1) Analyze the structure of the /etc/passwd and /etc/group file, what fields are present in it, what users exist on the system? Specify several pseudo-users, how to define them?

```
root@CsnKhai:/home/student# cat /etc/passwd
root:x:0:0:Yulia,53,123,1234:/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/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
libuuid:x:100:101::/var/lib/libuuid:
syslog:x:101:104::/home/syslog:/bin/false
messagebus:x:102:105::/var/run/dbus:/bin/false
sshd:x:103:65534::/var/run/sshd:/usr/sbin/nologin
student:x:1000:1000:Student KhAI,,,:/home/student:/bin/bash
root@CsnKhai:/home/student#
```

```
root@CsnKhai:/home/student# cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,student
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:student
floppy:x:25:
tape:x:26:
sudo:x:27:student
audio:x:29:
dip:x:30:student
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
gnats:x:41:
shadow:x:42:
utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:student
staff:x:50:
games:x:60:
users:x:100:
nogroup:x:65534:
```

Pseudo-users can be identified uid. UID should be in range from 1 to 999.

2) What are the uid ranges? What is UID? How to define it?

The uid ranges from 0 to 65535. UID - unique identifier of the user within the system. We can define UID by command “id”.

```
root@CsnKhai:/home/student# id root
uid=0(root) gid=0(root) groups=0(root)
root@CsnKhai:/home/student# id student
uid=1000(student) gid=1000(student) groups=1000(student),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),109(lpadmin),110(sambashare)
root@CsnKhai:/home/student#
```

3) What is GID? How to define it?

GID - unique identifier of the group within the system to which the user belongs.

```
root@CsnKhai:/home/student# getent group root
root:x:0:
root@CsnKhai:/home/student# getent group student
student:x:1000:
root@CsnKhai:/home/student#
```

Also we can use “id” command to see GID.

4) How to determine belonging of user to the specific group?

```
root@CsnKhai:/home/student# groups root
root : root
root@CsnKhai:/home/student# groups student
student : student adm cdrom sudo dip plugdev lpadmin sambashare
```

5) What are the commands for adding a user to the system? What are the basic parameters required to create a user?

```
root@CsnKhai:/home/student# useradd yulia
root@CsnKhai:/home/student# useradd --help
Usage: useradd [options] LOGIN
       useradd -D
       useradd -D [options]

Options:
  -b, --base-dir BASE_DIR       base directory for the home directory of the
                                new account
  -c, --comment COMMENT         GECOS field of the new account
  -d, --home-dir HOME_DIR       home directory of the new account
  -D, --defaults                print or change default useradd configuration
  -e, --expiredate EXPIRE_DATE  expiration date of the new account
  -f, --inactive INACTIVE       password inactivity period of the new account
  -g, --gid GROUP               name or ID of the primary group of the new
                                account
  -G, --groups GROUPS           list of supplementary groups of the new
                                account
  -h, --help                    display this help message and exit
  -k, --skel SKEL_DIR           use this alternative skeleton directory
  -K, --key KEY=VALUE           override /etc/login.defs defaults
  -l, --no-log-init             do not add the user to the lastlog and
                                faillog databases
  -m, --create-home             create the user's home directory
  -M, --no-create-home          do not create the user's home directory
  -N, --no-user-group           do not create a group with the same name as
                                the user
  -o, --non-unique              allow to create users with duplicate
                                (non-unique) UID
  -p, --password PASSWORD       encrypted password of the new account
  -r, --system                  create a system account
  -R, --root CHROOT_DIR         directory to chroot into
  -s, --shell SHELL             login shell of the new account
  -u, --uid UID                 user ID of the new account
  -U, --user-group              create a group with the same name as the user
  -Z, --selinux-user SEUSER     use a specific SEUSER for the SELinux user mapping
```

```
root@CsnKhai:/home/student# useradd yulia2 -d /home/yulia3
root@CsnKhai:/home/student# useradd task -p 123
root@CsnKhai:/home/student#
```

6) How do I change the name (account name) of an existing user?

```
root@CsnKhai:/home/student# usermod task -l mytask
root@CsnKhai:/home/student# id mytask
uid=1003(mytask) gid=1003(task) groups=1003(task)
root@CsnKhai:/home/student#
```

7) What is skell_dir? What is its structure?

skel_dir - contains files which must be copied to the new user's home directory.

```
root@CsnKhai:~# tree -a /etc/skel
/etc/skel
├── .bash_logout
├── .bashrc
└── .profile

0 directories, 3 files
root@CsnKhai:~#
```

8) How to remove a user from the system (including his mailbox)?

```
root@CsnKhai:~# userdel -r yulia2
userdel: yulia2 mail spool (/var/mail/yulia2) not found
userdel: yulia2 home directory (/home/yulia3) not found
root@CsnKhai:~# cat /etc/passwd
root:x:0:0:Yulia,53,123,1234:/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/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
libuuid:x:100:101::/var/lib/libuuid:
syslog:x:101:104::/home/syslog:/bin/false
messagebus:x:102:105::/var/run/dbus:/bin/false
sshd:x:103:65534::/var/run/sshd:/usr/sbin/nologin
student:x:1000:1000:Student KhAI,,,:/home/student:/bin/bash
root@CsnKhai:~#
```

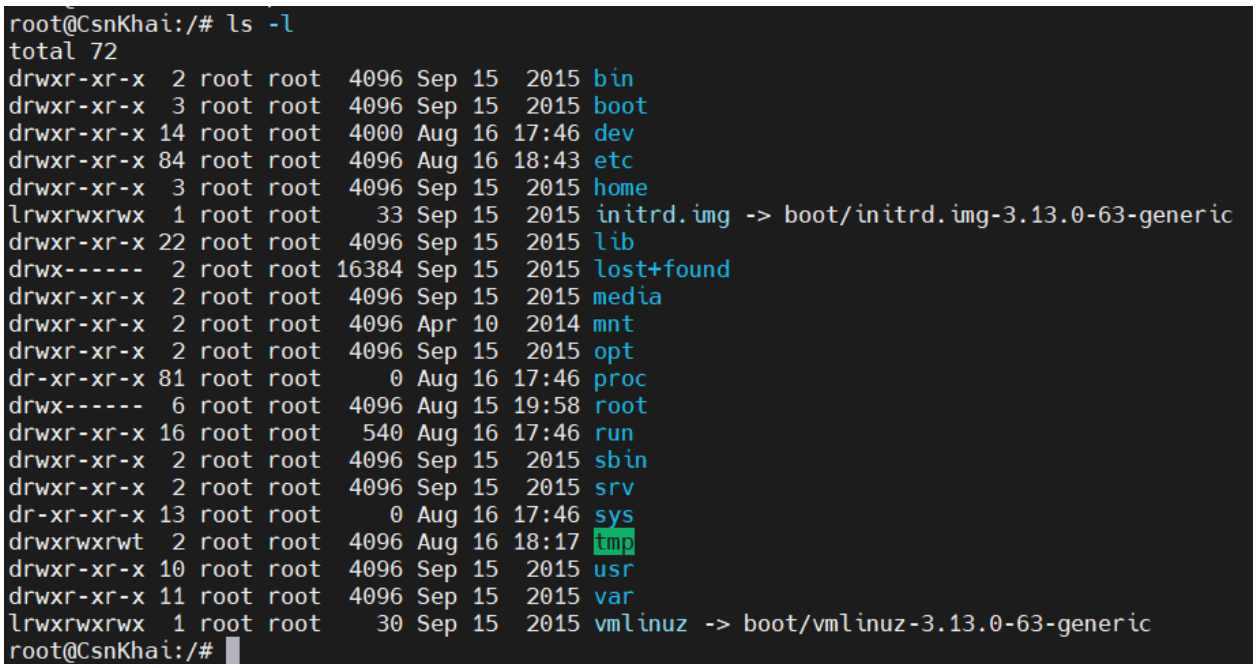
9) What commands and keys should be used to lock and unlock a user account?

```
root@CsnKhai:~# usermod -L myuser
root@CsnKhai:~# usermod -U myuser
```

10) How to remove a user's password and provide him with a password-free login for subsequent password change?

```
root@CsnKhai:~# passwd -d myuser
passwd: password expiry information changed.
```

11) Display the extended format of information about the directory, tell about the information columns displayed on the terminal.



Information: File Type and Permissions, Number of Links, Owner and Group, Size, Date and Time, Name.

12) What access rights exist and for whom (i. e., describe the main roles)?

Briefly describe the acronym for access rights.

"r" - Read:

- For the owner: Allows reading the content of the file.
- For the group: Allows members of the file's group to read the content of the file.
- For others: Allows anyone else to read the content of the file.

"w" - Write:

- For the owner: Allows modifying the content of the file.
- For the group: Allows members of the file's group to modify the content of the file.
- For others: Allows anyone else to modify the content of the file.

"x" - Execute:

- For the owner: Allows executing the file if it's a program or script.
- For the group: Allows members of the file's group to execute the file if it's a program or script.
- For others: Allows anyone else to execute the file if it's a program or script.

13) What is the sequence of defining the relationship between the file and the

user?

1. User Creation.

2. File Creation.
3. File Permissions.
4. Group Assignment.
5. Access Control.
6. Permission Enforcement.
7. Superuser.

14) What commands are used to change the owner of a file (directory), as well as the mode of access to the file? Give examples, demonstrate on the terminal.

```
root@CsnKhai:/# chown student myfile
root@CsnKhai:/# ls -l myfile
-rw-r--r-- 1 student root 0 Aug 16 18:59 myfile
root@CsnKhai:/# chown root myfile
root@CsnKhai:/# ls -l myfile
-rw-r--r-- 1 root root 0 Aug 16 18:59 myfile
root@CsnKhai:/# chown student myfile
root@CsnKhai:/# ls -l myfile
-rw-r--r-- 1 student root 0 Aug 16 18:59 myfile
root@CsnKhai:/#
```

```
root@CsnKhai:/# chmod 764 myfile
root@CsnKhai:/# ls -l myfile
-rwxrw-r-- 1 student root 0 Aug 16 18:59 myfile
```

15) What is an example of octal representation of access rights? Describe the umask command.

-rw-r-x---

650

The user's permissions are: rw- or 4+2=6

The group's permissions are: r-x or 4+1=5

The others's permissions are: --- or 0

16) Give definitions of sticky bits and mechanism of identifier substitution. Give an example of files and directories with these attributes.

The sticky bit is a permission attribute that can be applied to directories. When the sticky bit is set on a directory, only the owner of a file within that directory can delete or rename the file, regardless of the permissions of other users. This is commonly used on directories where multiple users might have write access to prevent accidental deletion of files by others.

```
root@CsnKhai:~# ls -l
total 8
drwxr-xr-x 2 root root 4096 Aug 16 19:19 dir
drwxr-xr-x 2 root root 4096 Aug 15 20:05 test
root@CsnKhai:~# chmod +t dir
root@CsnKhai:~# ls -l
total 8
drwxr-xr-t 2 root root 4096 Aug 16 19:19 dir
drwxr-xr-x 2 root root 4096 Aug 15 20:05 test
root@CsnKhai:~#
```

17) What file attributes should be present in the command script?

```
File: *manpages*,  Node: script,  Up: (dir)

SCRIPT(1)                        User Commands                        SCRIPT(1)

NAME
     script – make typescript of terminal session

SYNOPSIS
     script [-a] [-c command] [-e] [-f] [-q] [-t[=file]] [-V] [-h] [file]

DESCRIPTION
     script makes a typescript of everything printed on your terminal.  It is
     useful for students who need a hardcopy record of an interactive session
     as proof of an assignment, as the typescript file can be printed out
     later with lpr(1).

     If the argument file is given, script saves all dialogue in file.  If no
     file name is given, the typescript is saved in the file typescript.

     Options:

     -a, --append
            Append the output to file or typescript, retaining the prior con-
            tents.

     -c, --command command
            Run the command rather than an interactive shell.  This makes it
            easy for a script to capture the output of a program that behaves
            differently when its stdout is not a tty.

     -e, --return
            Return the exit code of the child process.  Uses the same format
            as bash termination on signal termination exit code is 128+n.

     -f, --flush
            Flush output after each write.  This is nice for telecooperation:
            one person does `mkfifo foo; script -f foo', and another can
            supervise real-time what is being done using `cat foo'.

     --force
-----Info: (*manpages*)script, 91 lines --Top-------------------------------------
```