```

```
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=3a501af9-4092-4167-a6f0-434e93950c8d /               ext4    errors=remount-ro 0       1
/swapfile                                 none            swap    sw              0       0
~
~
~
```

5. Add to archive all 'test' directories.
   a. to the pure 'tar';
   b. to the zipped 'tar' with only tar command;
   c. to the zipped 'tar' with gzip command;
   extract from archives all above.

tar command helps to add files and folders to archive or to extract them, with or without compression (if with: -z is used). To compress a file, gzip command can be used (and gunzip – to decompress), but it can`t compress a folder. When compression of an archive is needed, it is better to use tar – it is more effective.

```
mariia@mariia-VirtualBox:~$ tar -cvf test1.tar test
test/
test/test2/
test/test2.txt
mariia@mariia-VirtualBox:~$ ls -l
total 130188
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Desktop
drwxr-xr-x 2 mariia mariia     4096 кві  1 18:08 documents
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Documents
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Downloads
-rw-r--r-- 1 mariia mariia     8980 бер 24 16:59 examples.desktop
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Music
-rw-r--r-- 1 mariia mariia 66612224 кві  2 18:01 mybox.tar
-rw-r--r-- 1 root   root       15 кві  1 17:52 Nanoback.txt
-rw-r--r-- 1 mariia mariia       15 кві  1 17:52 NanofileMariia
-rw-r--r-- 1 mariia mariia       15 кві  1 18:09 NanofileMariiaBack
drwxr-xr-x 2 mariia mariia     4096 кві  9 19:10 Pictures
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Public
drwxr-xr-x 3 mariia mariia     4096 кві  2 15:22 snap
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Templates
drwxr-xr-x 3 mariia mariia     4096 кві 11 16:28 test
-rw-r--r-- 1 mariia mariia    10240 кві 11 16:46 test1.tar
-rwxr-xr-x 1 mariia mariia      170 кві 11 15:19 test.sh
-rw-r--r-- 1 mariia mariia 66612224 кві  2 15:53 ubuntu.tar
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Videos
mariia@mariia-VirtualBox:~$ tar -cvzf test2.tar test
test/
test/test2/
test/test2.txt
```

```
mariia@mariia-VirtualBox:~$ gzip test1.tar
mariia@mariia-VirtualBox:~$ ls -l
total 130184
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Desktop
drwxr-xr-x 2 mariia mariia     4096 квi  1 18:08 documents
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Documents
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Downloads
-rw-r--r-- 1 mariia mariia     8980 бер 24 16:59 examples.desktop
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Music
-rw-r--r-- 1 mariia mariia 66612224 квi  2 18:01 mybox.tar
-rw-r--r-- 1 root   root         15 квi  1 17:52 Nanoback.txt
-rw-r--r-- 1 mariia mariia       15 квi  1 17:52 NanofileMariia
-rw-r--r-- 1 mariia mariia       15 квi  1 18:09 NanofileMariiaBack
drwxr-xr-x 2 mariia mariia     4096 квi 11 16:49 Pictures
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Public
drwxr-xr-x 3 mariia mariia     4096 квi  2 15:22 snap
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Templates
drwxr-xr-x 3 mariia mariia     4096 квi 11 16:28 test
-rw-r--r-- 1 mariia mariia      174 квi 11 16:46 test1.tar.gz
-rw-r--r-- 1 mariia mariia      164 квi 11 16:47 test2.tar
-rwxr-xr-x 1 mariia mariia      170 квi 11 15:19 test.sh
-rw-r--r-- 1 mariia mariia 66612224 квi  2 15:53 ubuntu.tar
drwxr-xr-x 2 mariia mariia     4096 бер 24 17:08 Videos
mariia@mariia-VirtualBox:~$ gunzip test1.tar.gz
mariia@mariia-VirtualBox:~$ tar -xvf  test2.tar
test/
test/test2/
test/test2.txt
mariia@mariia-VirtualBox:~$ tar -xvf  test1.tar
test/
test/test2/
test/test2.txt
```

5. Look through man pages of the listed above commands.