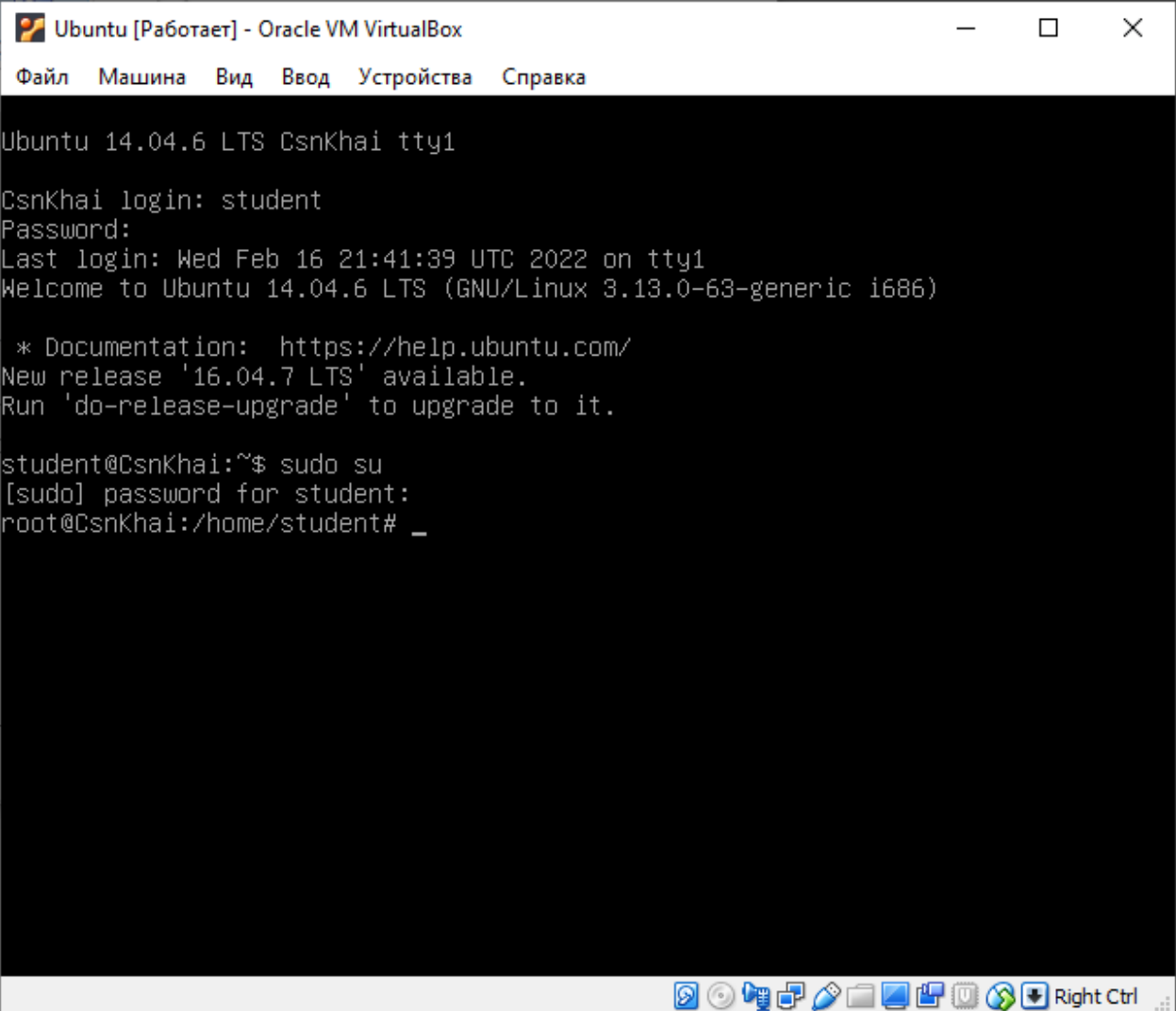


Task1 (Part1)

1) Log in to the system as root.



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

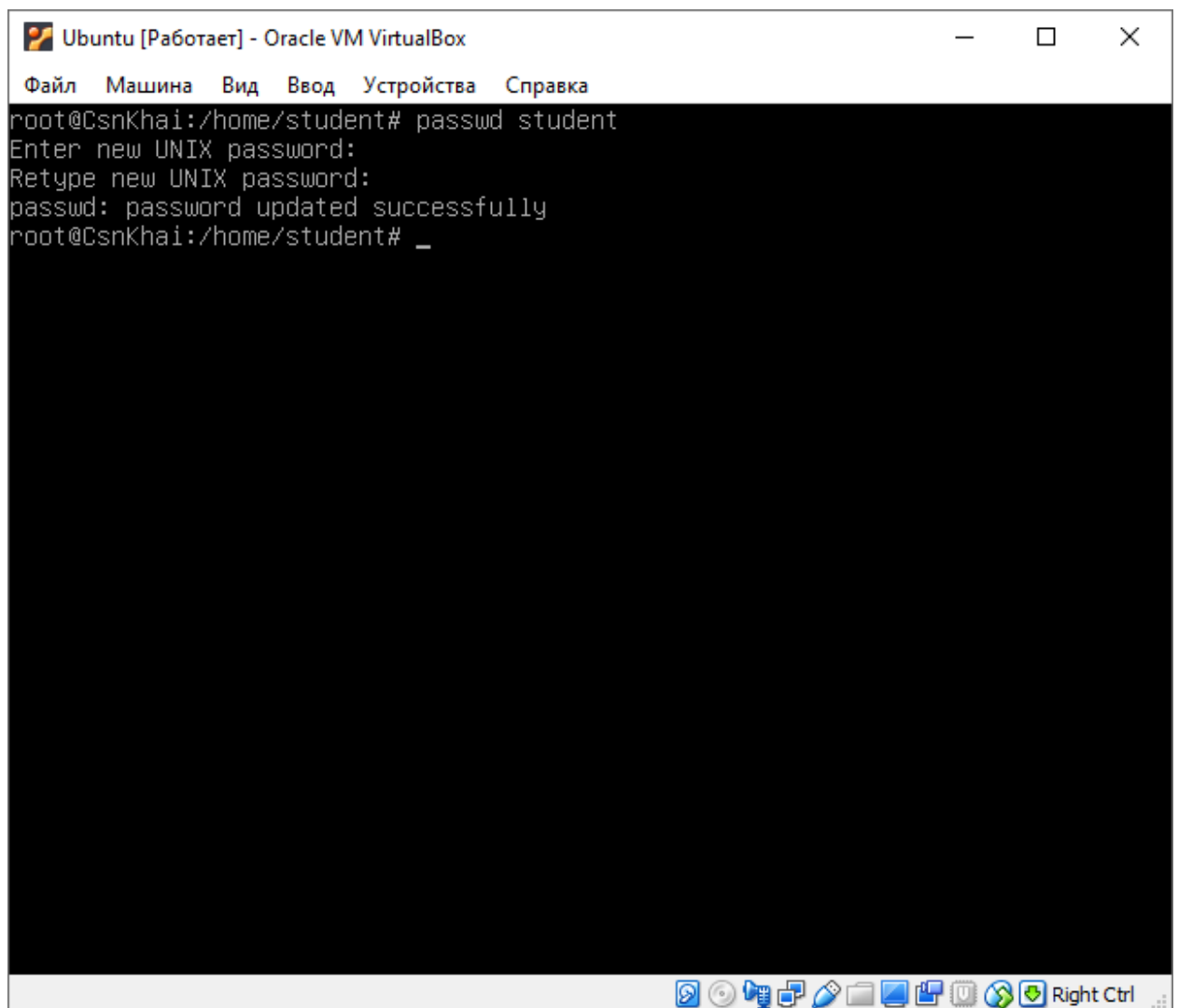
Ubuntu 14.04.6 LTS CsnKhai tty1

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# _
```

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 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:

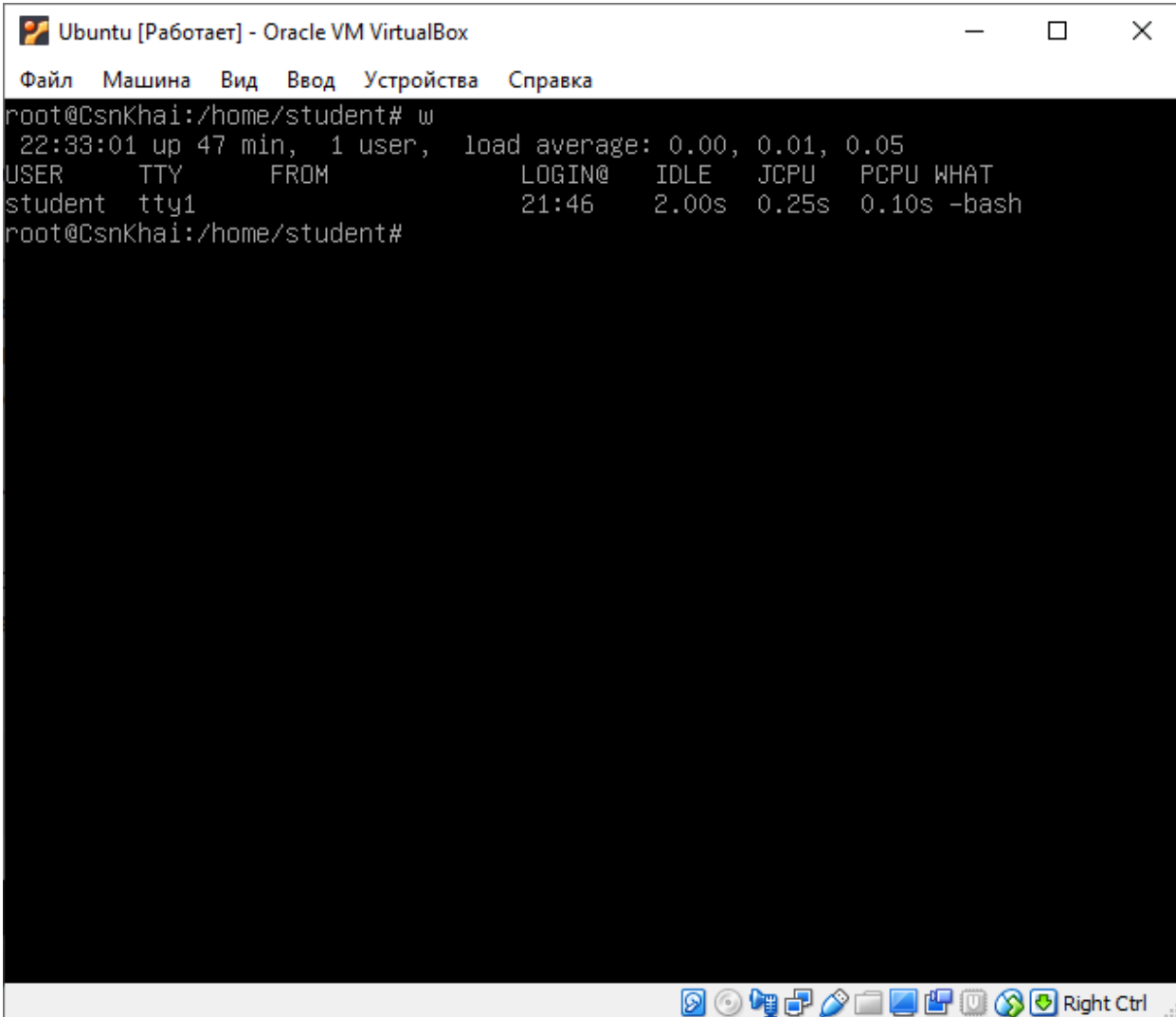
```
Options:
  -a, --all                report password status on all accounts
  -d, --delete             delete the password for the named account
  -e, --expire             force expire the password for the named account
  -h, --help              display this help message and exit
  -k, --keep-tokens        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
                           change password in REPOSITORY repository
  -R, --root CHROOT_DIR   directory to chroot into
  -S, --status             report password status on the named account
  -u, --unlock             unlock the password of the named account
  -w, --warndays WARN_DAYS set expiration warning days to WARN_DAYS
  -x, --maxdays MAX_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

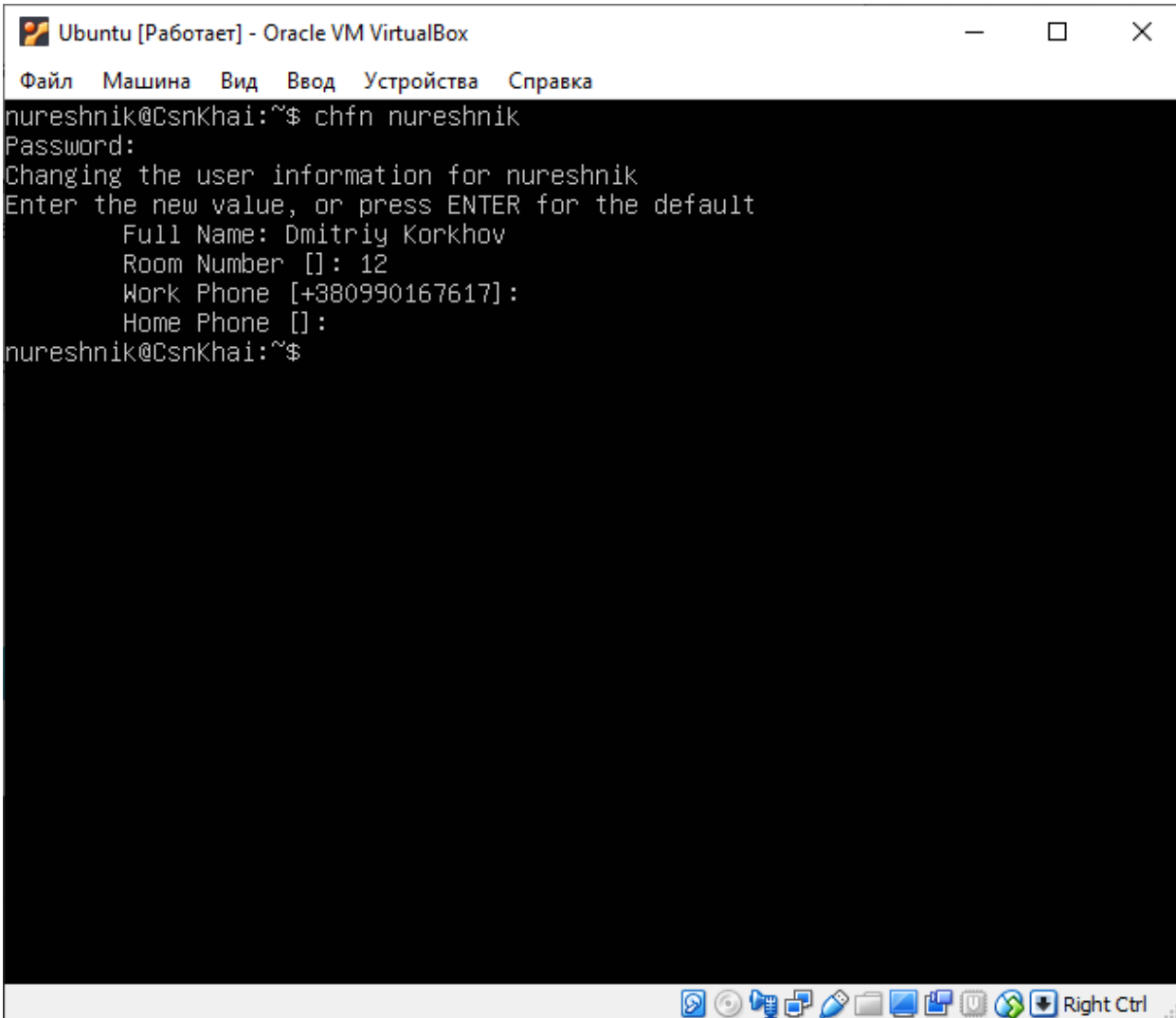


The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The terminal output is as follows:

```
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 menu bar with the following items: Файл, Машина, Вид, Ввод, Устройства, Справка. At the bottom of the window, there is a taskbar with various icons and a "Right Ctrl" button.

4) Change personal information about yourself.



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

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.
```

```
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.

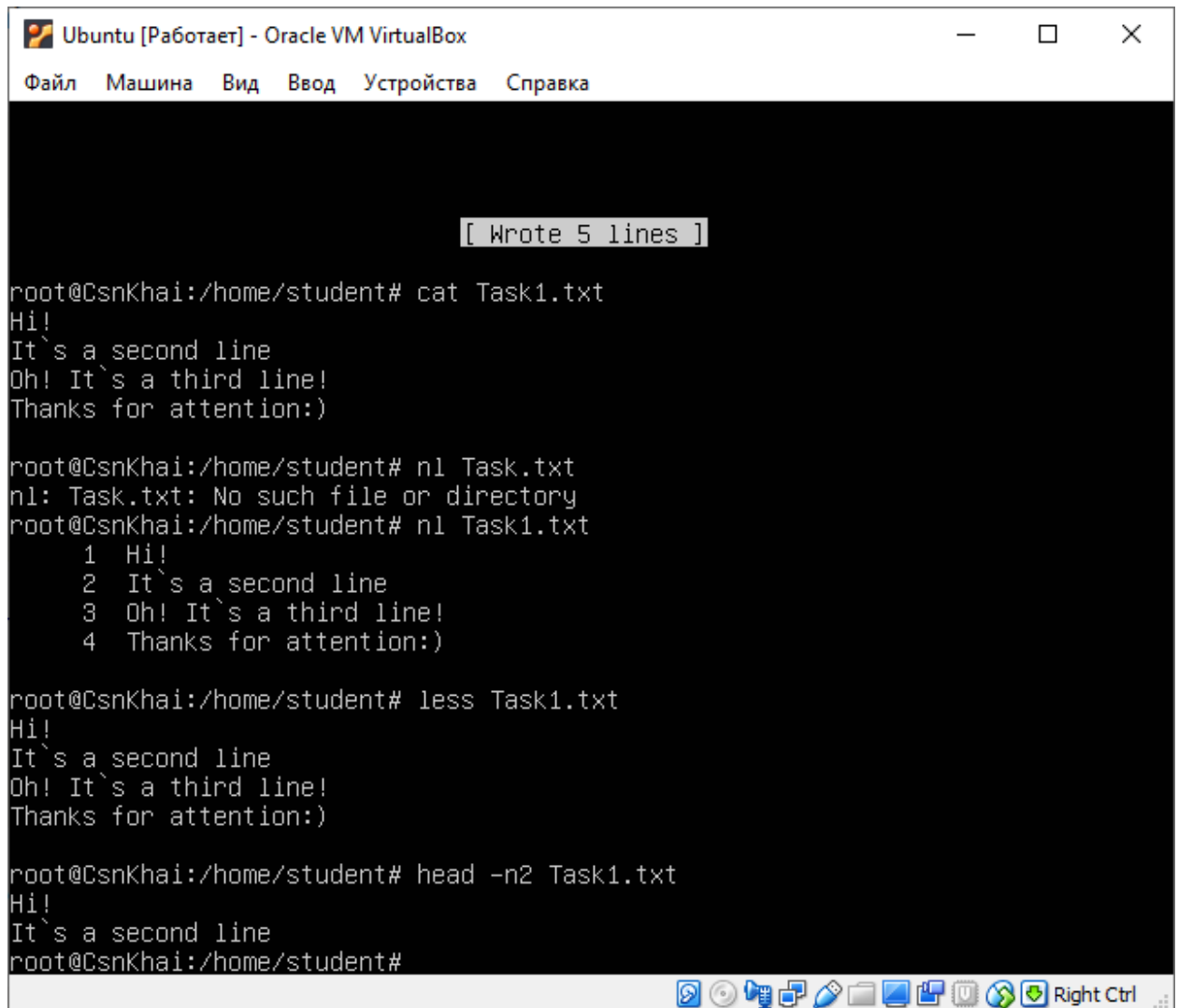
    -u, --help
        Display help message and exit.

    -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)
```

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



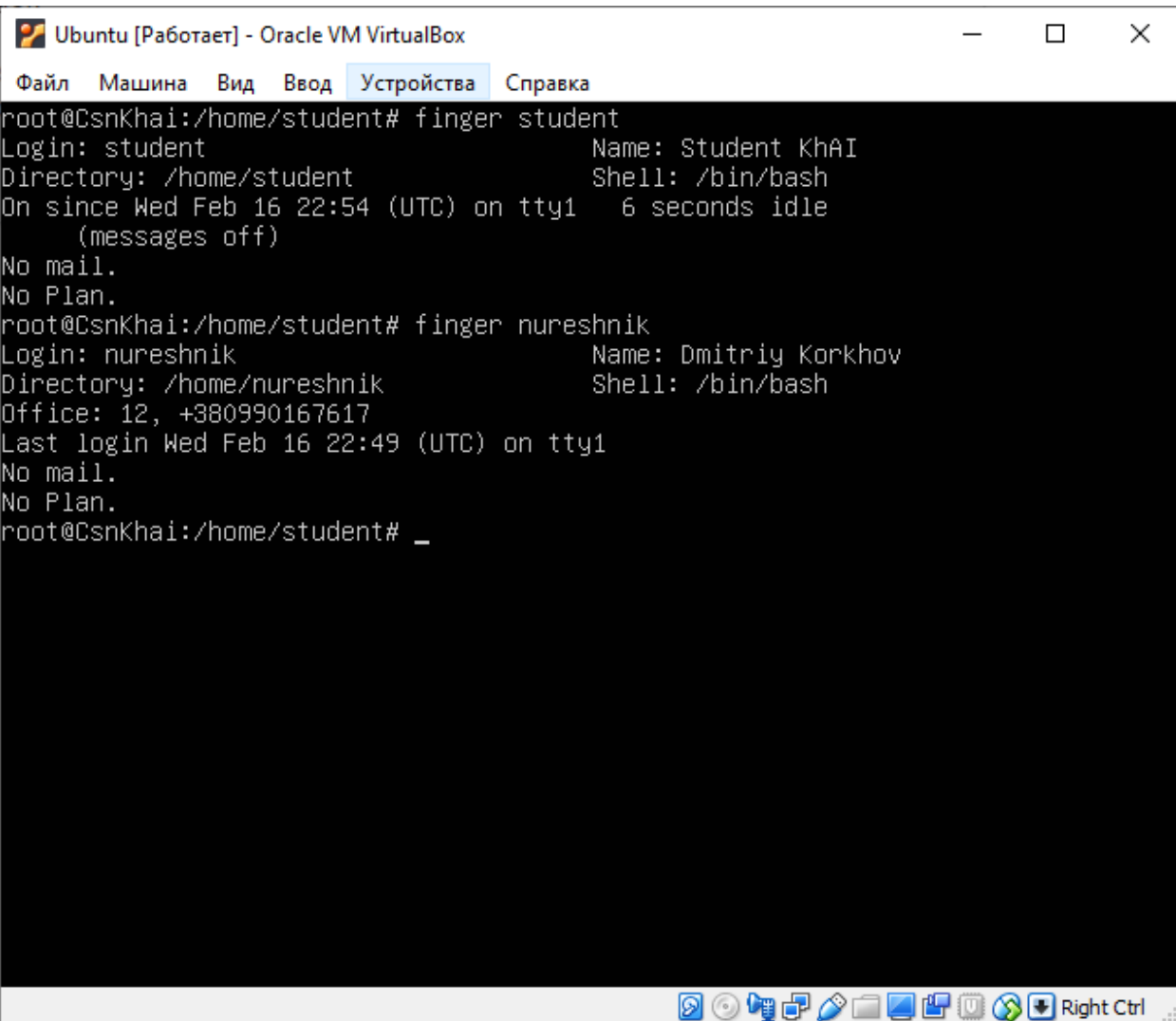
```
root@CsnKhai:/home/student# cat Task1.txt
Hi!
It`s a second line
Oh! It`s a third line!
Thanks for attention:)

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:)

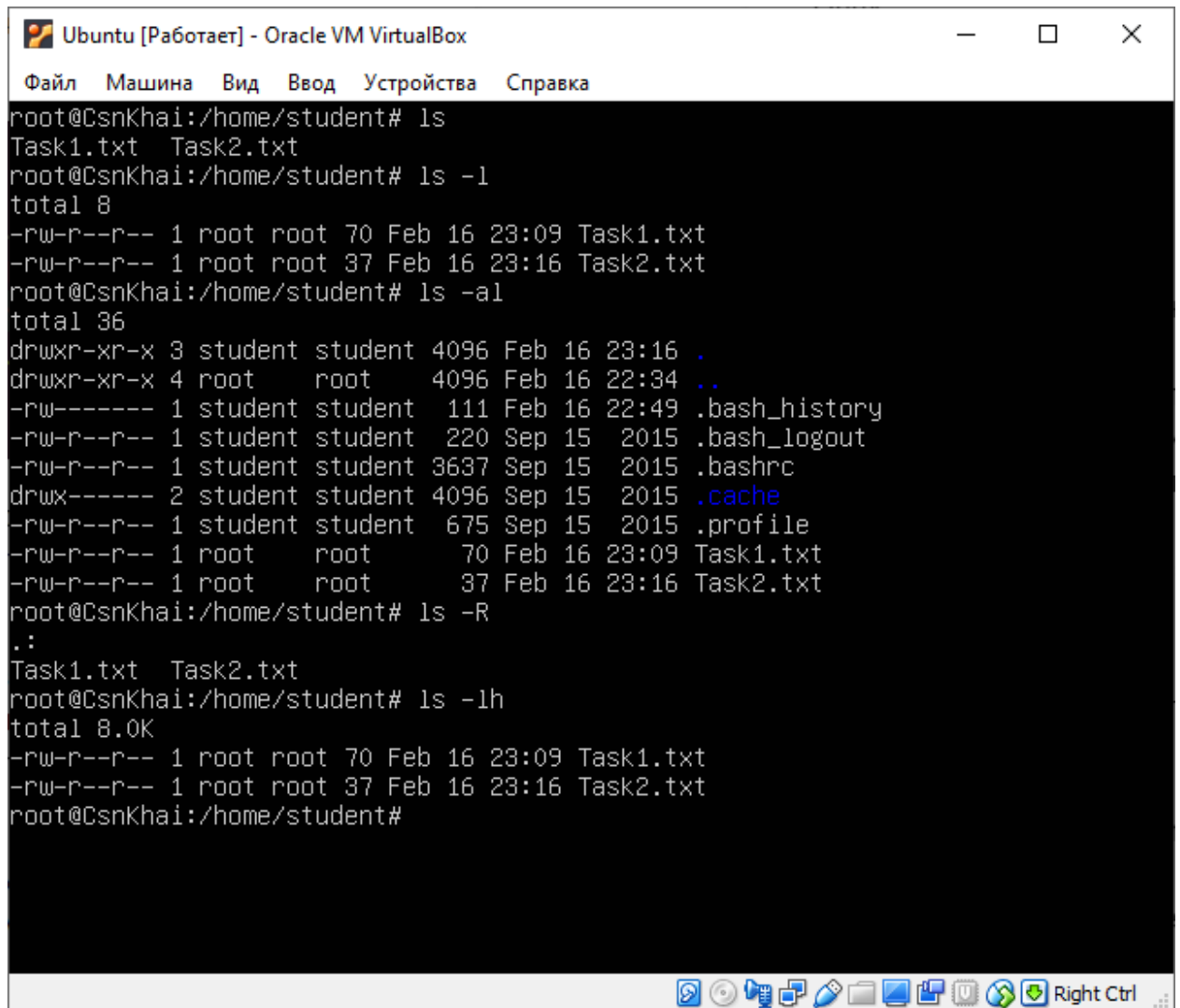
root@CsnKhai:/home/student# less Task1.txt
Hi!
It`s a second line
Oh! It`s a third line!
Thanks for attention:)

root@CsnKhai:/home/student# head -n2 Task1.txt
Hi!
It`s a second line
root@CsnKhai:/home/student#
```

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



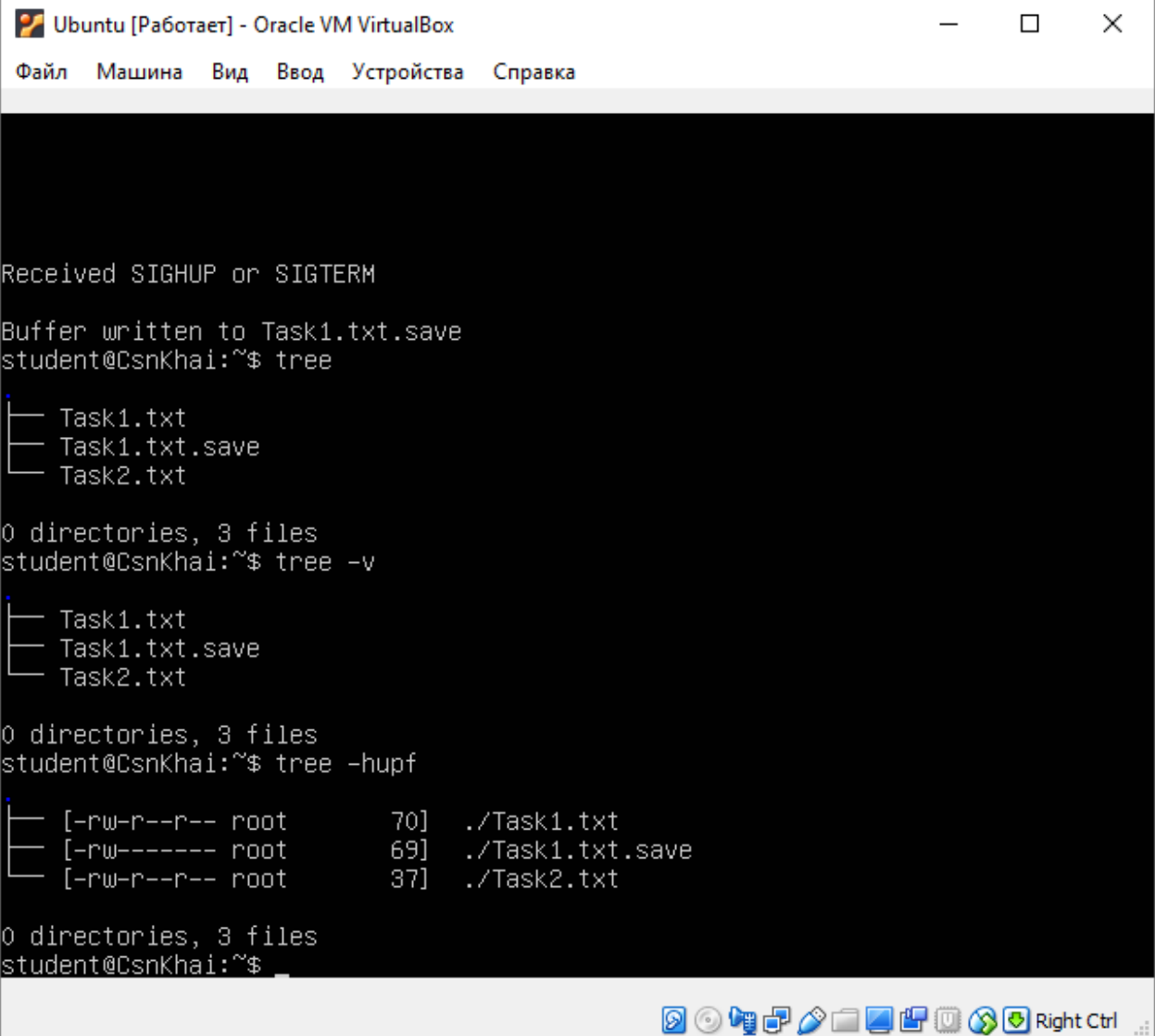
8) List the contents of the home directory using the ls command, define its files and directories. Hint: Use the help system to familiarize yourself with the ls command



```
Ubuntu [Работает] - Oracle VM VirtualBox
Файл  Машина  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#
```

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.



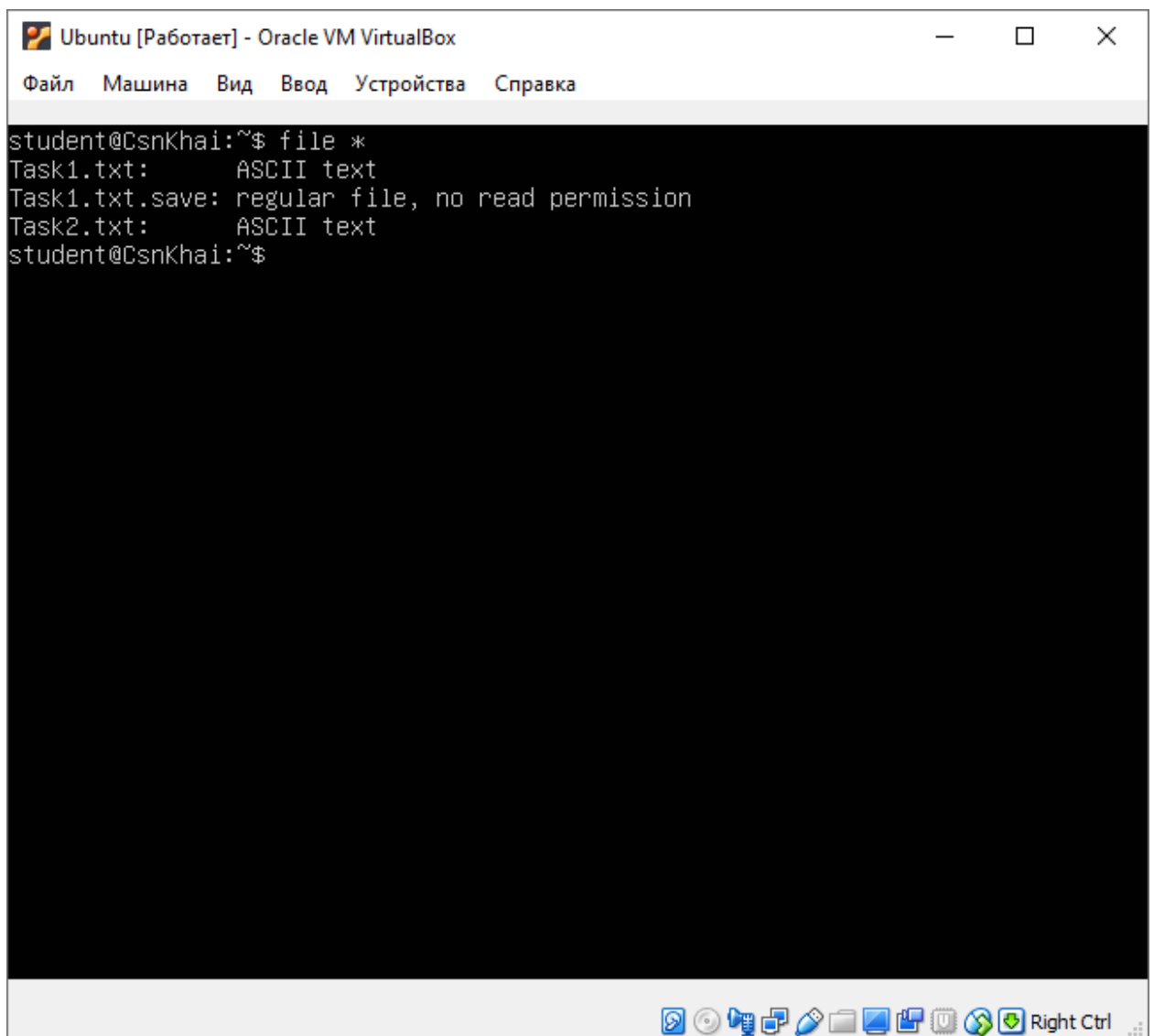
```
Received SIGHUP or SIGTERM
Buffer written to Task1.txt.save
student@CsnKhai:~$ tree
.
├── Task1.txt
├── Task1.txt.save
└── Task2.txt

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.



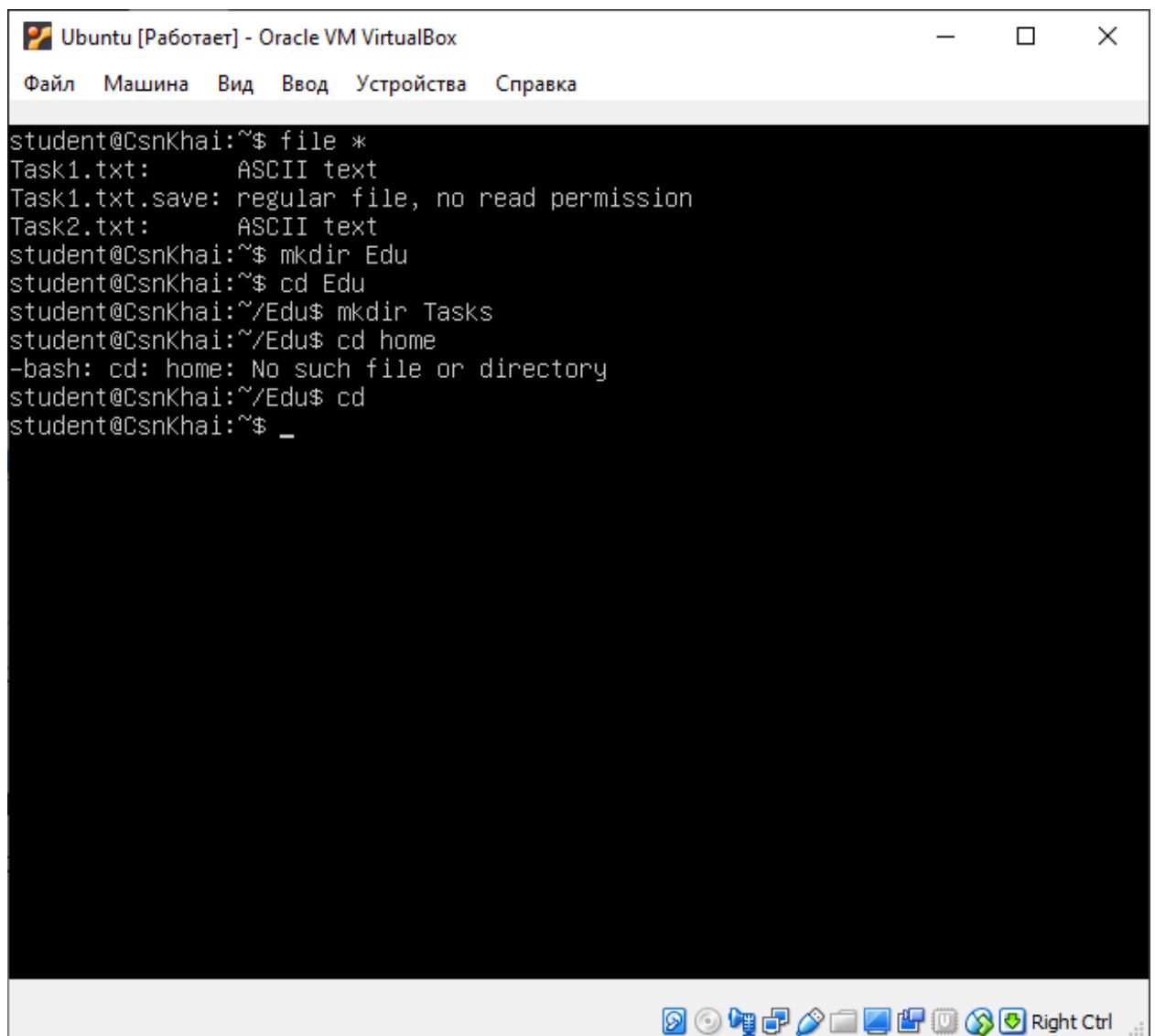
The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window has a menu bar with options: "Файл", "Машина", "Вид", "Ввод", "Устройства", and "Справка". The terminal output is as follows:

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

The terminal window has a taskbar at the bottom with various icons and a "Right Ctrl" button.

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.

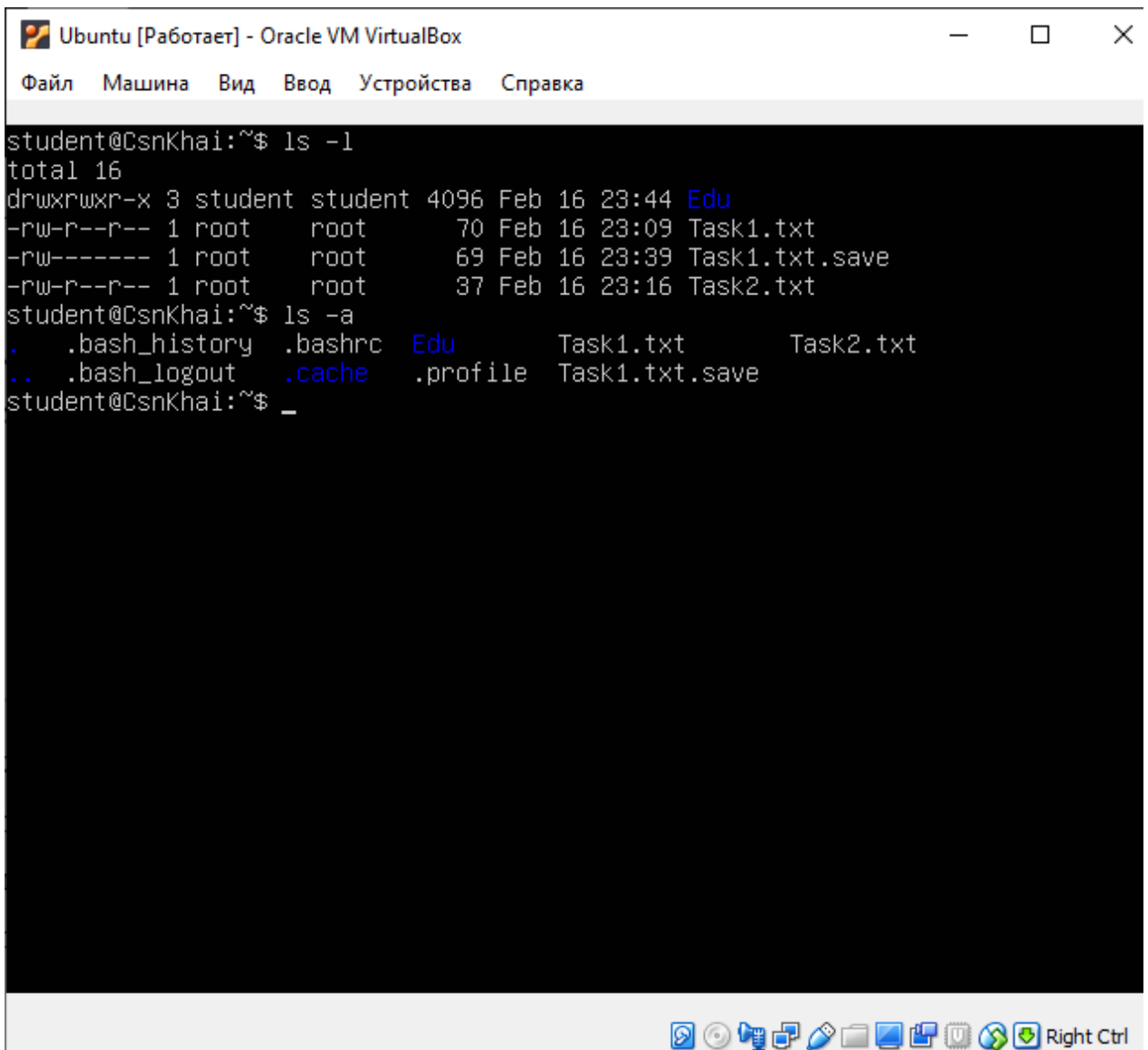


The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window has a menu bar with options: "Файл", "Машина", "Вид", "Ввод", "Устройства", and "Справка". The terminal output is as follows:

```
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:~$ _
```

The terminal window has a taskbar at the bottom with various icons and a "Right Ctrl" button.

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.



The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The menu bar includes "Файл", "Машина", "Вид", "Ввод", "Устройства", and "Справка". The terminal output is as follows:

```
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:~$ _
```

The terminal window has a taskbar at the bottom with various icons and a "Right Ctrl" button.

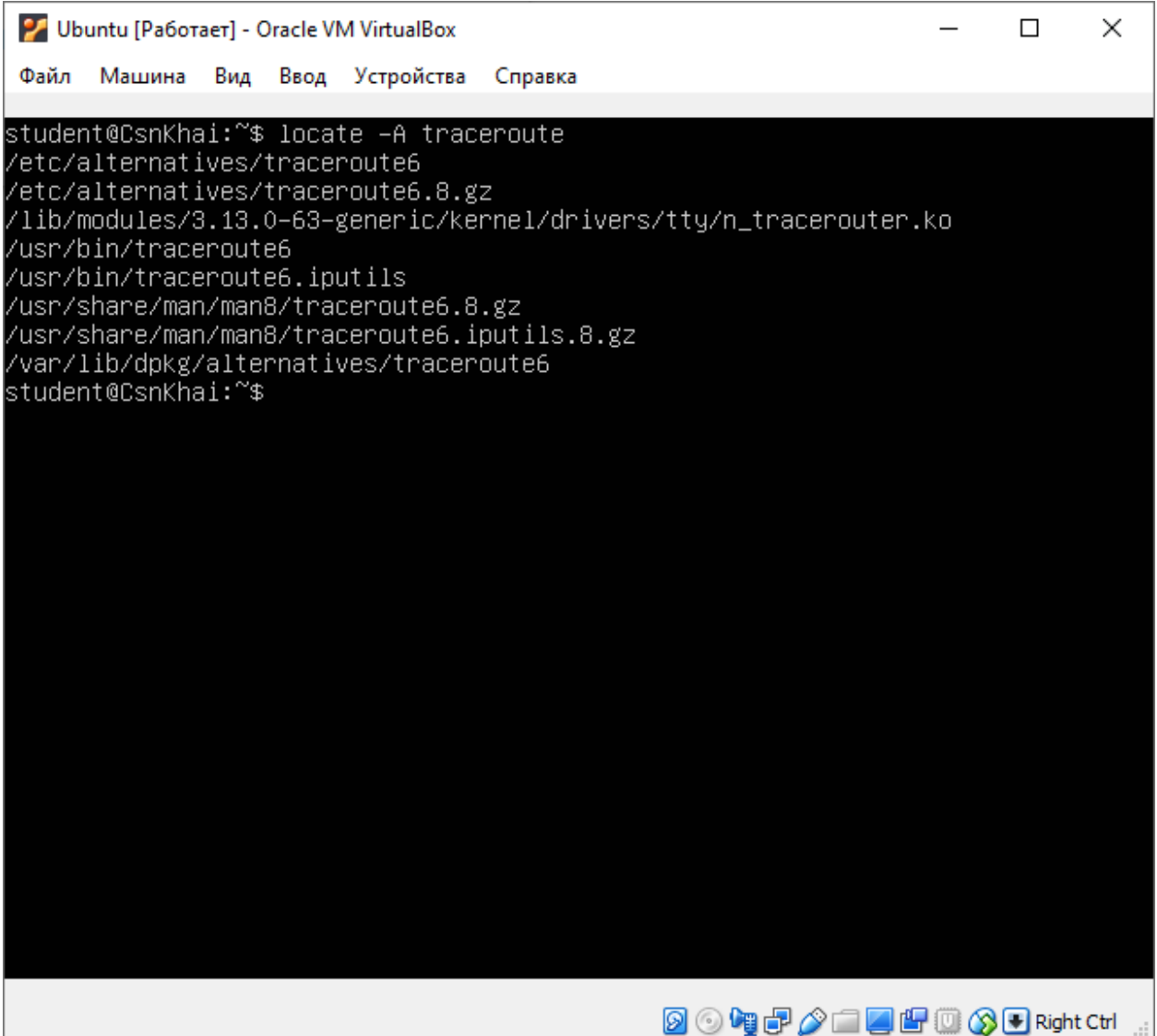
Using the `ls -l` command will display the main files, folders, and also: the first line will indicate the total number of blocks of disk space occupied by the files of the browsed directory. In the description of each file, the first character indicates the type of file object, followed by permissions (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) ???

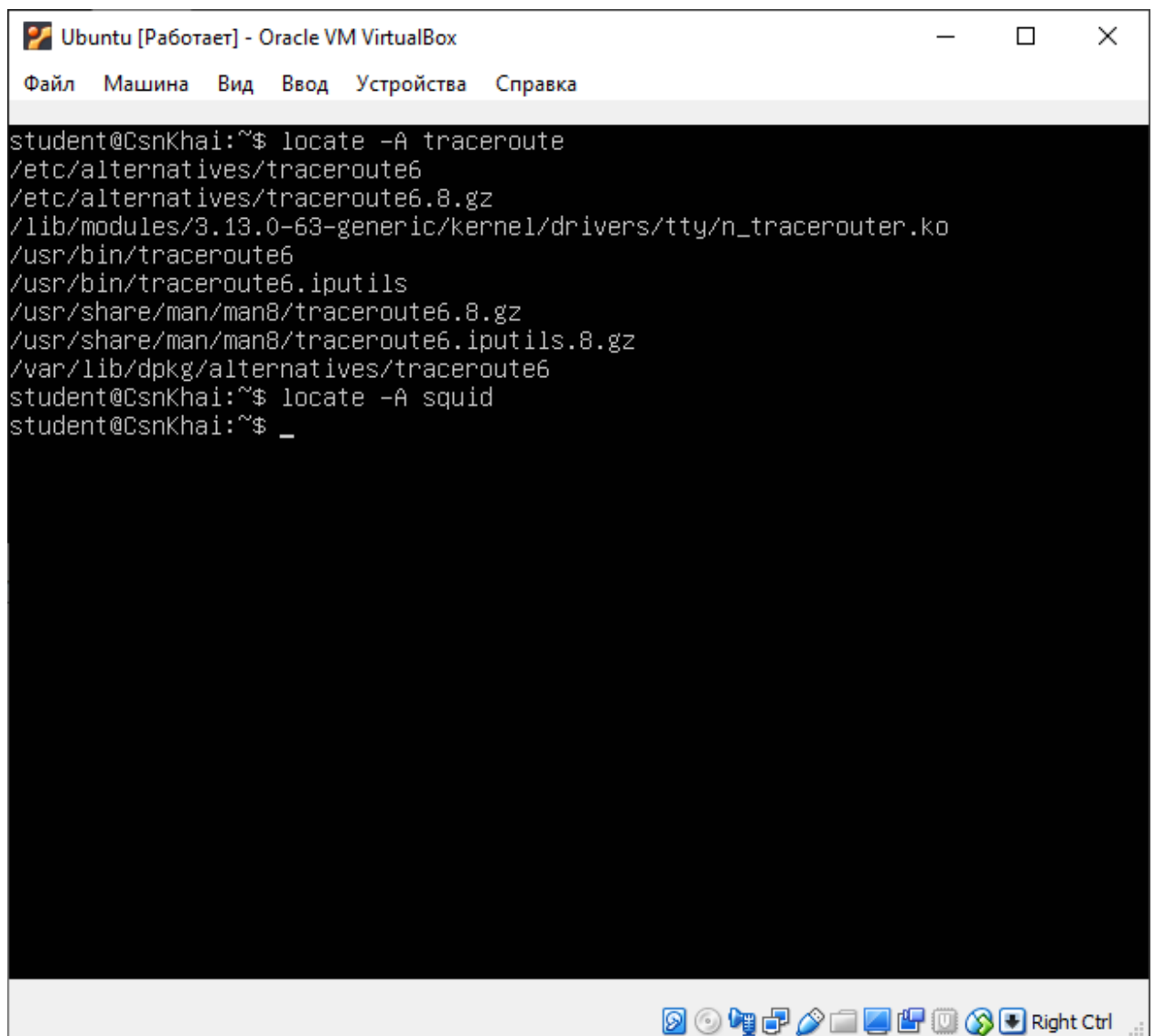
6) ???

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:~$
```

The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The terminal displays the command `locate -A traceroute` and its output, which lists several files related to traceroute. The output includes paths like `/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`, and `/var/lib/dpkg/alternatives/traceroute6`. The prompt `student@CsnKhai:~$` is shown at the end of the output. The terminal window has a menu bar with options: "Файл", "Машина", "Вид", "Ввод", "Устройства", and "Справка". The bottom of the window shows a taskbar with various icons and a "Right Ctrl" button.



The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window has a menu bar with options: "Файл", "Машина", "Вид", "Ввод", "Устройства", and "Справка". The terminal output is as follows:

```
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:~$ _
```

The terminal window has a taskbar at the bottom with various icons and a "Right Ctrl" button.

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

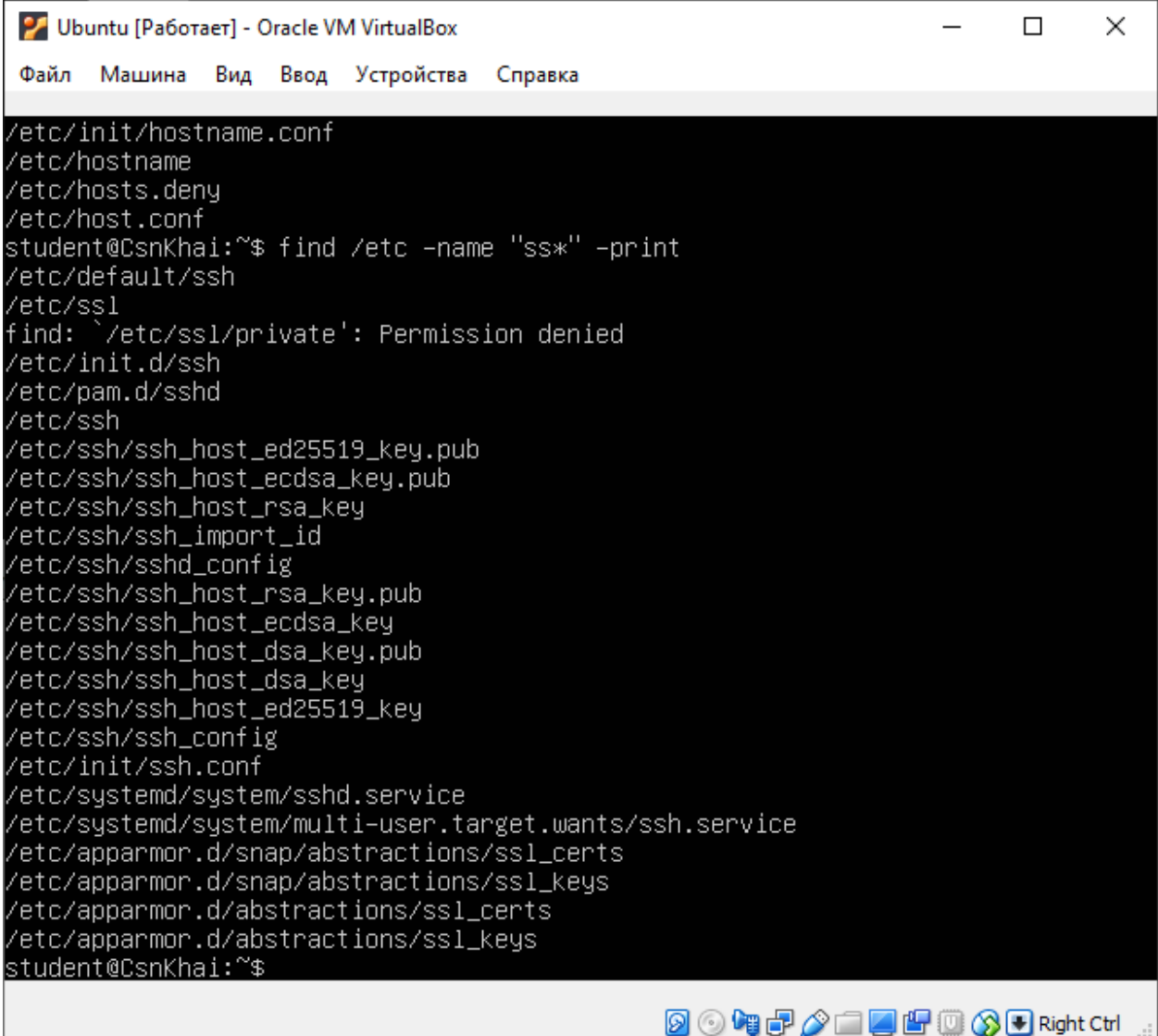
```
student@CsnKhai:~$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev            113860         4    113856   1% /dev
tmpfs           24780        388     24392   2% /run
/dev/sda1       1513328 1218092    200312  86% /
none              4           0         4   0% /sys/fs/cgroup
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
```

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.


```
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:~$
```

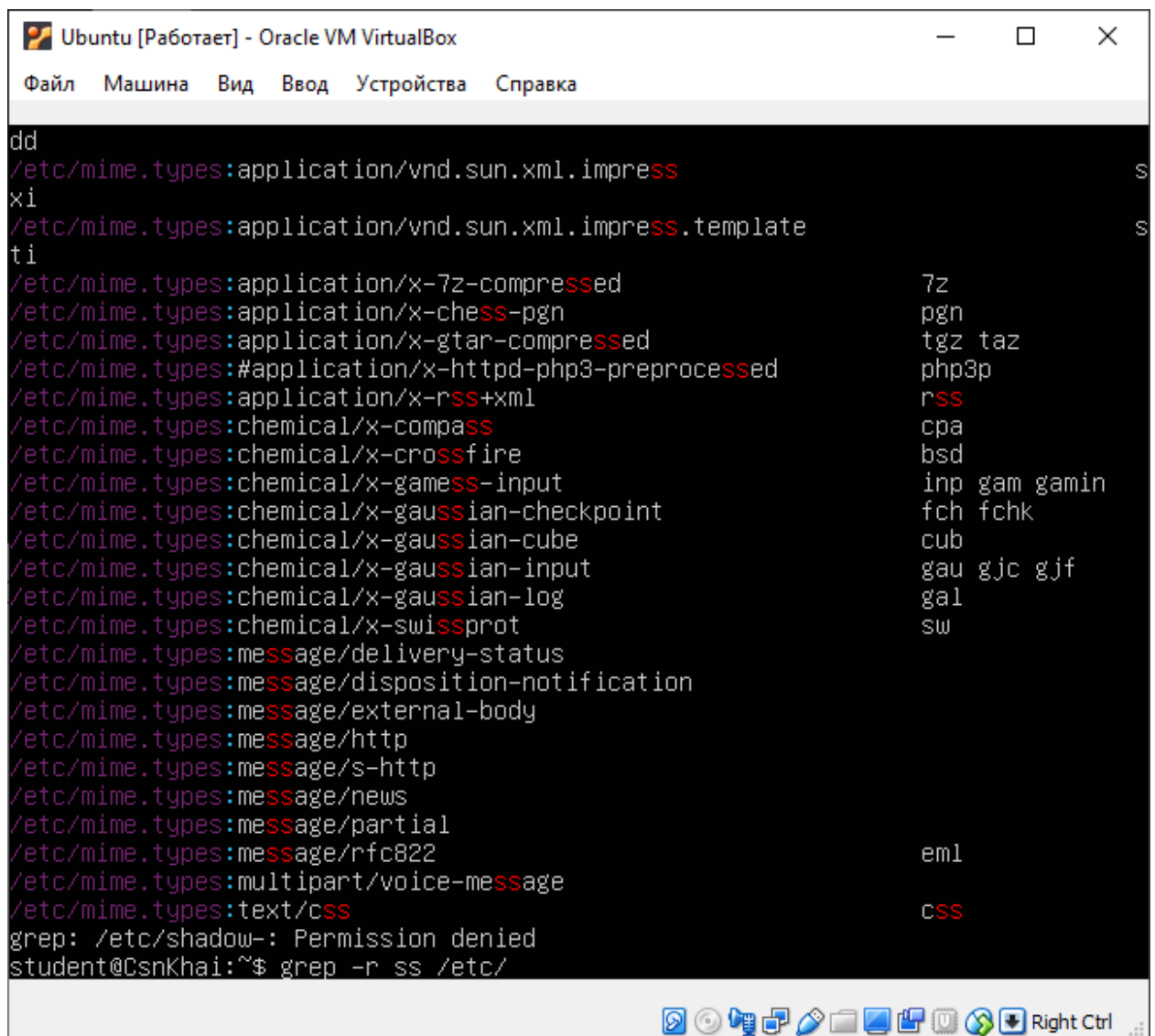
11) List all objects in /etc that contain the ss character sequence. How can I duplicate a similar command using a bunch of grep?



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

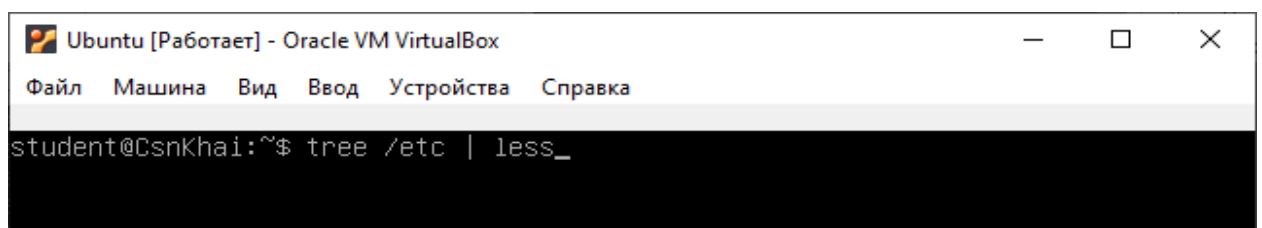
/etc/init/hostname.conf
/etc/hostname
/etc/hosts.deny
/etc/host.conf
student@CsnKhai:~$ find /etc -name "ss*" -print
/etc/default/ssh
/etc/ssl
find: `/etc/ssl/private': Permission denied
/etc/init.d/ssh
/etc/pam.d/sshd
/etc/ssh
/etc/ssh/ssh_host_ed25519_key.pub
/etc/ssh/ssh_host_ecdsa_key.pub
/etc/ssh/ssh_host_rsa_key
/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.



```
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          7z
/etc/mime.types:application/x-chess-pgn              pgn
/etc/mime.types:application/x-gtar-compressed         tgz taz
/etc/mime.types:#application/x-httpd-php3-preprocess php3p
/etc/mime.types:application/x-rss+xml                 rss
/etc/mime.types:chemical/x-compass                   cpa
/etc/mime.types:chemical/x-crossfire                  bsd
/etc/mime.types:chemical/x-games-input                inp gam gamin
/etc/mime.types:chemical/x-gaussian-checkpoint        fch fchk
/etc/mime.types:chemical/x-gaussian-cube              cub
/etc/mime.types:chemical/x-gaussian-input             gau gjc gjf
/etc/mime.types:chemical/x-gaussian-log               gal
/etc/mime.types:chemical/x-swissprot                  sw
/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                        eml
/etc/mime.types:multipart/voice-message
/etc/mime.types:text/css                              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.

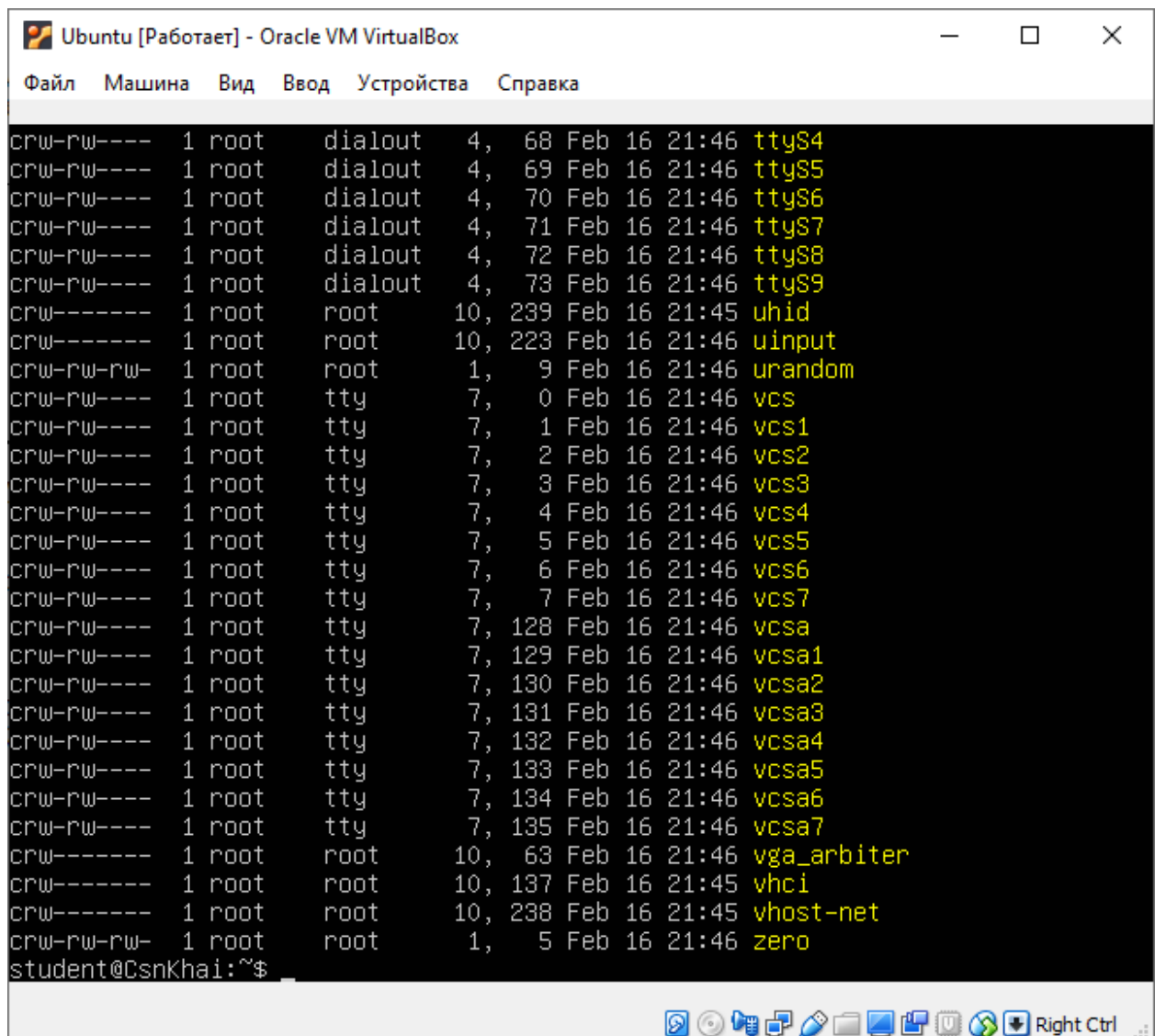


```
student@CsnKhai:~$ tree /etc | less_
```

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.



```
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:~$
```

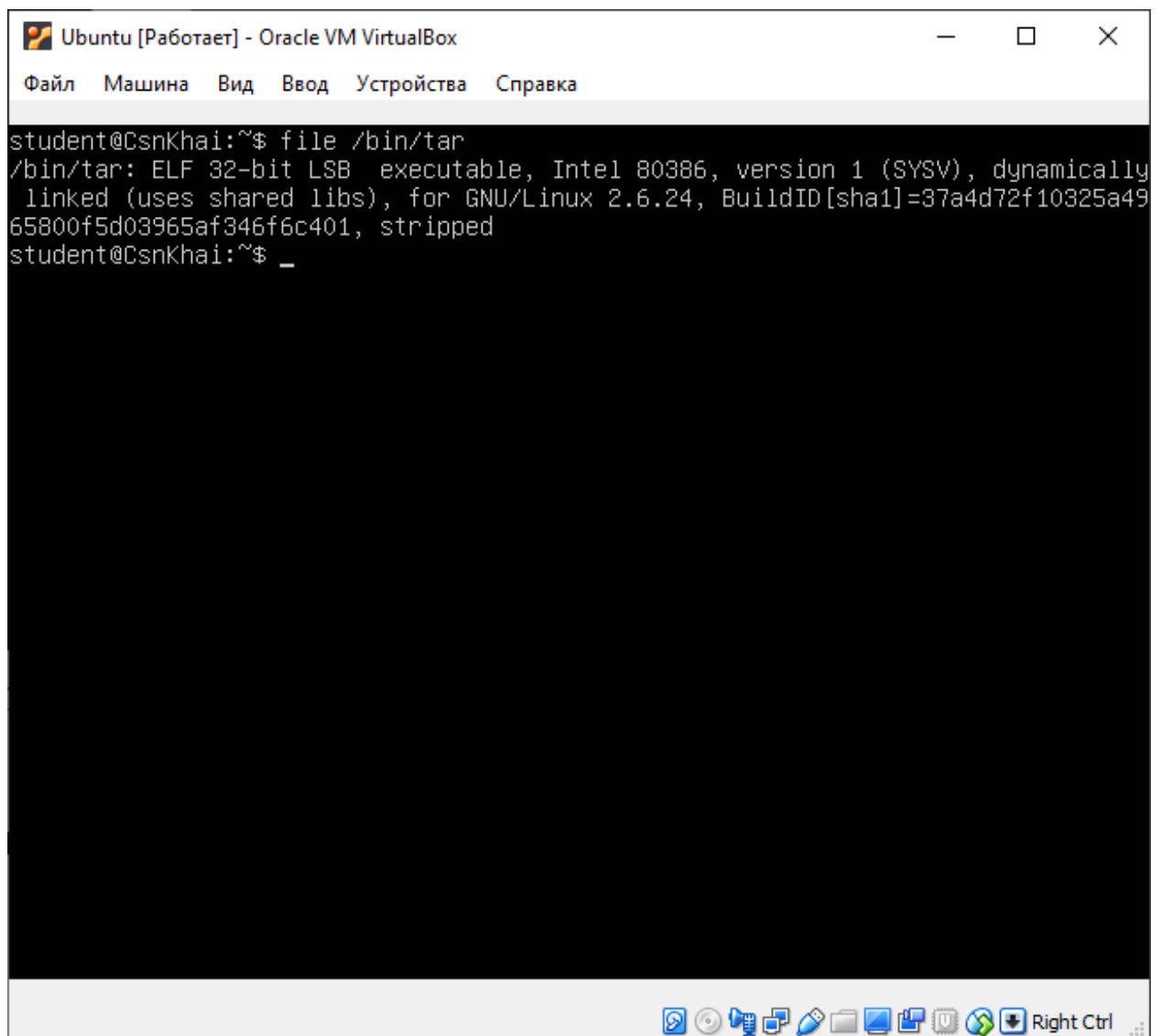
14) How to determine the type of file in the system, what types of files are there

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

Regular files to store information

Special files - for devices and tunnels

Directories



The screenshot shows a terminal window titled "Ubuntu [Работает] - Oracle VM VirtualBox". The window has a menu bar with "Файл", "Машина", "Вид", "Ввод", "Устройства", and "Справка". The terminal content shows a user running the command `file /bin/tar` and receiving the following output: `/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]=37a4d72f10325a4965800f5d03965af346f6c401, stripped`. The prompt then returns to `student@CsnKhai:~$`. The terminal has a black background with white text. At the bottom of the window is a taskbar with various icons and a "Right Ctrl" button.

```
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.

