

## Task1 (Part1)

1) Log in to the system as root.

The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window has a standard Windows-style title bar with minimize, maximize, and close buttons. The menu bar contains Russian text: "Файл" (File), "Машина" (Machine), "Вид" (View), "Ввод" (Input), "Устройства" (Devices), and "Справка" (Help). The main terminal area displays the following text:

```
Ubuntu 14.04.6 LTS CsnKhai tty1
CsnKhai login: student
Password:
Last login: Wed Feb 16 21:41:39 UTC 2022 on tty1
Welcome to Ubuntu 14.04.6 LTS (GNU/Linux 3.13.0-63-generic i686)

 * Documentation: https://help.ubuntu.com/
New release '16.04.7 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

student@CsnKhai:~$ sudo su
[sudo] password for student:
root@CsnKhai:/home/student#
```

The terminal window has a dark background and light-colored text. At the bottom, there is a toolbar with various icons, including a magnifying glass, a gear, a file folder, a clipboard, and a network icon. To the right of the toolbar, the text "Right Ctrl" is visible.

2) Use the passwd command to change the password. Examine the basic parameters of the command. What system file does it change \*?

```
Ubuntu [Работает] - Oracle VM VirtualBox
Файл  Машина  Вид  Ввод  Устройства  Справка
root@CsnKhai:/home/student# passwd student
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@CsnKhai:/home/student# _
```

The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window contains a command-line interface where the "passwd" command is being used to change the password for the "student" user. The user is prompted to enter a new password twice, and the message "password updated successfully" is displayed. The terminal window has a standard Linux-style menu bar at the top and a toolbar with various icons at the bottom.

The `passwd` program changes user account passwords. A normal user can only change the password of their own account, a superuser can change the password of any account. The `passwd` program also changes account information or password expiration. The `passwd` command modifies the `etc/passwd` file

## passwd command options:

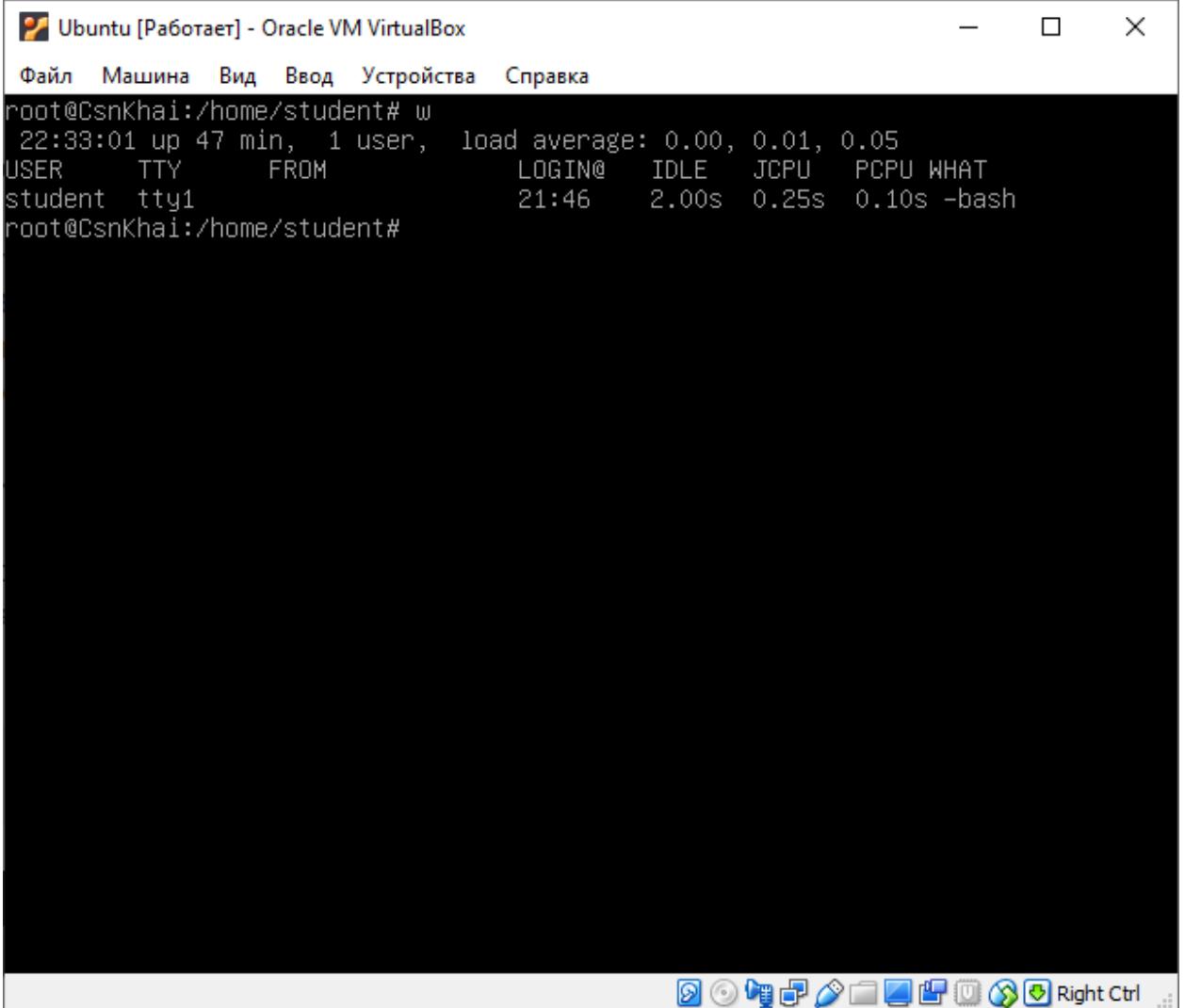
```
Options:
-a, --all          report password status on all accounts
-d, --delete       delete the password for the named account
-e, --expire       force expire the password for the named account
-h, --help         display this help message and exit
-k, --keep-tokens change password only if expired
-i, --inactive INACTIVE
                  set password inactive after expiration
                  to INACTIVE
-l, --lock          lock the password of the named account
-n, --mindays MIN_DAYS
                  set minimum number of days before password
                  change to MIN_DAYS
-q, --quiet         quiet mode
-r, --repository REPOSITORY
-R, --root CHROOT_DIR
-s, --status        report password status on the named account
-u, --unlock       unlock the password of the named account
-w, --warndays WARN_DAYS
-x, --maxdays MAX_DAYS
                  set expiration warning days to WARN_DAYS
                  set maximum number of days before password
                  change to MAX_DAYS
```

```
root@CsnKhai:/home/student#
```



3) Determine the users registered in the system, as well as what commands they execute. What additional information can be gleaned from the command execution?

Here will be displayed the number of commands executed by the user, and the user's work time

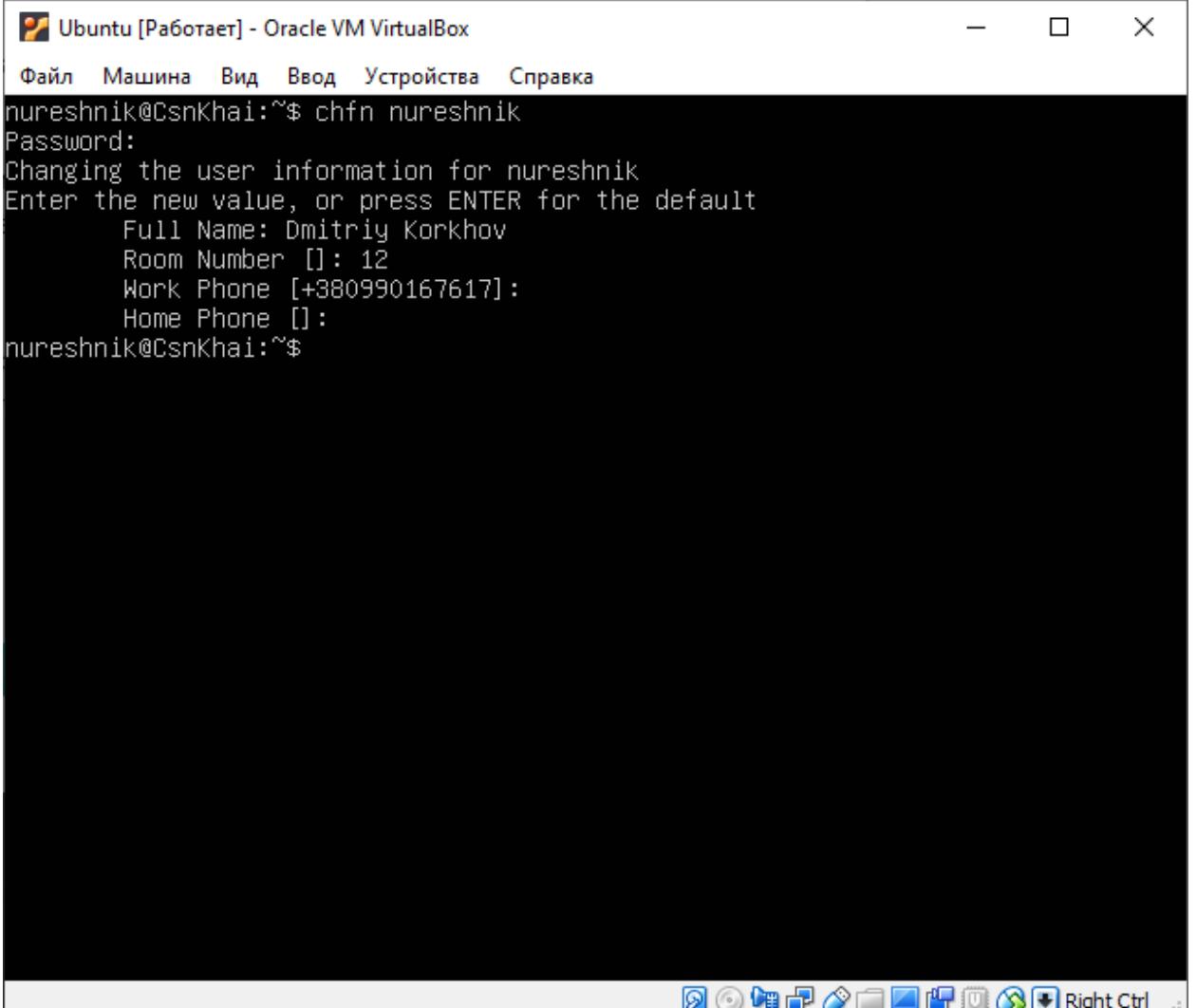


The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window contains the following text:

```
Файл  Машине  Вид  Ввод  Устройства  Справка
root@CsnKhai:/home/student# w
22:33:01 up 47 min, 1 user,  load average: 0.00, 0.01, 0.05
USER   TTY      FROM          LOGIN@    IDLE   JCPU   PCPU WHAT
student  tty1          21:46     2.00s  0.25s  0.10s -bash
root@CsnKhai:/home/student#
```

The terminal window has a standard Windows-style title bar and a taskbar at the bottom with various icons.

4) Change personal information about yourself.



The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window contains the following text:

```
nureshnik@CsnKhai:~$ chfn nureshnik
Password:
Changing the user information for nureshnik
Enter the new value, or press ENTER for the default
    Full Name: Dmitriy Korkhov
    Room Number []: 12
    Work Phone [+380990167617]:
    Home Phone []:
nureshnik@CsnKhai:~$
```

The terminal window has a standard Windows-style title bar and a taskbar at the bottom with various icons.

5) Become familiar with the Linux help system and the man and info commands. Get help on the previously discussed commands, define and describe any two keys for these commands. Give examples.

Ubuntu [Работает] - Oracle VM VirtualBox

Файл Машина Вид Ввод Устройства Справка

File: \*manpages\*, Node: passwd, Up: (dir)

PASSWD(1) User Commands PASSWD(1)

**NAME**

passwd - change user password

**SYNOPSIS**

passwd [options] [LOGIN]

**DESCRIPTION**

The passwd command changes passwords for user accounts. A normal user may only change the password for his/her own account, while the superuser may change the password for any account. passwd also changes the account or associated password validity period.

**Password Changes**

The user is first prompted for his/her old password, if one is present. This password is then encrypted and compared against the stored password. The user has only one chance to enter the correct password. The superuser is permitted to bypass this step so that forgotten passwords may be changed.

After the password has been entered, password aging information is checked to see if the user is permitted to change the password at this time. If not, passwd refuses to change the password and exits.

-----Info: (\*manpages\*)passwd, 325 lines --Top-----

Welcome to Info version 5.2. Type h for help, m for menu item.

Right Ctrl

Ubuntu [Работает] - Oracle VM VirtualBox

Файл Машина Вид Ввод Устройства Справка

**OPTIONS**

The options which apply to the chfn command are:

-f, --full-name **FULL\_NAME**  
Change the user's full name.

-h, --home-phone **HOME\_PHONE**  
Change the user's home phone number.

-o, --other **OTHER**  
Change the user's other GECOS information. This field is used to store accounting information used by other applications, and can be changed only by a superuser.

-r, --room **ROOM\_NUMBER**  
Change the user's room number.

-R, --root **CHROOT\_DIR**  
Apply changes in the **CHROOT\_DIR** directory and use the configuration files from the **CHROOT\_DIR** directory.

-u, --help  
Display help message and exit.

-w, --work-phone **WORK\_PHONE**  
Change the user's office phone number.

If none of the options are selected, chfn operates in an interactive fashion, prompting the user with the current values for all of the

Manual page chfn(1) line 28 (press h for help or q to quit)

Right Ctrl

6) Explore the more and less commands using the help system. View the contents of files .bash\* using commands.

The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window contains the following text:

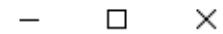
```
[ Wrote 5 lines ]  
root@CsnKhai:/home/student# cat Task1.txt  
Hi!  
It's a second line  
Oh! It's a third line!  
Thanks for attention:)  
  
root@CsnKhai:/home/student# nl Task.txt  
nl: Task.txt: No such file or directory  
root@CsnKhai:/home/student# nl Task1.txt  
1 Hi!  
2 It's a second line  
3 Oh! It's a third line!  
4 Thanks for attention:)  
  
root@CsnKhai:/home/student# less Task1.txt  
Hi!  
It's a second line  
Oh! It's a third line!  
Thanks for attention:)  
  
root@CsnKhai:/home/student# head -n2 Task1.txt  
Hi!  
It's a second line  
root@CsnKhai:/home/student#
```

The terminal window has a standard Windows-style title bar and a toolbar at the bottom with icons for copy, paste, cut, and other functions. The text area is black with white text, and the command prompt is in blue.

7) Describe in plans that you are working on laboratory work 1. Tip: You should read the documentation for the finger command.



Ubuntu [Работает] - Oracle VM VirtualBox

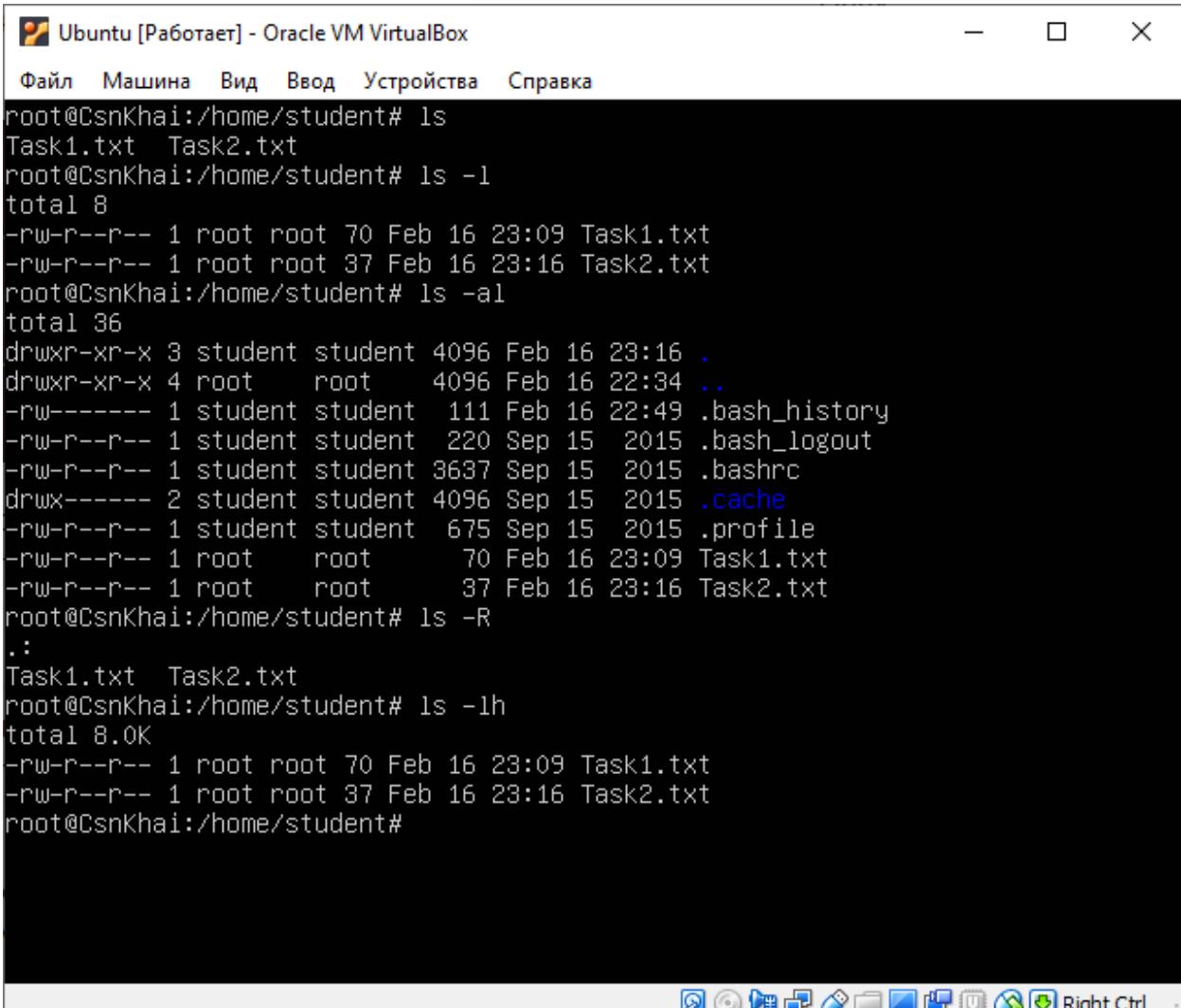


Файл Машина Вид Ввод Устройства Справка

```
root@CsnKhai:/home/student# finger student
Login: student                                Name: Student KhAI
Directory: /home/student                         Shell: /bin/bash
On since Wed Feb 16 22:54 (UTC) on tty1   6 seconds idle
      (messages off)
No mail.
No Plan.
root@CsnKhai:/home/student# finger nureshnik
Login: nureshnik                               Name: Dmitriy Korkhov
Directory: /home/nureshnik                      Shell: /bin/bash
Office: 12, +380990167617
Last login Wed Feb 16 22:49 (UTC) on tty1
No mail.
No Plan.
root@CsnKhai:/home/student# _
```



8) List the contents of the home directory using the ls command, define its files and directories. Hint: Use the help system to familiarize yourself with the ls command



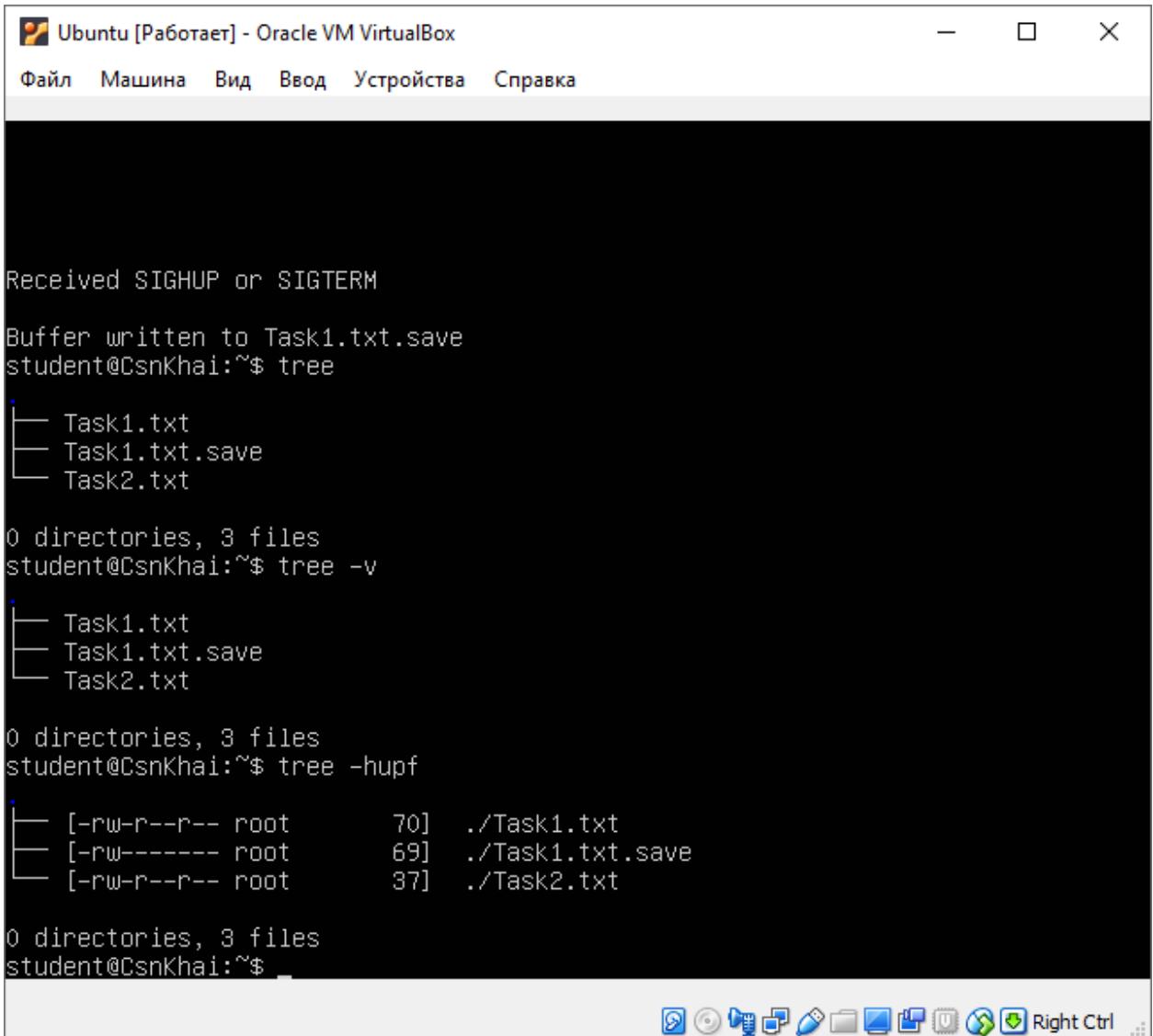
The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window contains the following terminal session:

```
Файл  Машине  Вид  Ввод  Устройства  Справка
root@CsnKhai:/home/student# ls
Task1.txt  Task2.txt
root@CsnKhai:/home/student# ls -l
total 8
-rw-r--r-- 1 root root 70 Feb 16 23:09 Task1.txt
-rw-r--r-- 1 root root 37 Feb 16 23:16 Task2.txt
root@CsnKhai:/home/student# ls -al
total 36
drwxr-xr-x 3 student student 4096 Feb 16 23:16 .
drwxr-xr-x 4 root    root    4096 Feb 16 22:34 ..
-rw------- 1 student student 111 Feb 16 22:49 .bash_history
-rw-r--r-- 1 student student 220 Sep 15 2015 .bash_logout
-rw-r--r-- 1 student student 3637 Sep 15 2015 .bashrc
drwx----- 2 student student 4096 Sep 15 2015 .cache
-rw-r--r-- 1 student student  675 Sep 15 2015 .profile
-rw-r--r-- 1 root    root    70 Feb 16 23:09 Task1.txt
-rw-r--r-- 1 root    root    37 Feb 16 23:16 Task2.txt
root@CsnKhai:/home/student# ls -R
.:
Task1.txt  Task2.txt
root@CsnKhai:/home/student# ls -lh
total 8.0K
-rw-r--r-- 1 root root 70 Feb 16 23:09 Task1.txt
-rw-r--r-- 1 root root 37 Feb 16 23:16 Task2.txt
root@CsnKhai:/home/student#
```

The terminal window has a standard Linux-style menu bar at the top. Below the menu is a toolbar with various icons, including a magnifying glass, a folder, a file, and a terminal. The bottom of the window features a status bar with the text "Right Ctrl" and some other unidentifiable symbols.

## Task 1 (Part 2)

1) Examine the tree command. Master the technique of applying a template, for example, display all files that contain a character c, or files that contain a specific sequence of characters. List subdirectories of the root directory up to and including the second nesting level.



```
Ubuntu [Работает] - Oracle VM VirtualBox
Файл  Машина  Вид  Ввод  Устройства  Справка

Received SIGHUP or SIGTERM
Buffer written to Task1.txt.save
student@CsnKhai:~$ tree
.
├── Task1.txt
├── Task1.txt.save
└── Task2.txt

0 directories, 3 files
student@CsnKhai:~$ tree -v
.
├── Task1.txt
├── Task1.txt.save
└── Task2.txt

0 directories, 3 files
student@CsnKhai:~$ tree -hupf
.
├── [-rw-r--r-- root      70] ./Task1.txt
├── [-rw----- root      69] ./Task1.txt.save
└── [-rw-r--r-- root      37] ./Task2.txt

0 directories, 3 files
student@CsnKhai:~$
```

2) What command can be used to determine the type of file (for example, text or binary)? Give an example.

The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window has a menu bar with Russian labels: Файл (File), Машина (Machine), Вид (View), Ввод (Input), Устройства (Devices), and Справка (Help). The main area of the terminal displays the following command-line output:

```
student@CsnKhai:~$ file *
Task1.txt:      ASCII text
Task1.txt.save: regular file, no read permission
Task2.txt:      ASCII text
student@CsnKhai:~$
```

The bottom of the terminal window features a toolbar with various icons, including a magnifying glass, a folder, a file, a clipboard, and a network icon. To the right of the icons, the text "Right Ctrl" is visible.

3) Master the skills of navigating the file system using relative and absolute paths. How can you go back to your home directory from anywhere in the filesystem?

The mkdir command is used to create folders, the cd command (folder name) is used to navigate between folders. To go to the root directory, you need to use the cd command without arguments.

Ubuntu [Работает] - Oracle VM VirtualBox

Файл Машина Вид Ввод Устройства Справка

```
student@CsnKhai:~$ file *
Task1.txt:      ASCII text
Task1.txt.save: regular file, no read permission
Task2.txt:      ASCII text
student@CsnKhai:~$ mkdir Edu
student@CsnKhai:~$ cd Edu
student@CsnKhai:~/Edu$ mkdir Tasks
student@CsnKhai:~/Edu$ cd home
-bash: cd: home: No such file or directory
student@CsnKhai:~/Edu$ cd
student@CsnKhai:~$ _
```

- 4) Become familiar with the various options for the ls command. Give examples of listing directories using different keys. Explain the information displayed on the terminal using the -l and -a switches.

```
student@CsnKhai:~$ ls -l
total 16
drwxrwxr-x 3 student student 4096 Feb 16 23:44 Edu
-rw-r--r-- 1 root      root      70 Feb 16 23:09 Task1.txt
-rw----- 1 root      root      69 Feb 16 23:39 Task1.txt.save
-rw-r--r-- 1 root      root      37 Feb 16 23:16 Task2.txt
student@CsnKhai:~$ ls -a
.  .bash_history  .bashrc  Edu      Task1.txt      Task2.txt
..  .bash_logout   .cache   .profile Task1.txt.save
student@CsnKhai:~$ _
```

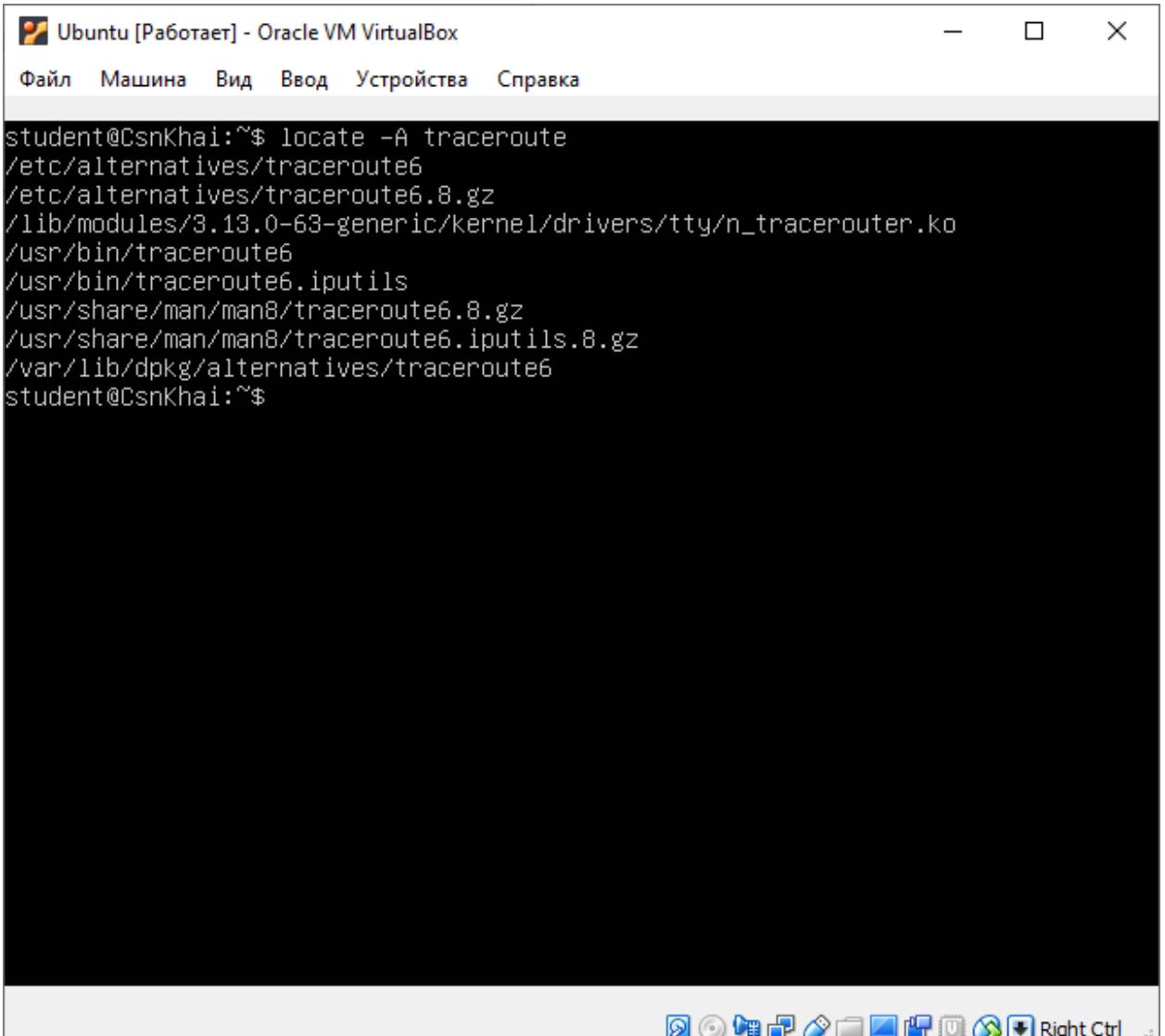
Using the `ls -l` command will display the main files, folders, and also: the first line will indicate the total number of blocks of disk space occupied by the files of the browsed directory. In the description of each file, the first character indicates the type of file object, followed by permissions (`rwxrwxrwx`). The second column contains a number indicating the number of hard links for the files. Next are the owner, group, size in bytes, last modified date, and file name.

Key A will show all files, including hidden ones.

5) ???

6) ???

7) Using the locate utility, find all files that contain the squid and traceroute sequence.



```
student@CsnKhai:~$ locate -A traceroute
/etc/alternatives/traceroute6
/etc/alternatives/traceroute6.8.gz
/lib/modules/3.13.0-63-generic/kernel/drivers/tty/n_tracerouter.ko
/usr/bin/traceroute6
/usr/bin/traceroute6.iputils
/usr/share/man/man8/traceroute6.8.gz
/usr/share/man/man8/traceroute6.iputils.8.gz
/var/lib/dpkg/alternatives/traceroute6
student@CsnKhai:~$
```

Ubuntu [Работает] - Oracle VM VirtualBox

Файл Машина Вид Ввод Устройства Справка

```
student@CsnKhai:~$ locate -A traceroute
/etc/alternatives/traceroute6
/etc/alternatives/traceroute6.8.gz
/lib/modules/3.13.0-63-generic/kernel/drivers/tty/n_tracerouter.ko
/usr/bin/traceroute6
/usr/bin/traceroute6.iputils
/usr/share/man/man8/traceroute6.8.gz
/usr/share/man/man8/traceroute6.iputils.8.gz
/var/lib/dpkg/alternatives/traceroute6
student@CsnKhai:~$ locate -A squid
student@CsnKhai:~$ _
```

8) Determine which partitions are mounted in the system, as well as the types of these partitions.

Ubuntu [Работает] - Oracle VM VirtualBox

Файл Машина Вид Ввод Устройства Справка

```
student@CsnKhai:~$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev              113860       4   113856   1% /dev
tmpfs             24780     388   24392   2% /run
/dev/sda1        1513328 1218092   200312  86% /
none                  4       0       4   0% /sys/fs/cgroup
none                 5120      0     5120   0% /run/lock
none                123896      0   123896   0% /run/shm
none                102400      0   102400   0% /run/user
student@CsnKhai:~$ lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda      8:0    0  1.5G  0 disk 
└─sda1   8:1    0  1.5G  0 part /
sr0     11:0    1 1024M  0 rom 
student@CsnKhai:~$
```

9) Count the number of lines containing a given sequence of characters in a given file. ??

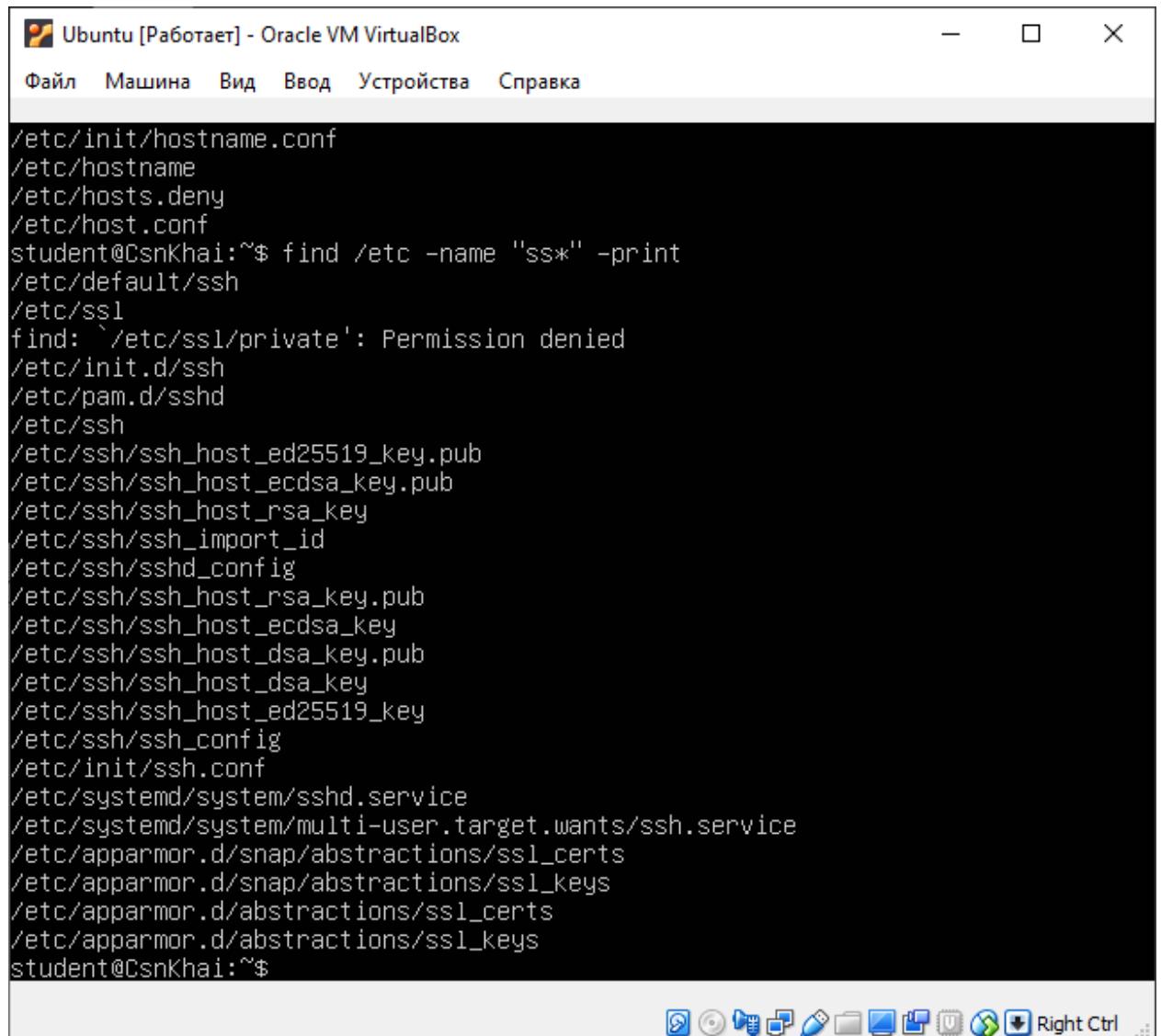
10) Using the find command, find all files in the /etc directory containing the host character sequence.

Файл Машина Вид Ввод Устройства Справка

```
student@CsnKhai:~$ find /etc -name "host*" -print
find: `/etc/ssl/private': Permission denied
/etc/hosts
/etc/hosts.allow
/etc/init/hostname.conf
/etc/hostname
/etc/hosts.deny
/etc/host.conf
student@CsnKhai:~$
```



11) List all objects in /etc that contain the ss character sequence. How can I duplicate a similar command using a bunch of grep?



```
Ubuntu [Работает] - Oracle VM VirtualBox
Файл  Машине  Вид  Ввод  Устройства  Справка

/etc/init/hostname.conf
/etc/hostname
/etc/hosts.deny
/etc/host.conf
student@CsnKhai:~$ find /etc -name "ss*" -print
/etc/default/ssh
/etc/ssl
find: `/etc/ssl/private': Permission denied
/etc/init.d/ssh
/etc/pam.d/sshd
/etc/ssh
/etc/ssh/ssh_host_ed25519_key.pub
/etc/ssh/ssh_host_ecdsa_key.pub
/etc/ssh/ssh_host_rsa_key
/etc/ssh/ssh_import_id
/etc/ssh/sshd_config
/etc/ssh/ssh_host_rsa_key.pub
/etc/ssh/ssh_host_ecdsa_key
/etc/ssh/ssh_host_dsa_key.pub
/etc/ssh/ssh_host_dsa_key
/etc/ssh/ssh_host_ed25519_key
/etc/ssh/ssh_config
/etc/init/ssh.conf
/etc/systemd/system/sshd.service
/etc/systemd/system/multi-user.target.wants/ssh.service
/etc/apparmor.d/snap/abstractions/ssl_certs
/etc/apparmor.d/snap/abstractions/ssl_keys
/etc/apparmor.d/abstractions/ssl_certs
/etc/apparmor.d/abstractions/ssl_keys
student@CsnKhai:~$
```

Finding ss sequences with grep requires a large number of operations, because if you just enter a match search, you will get a huge list of matches.

Ubuntu [Работает] - Oracle VM VirtualBox

Файл Машина Вид Ввод Устройства Справка

```
dd
/etc/mime.types:application/vnd.sun.xml.impress
xi
/etc/mime.types:application/vnd.sun.xml.impress.template
ti
/etc/mime.types:application/x-7z-compressed
/etc/mime.types:application/x-chess-pgn
/etc/mime.types:application/x-gtar-compressed
/etc/mime.types:#application/x-httplib-php3-preprocessed
/etc/mime.types:application/x-rss+xml
/etc/mime.types:chemical/x-compass
/etc/mime.types:chemical/x-crossfire
/etc/mime.types:chemical/x-gamess-input
/etc/mime.types:chemical/x-gaussian-checkpoint
/etc/mime.types:chemical/x-gaussian-cube
/etc/mime.types:chemical/x-gaussian-input
/etc/mime.types:chemical/x-gaussian-log
/etc/mime.types:chemical/x-swissprot
/etc/mime.types:message/delivery-status
/etc/mime.types:message/disposition-notification
/etc/mime.types:message/external-body
/etc/mime.types:message/http
/etc/mime.types:message/s-http
/etc/mime.types:message/news
/etc/mime.types:message/partial
/etc/mime.types:message/rfc822
/etc/mime.types:multipart/voice-message
/etc/mime.types:text/css
grep: /etc/shadow: Permission denied
student@CsnKhai:~$ grep -r ss /etc/
```



12) Organize a screen-by-screen print of the contents of the /etc directory.

Hint: You must use stream redirection operations.

Ubuntu [Работает] - Oracle VM VirtualBox

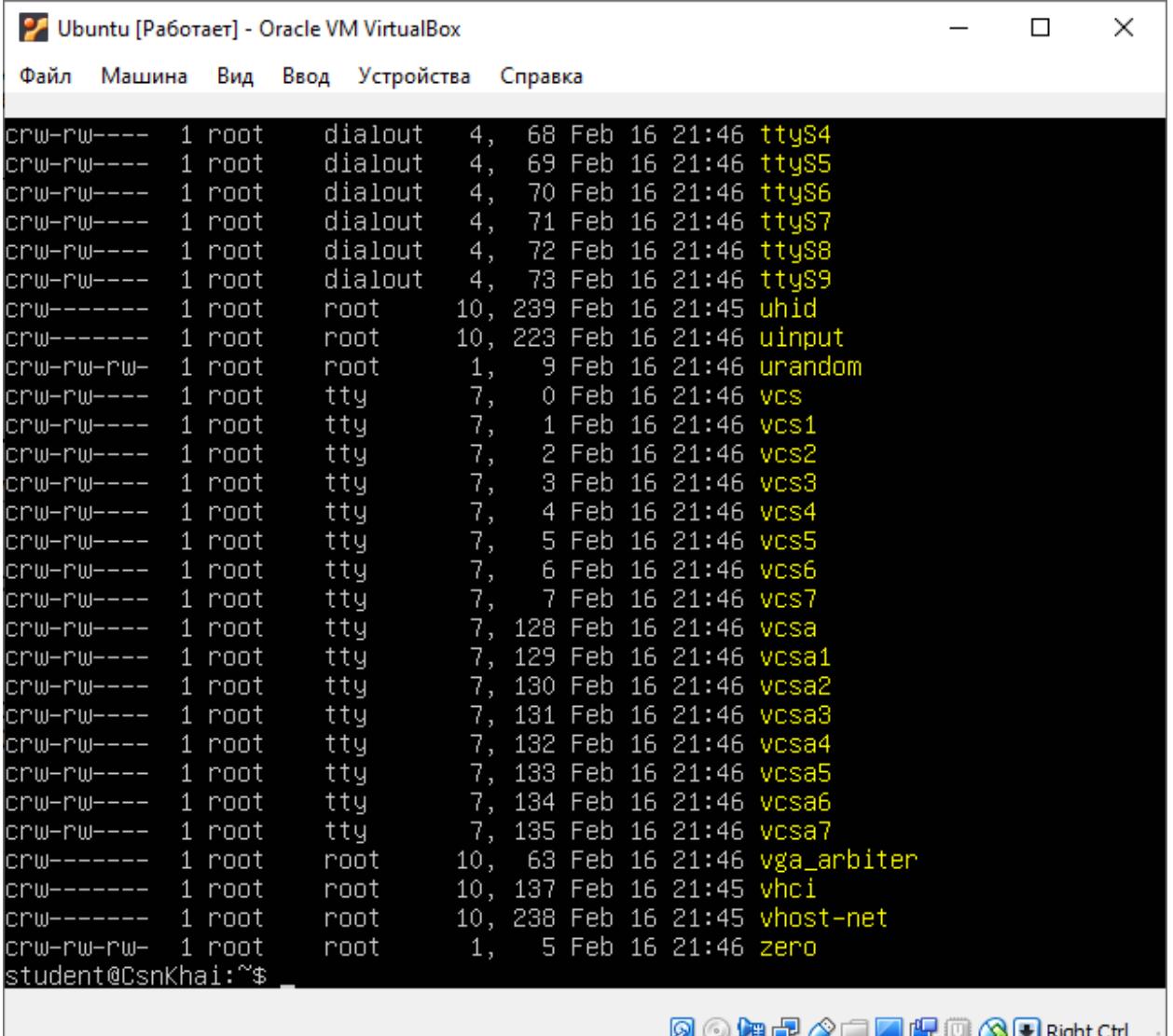
Файл Машина Вид Ввод Устройства Справка

```
student@CsnKhai:~$ tree /etc | less
```

13) What are the types of devices and how to determine the type of device? Give examples.

Character devices read and write data as a stream of bytes. This includes serial and parallel ports, tape drives, terminals, and sound cards.

Block devices read and write data in blocks of a fixed size. Unlike character devices, block devices provide random access to their data. An example is a hard drive.



The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window contains a list of files from the /dev directory, likely generated by the "ls -l" command. The files listed include various character devices such as dialout, uhid, uinput, urandom, vcs, vcs1, vcs2, vcs3, vcs4, vcs5, vcs6, vcs7, vcsa, vcsa1, vcsa2, vcsa3, vcsa4, vcsa5, vcsa6, vcsa7, vga\_arbiter, vhci, vhost-net, and zero. The terminal window has a standard Linux-style menu bar at the top and a toolbar with icons at the bottom.

```
crw-rw---- 1 root dialout 4, 68 Feb 16 21:46 ttyS4
crw-rw---- 1 root dialout 4, 69 Feb 16 21:46 ttyS5
crw-rw---- 1 root dialout 4, 70 Feb 16 21:46 ttyS6
crw-rw---- 1 root dialout 4, 71 Feb 16 21:46 ttyS7
crw-rw---- 1 root dialout 4, 72 Feb 16 21:46 ttyS8
crw-rw---- 1 root dialout 4, 73 Feb 16 21:46 ttyS9
crw----- 1 root root 10, 239 Feb 16 21:45 uhid
crw----- 1 root root 10, 223 Feb 16 21:46 uinput
crw-rw-rw- 1 root root 1, 9 Feb 16 21:46 urandom
crw-rw---- 1 root tty 7, 0 Feb 16 21:46 vcs
crw-rw---- 1 root tty 7, 1 Feb 16 21:46 vcs1
crw-rw---- 1 root tty 7, 2 Feb 16 21:46 vcs2
crw-rw---- 1 root tty 7, 3 Feb 16 21:46 vcs3
crw-rw---- 1 root tty 7, 4 Feb 16 21:46 vcs4
crw-rw---- 1 root tty 7, 5 Feb 16 21:46 vcs5
crw-rw---- 1 root tty 7, 6 Feb 16 21:46 vcs6
crw-rw---- 1 root tty 7, 7 Feb 16 21:46 vcs7
crw-rw---- 1 root tty 7, 128 Feb 16 21:46 vcsa
crw-rw---- 1 root tty 7, 129 Feb 16 21:46 vcsa1
crw-rw---- 1 root tty 7, 130 Feb 16 21:46 vcsa2
crw-rw---- 1 root tty 7, 131 Feb 16 21:46 vcsa3
crw-rw---- 1 root tty 7, 132 Feb 16 21:46 vcsa4
crw-rw---- 1 root tty 7, 133 Feb 16 21:46 vcsa5
crw-rw---- 1 root tty 7, 134 Feb 16 21:46 vcsa6
crw-rw---- 1 root tty 7, 135 Feb 16 21:46 vcsa7
crw----- 1 root root 10, 63 Feb 16 21:46 vga_arbiter
crw----- 1 root root 10, 137 Feb 16 21:45 vhci
crw----- 1 root root 10, 238 Feb 16 21:45 vhost-net
crw-rw-rw- 1 root root 1, 5 Feb 16 21:46 zero
student@CsnKhai:~$
```

14) How to determine the type of file in the system, what types of files are there

Files in the Linux environment can be divided into three main types:

Regular files to store information

Special files - for devices and tunnels

Directories

Ubuntu [Работает] - Oracle VM VirtualBox

Файл Машина Вид Ввод Устройства Справка

```
student@CsnKhai:~$ file /bin/tar
/bin/tar: ELF 32-bit LSB executable, Intel 80386, version 1 (SYSV), dynamically
linked (uses shared libs), for GNU/Linux 2.6.24, BuildID[sha1]=37a4d72f10325a49
65800f5d03965af346f6c401, stripped
student@CsnKhai:~$ _
```

- 15) List the first 5 directory files that were recently accessed in the /etc directory.

Файл Машина Вид Ввод Устройства Справка

```
student@CsnKhai:~$ ls -ltr
total 24
-rw-r--r-- 1 root      root      70 Feb 16 23:09 Task1.txt
-rw-r--r-- 1 root      root      37 Feb 16 23:16 Task2.txt
-rw----- 1 root      root      69 Feb 16 23:39 Task1.txt.save
drwxrwxr-x 3 student   student  4096 Feb 16 23:44 Edu
drwxrwxr-x 2 student   student  4096 Feb 17 00:10 catalog
drwxrwxr-x 2 student   student  4096 Feb 17 00:40 New
student@CsnKhai:~$ _
```

