A) Meaning of permissions.

Go to /etc folder. Show content of file passwd. Did you manage it? Explain why you can do it.

:~$ cd /etc
:/etc$ less passwd – file opens for reading
:/etc$ ls -l passwd

-rw-r--r-- 1 root root 1624 Aug 31 16:18 passwd - r (reading permissions) are available both for group and other.

Try also to open file shadow. Did you manage it? Explain.

:/etc$ less passwd – file doesn't open, error message came:
shadow: Permission denied

:/etc$ ls -l shadow
-rw-r----- 1 root shadow 1025 Sep 13 16:57 shadow - other have no permissions (three last dashes).

Copy file /etc/timezone to your home directory. Did it work? Explain.

:/etc$ cp timezone ~ - it works well
If we check timezone file, there are reading permissions for other. This allows us to copy this file.

Move file timezone from /etc to your home directory. Did it work?. Explain.

:/etc$ mv timezone ~ - It doesn't work. We can't move this file, because it has only reading permissions for other.

In folder /bin you will find many programs (commands). What permissions they have?

:/etc$ cd /bin
:/bin$ ls -l

The most of files inside this folders have all permissions for owner, writing and executing permissions for group, and executing permission for other.

What means x in permissions?

x stands for execute, or run.

Which permissions has your home directory? What does it mean?

:~$ ls -l / | head
drwxr-xr-x 17 ik0v ik0v 4096 Sep 24 21:02 ik0v

Folder has no restrictions for owner, writing and executing permissions both for group and other.

B) Permissions for files.

Use touch-command and create a file called myfile2.txt.

:~/Desktop$ touch myfile2.txt

Check file permissions. What does it mean in practical use? Can you write to this file?

:~/Desktop$ ls-l
-rw-r--r-- 1 ik0v ik0v 0 Sep 24 12:15 myfile2.txt

w – stands for writing permissions for owner, so answer is yes.

Can you read this file?

Yes, r – stands for reading permissions for owner.

Open myfile2.txt with nano command. Write something to a file, for example "Mikkel rev satt og skrev". Save file and close nano editor.

:~/Desktop$ nano minfil2.txt

… writing text
Ctrl+o
Ctrl+x

Change permissions on file myfile2.txt, from now only you can read this file.
Which permissions did u set?

:~/Desktop$ chmod 400 myfile2.txt

-r-------- 1 ik0v ik0v 0 Sep 24 12:20 myfile2.txt - only reading perm. for owner.

Try to open file with nano again.

:~/Desktop$ nano myfile2.txt
*[File ‘myfile2.txt’ is unwritable] – can only read this file.

Change permissions once again, set permissions to none for everybody, also for owner. Check if it works now.

:~/Desktop$ chmod 000 myfile2.txt
:~/Desktop$ ls-l
---------- 1 ik0v ik0v 0 Sep 24 12:25 myfile2.txt

:~/Desktop$ nano myfile2.txt
*[Error reading myfile2.txt: Permission denied] – can’t even read a file now.

C) Permissions for folders.

Create a folder named filecat. What permissions do you have for this folder? What does it mean?

:~/Desktop$ mkdir filecat
:~/Desktop$ ls-l
drwxr-xr-x 2 ik0v ik0v 4096 Sep 24 12:47 filecat

No restrictions for owner, or me because folder was created by me. Group and other have reading and executing permissions.

Check that these permissions work.

:~/Desktop$ cd filecat
:~/Desktop/filecat$ touch myfile0.txt
:~/Desktop/filecat$ cd..
:~/Desktop$ rm filecat/*
All these commands works fine.

Copy file myfile2.txt to folder filecat. Did it work?

:~/Desktop$ cp myfile2.txt filecat/
cp: cannot open ‘myfile2.txt’ for reading: Permission denied
It doesn’t work because we changed permissions to 0 earlier.

Set proper permissions for myfile2.txt. Make a copy of myfile2.txt and place it in folder filecat, name it myfile3.txt.

:~/Desktop$ chmod 600 myfile2.txt
:~/Desktop$ cp myfile2.txt filecat/myfile3.txt

Change permissions for folder filecat so that you can open folder and read content. Which permissions did you use? Check whether it works.

:~/Desktop$ chmod 500 filecat
:~/Desktop$ less filecat/myfile3.txt - it went well, we can read content of folder
:~/Desktop$ cp myfile2.txt filecat/myfile0.txt
cp: cannot create regular file ‘filecat/myfile0.txt’ for reading: Permission denied
We can’t create or remove existing files in filecat folder.

Check whether you can make a copy of file myfile2.txt named myfile4.txt.

:~/Desktop$ chmod 700 filecat
:~/Desktop$ cd filecat
:~/Desktop/filecat$ cp myfile2.txt myfile4.txt - now it works

Try to set only read access for folder filecat. What does it mean?

:~/Desktop$ chmod 400 filecat
It means that files in folder can only be listed out.

What permissions do you need to delete myfile3.txt?

:~/Desktop$ chmod 300 filecat
:~/Desktop$ rm filecat/myfile3.txt – write and execute permissions are enough to remove a file

What permissions do you need to add a text "pa ei lita tavle" to file myfile2.txt?

:~/Desktop$ chmod 100 filecat
:~/Desktop$ echo "pa ei lita tavle" >> filecat/myfile2.txt
Executing permission for folder is enough for that.

D) Finding files with certain permissions.

Go to one of your subfolders.

:~$ cd Desktop/filecat

Choose one file inside this folder and set reading permissions for everybody, incl. owner.

:~/Desktop/filkatt$ chmod 444 myfile4.txt

Find then same file by searching through your home folder with find command. Hint: check appropriate option in manual for find.

:~$ find -perm 444
./Desktop/filecat/myfile4.txt

Run find command again. Now you need to find same file and run ls -l command on it.

:~$ find -perm 444 -exec ls -l {} \;

Now you need to change permissions for files you have found. Set permissions to 411 to 3-4 files in your home directory.

:~$ chmod 411 Desktop/filecat/myfile4.txt
:~$ chmod 411 Desktop/myfile2.txt
:~$ chmod 411 foday.txt

Run chmod command on files you will find and set permissions on them to 640.

:~$ find -perm 444 -exec chmod 640 {} \;

E) Use of umask.

Set umask so that folders get standard permissions read, write and open for owner, read for group and no permissions for other.

:~$ umask 0037

What can you do to check if this umask command works?

:~/Desktop$ mkdir testF
:~/Desktop$ ls -l

drwxr----- 2 ik0v ik0v 4096 Sep 24 13:24 testF

What are standard permissions for new folders and files with this umask?

:~/Desktop$ touch testfile
:~/Desktop$ ls -l

drwxr----- 2 ik0v ik0v 4096 Sep 24 13:24 testF
- rw-r----- 1 ik0v ik0v 0 Sep 24 13:27 testfile

Permissions for folders: read, write and open for owner, read for group.
Permissions for files: read and write for owner, read for group.

Why there are different permissions for files and folders?

Execute or (x) for folders is necessary to open them.

What can you do to achieve permanent effect of this umask command?

Firstly we need to open file:

/etc/pam.d/common-session

and add a line:

session optional pam_umask.so

then we go to file:
/etc/login.defs

and update umask line with new value
UMASK *** (new value)