

**Task 2. File system, user rights, network**

**1. Look through Root Filesystem content with command: `ls / | sort` Describe 5 first directories from the root file system. Fill results in the table below.**

I used *Linux version 3.10.0-957.12.2.el7.x86\_64 (mockbuild@builder.bsys.centos.org) (gcc version 4.8.5 20150623 (Red Hat 4.8.5-36) (GCC) ) #1 SMP Tue May 14 21:24:32 UTC 2019*

Directory name	Purpose
<b>/bin/</b>	<b>Essential command binaries</b> (for use by all users). It may also contain commands which are used indirectly by scripts. There must be no subdirectories in <b>/bin</b> . 33 commands are required in <b>/bin</b>
<b>/boot/</b>	<b>This directory contains everything required for the boot process</b> except configuration files not needed at boot time and the map installer. Thus <b>/boot</b> stores data that is used before the kernel begins executing user-mode programs.
<b>dev/</b>	<b>Device files.</b> It is the location of special or device files. Must contain a command named MAKEDEV
<b>/etc/</b>	<b>Host-specific system configuration.</b> Contains configuration files. A "configuration file" is a local file used to control the operation of a program; it must be static and cannot be an executable binary.
<b>/etc/opt/</b>	<b>Host-specific configuration files for add-on</b> application software packages must be installed within the directory <code>/etc/opt/&lt;subdir&gt;</code> , where <code>&lt;subdir&gt;</code> is the name of the subtree in <code>/opt</code> where the

	static data from that package is stored.
<b>/home/</b>	User home directories (optional).
<b>/lib/</b>	<b>Essential shared libraries and kernel modules.</b> Contains shared library images needed to boot the system and run the commands in the root filesystem, ie. by binaries in /bin and /sbin.
<b>/lib64/</b>	<b>Variant of /lib/.</b> This is commonly used for 64-bit or 32-bit support on systems which support multiple binary formats, but require libraries of the same name
<b>/media/</b>	<b>Mount point for removable media.</b> This directory contains subdirectories which are used as mount points for removable media such as floppy disks, cdroms and zip disks.
<b>/mnt/</b>	<b>Mount point for a temporarily mounted filesystem.</b> This directory is provided so that the system administrator may temporarily mount a filesystem as needed. The content of this directory is a local issue and should not affect the manner in which any program is run.
<b>opt/</b>	<b>Add-on application software packages.</b> /opt is reserved for the installation of add-on application software packages.
<b>/proc/</b>	<b>Kernel and process information virtual filesystem.</b>
<b>/root/</b>	<b>Home directory for the root user (optional)</b>
<b>/run/</b>	<b>Home directory for the root user (optional)</b>
<b>/sbin/</b>	<b>System binaries.</b> Utilities used for system administration (and other root-only commands) are stored in /sbin, /usr/sbin, and/usr/local/sbin. /sbin contains binaries

	essential for booting, restoring, recovering, and/or repairing the system in addition to the binaries in /bin.
<b>/srv/</b>	<b>Data for services provided by this system.</b> /srv contains site-specific data which is served by this system.
<b>/sys/</b>	<b>Kernel and process information virtual filesystem.</b> The sys filesystem is the location where information about devices, drivers, and some kernel features is exposed. Its underlying structure is determined by the particular Linux kernel being used at the moment, and is otherwise unspecified
<b>/tmp/</b>	<b>Temporary files.</b> Must be made available for programs that required temporary files.
<b>/usr/</b>	<b>/usr is shareable, read-only data.</b> That means that /usr should be shareable between various FHS-compliant hosts and must not be written to. Any information that is host-specific or varies with time is stored elsewhere.
<b>/var/</b>	<b>var contains variable data files.</b> This includes spool directories and files, administrative and logging data, and transient and temporary files.

## 2 Detect file type.

I used command `file [fileName] >> file_types.txt` . Results:

```
/dev/null: character special
/dev/zero: character special
/dev/sda: block special
/dev/tty: character special
/root: directory
/etc/passwd: ASCII text
/proc/mounts: symbolic link to `self/mounts'
/proc/mounts: empty
/bin/ls: ELF 64-bit LSB executable, x86-64, version 1 (SYSV), dynamically linked (uses shared
libs), for GNU/Linux 2.6.32, BuildID[sha1]=ceaf496f3aec08afced234f4f36330d3d13a657b,
stripped
/bin/zcat: POSIX shell script, ASCII text executable
```

Results file also available here:

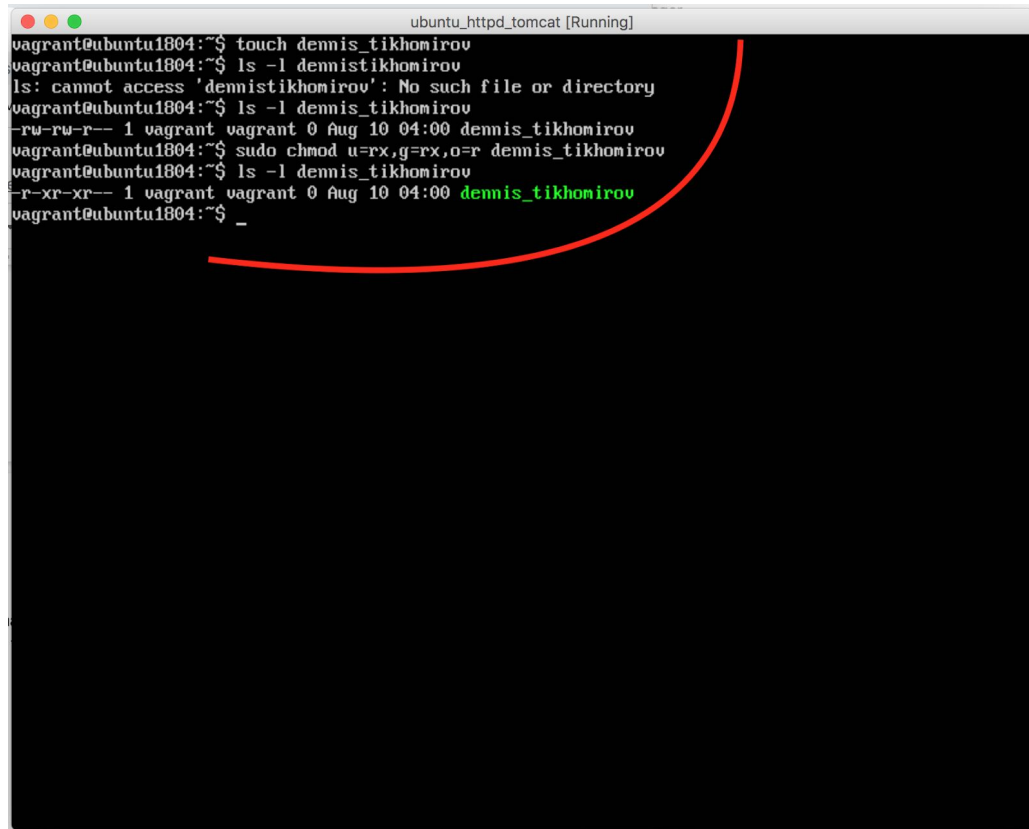
[https://github.com/dennis00010011b/epam-devops-training/blob/master/Task2/file\\_types.txt](https://github.com/dennis00010011b/epam-devops-training/blob/master/Task2/file_types.txt)

### 3 Processes, file attributes, user rights.

3.1 Create empty file in your home directory (file name == your FirstName\_LastName), set the following permissions for this file: User: read, write Group: read, execute Other: read

```
touch dennis_tikhomirov  
sudo chmod u=rw,g=rx,o=r
```

View result with command `ls -l dennis_tikhomirov`



```
ubuntu_httpd_tomcat [Running]  
vagrant@ubuntu1804:~$ touch dennis_tikhomirov  
vagrant@ubuntu1804:~$ ls -l dennis_tikhomirov  
ls: cannot access 'dennis_tikhomirov': No such file or directory  
vagrant@ubuntu1804:~$ ls -l dennis_tikhomirov  
-rw-rw-r-- 1 vagrant vagrant 0 Aug 10 04:00 dennis_tikhomirov  
vagrant@ubuntu1804:~$ sudo chmod u=rw,g=rx,o=r dennis_tikhomirov  
vagrant@ubuntu1804:~$ ls -l dennis_tikhomirov  
-r-xr-xr-- 1 vagrant vagrant 0 Aug 10 04:00 dennis_tikhomirov  
vagrant@ubuntu1804:~$ _
```

### 3.2 Create alias for the following command: *ping tut.by*

```
alias tutu="ping tut.by"
```

2.2.3 Run command “ping tut.by”(use alias from the previous task) with redirect output in any file. Run this command in background.

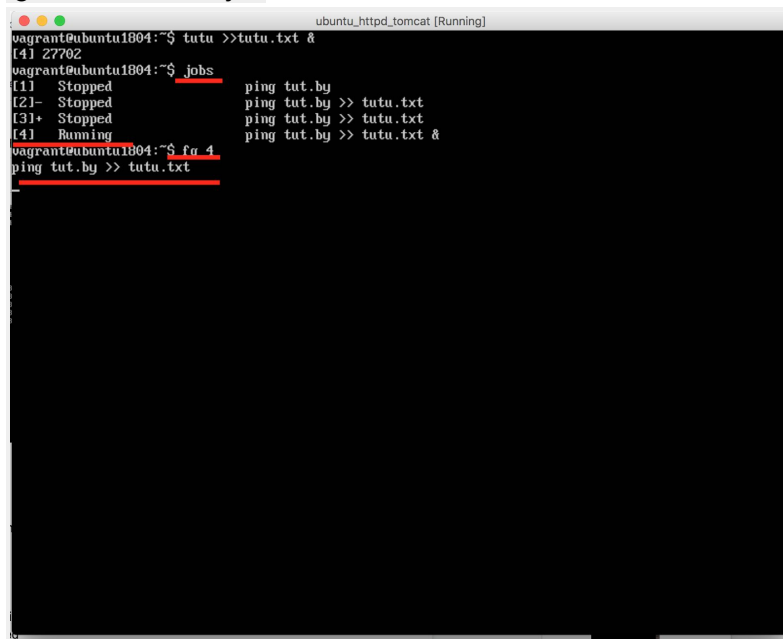
```
tutu >> tutu.txt &
```

```
ubuntu_httpd_tomcat [Running]
vagrant@ubuntu1804:~$ alias tutu="ping tut.by"
vagrant@ubuntu1804:~$ tutu
PING tut.by (178.172.160.4) 56(84) bytes of data.
64 bytes from 178-172-160-4.hosterby.com (178.172.160.4): icmp_seq=1 ttl=58 time=11.9 ms
64 bytes from 178-172-160-4.hosterby.com (178.172.160.4): icmp_seq=2 ttl=58 time=14.4 ms
64 bytes from 178-172-160-4.hosterby.com (178.172.160.4): icmp_seq=3 ttl=58 time=22.6 ms
64 bytes from 178-172-160-4.hosterby.com (178.172.160.4): icmp_seq=4 ttl=58 time=18.0 ms
64 bytes from 178-172-160-4.hosterby.com (178.172.160.4): icmp_seq=5 ttl=58 time=12.2 ms
64 bytes from 178-172-160-4.hosterby.com (178.172.160.4): icmp_seq=6 ttl=58 time=30.7 ms
64 bytes from 178-172-160-4.hosterby.com (178.172.160.4): icmp_seq=7 ttl=58 time=14.5 ms
64 bytes from 178-172-160-4.hosterby.com (178.172.160.4): icmp_seq=8 ttl=58 time=15.5 ms
^Z
[1]+  Stopped                  ping tut.by
vagrant@ubuntu1804:~$ tutu >> tutu.txt
^Z
[2]+  Stopped                  ping tut.by >> tutu.txt
vagrant@ubuntu1804:~$ cat tutu.txt
PING tut.by (178.172.160.3) 56(84) bytes of data.
64 bytes from 178-172-160-3.hosterby.com (178.172.160.3): icmp_seq=1 ttl=58 time=14.5 ms
64 bytes from 178-172-160-3.hosterby.com (178.172.160.3): icmp_seq=2 ttl=58 time=11.8 ms
64 bytes from 178-172-160-3.hosterby.com (178.172.160.3): icmp_seq=3 ttl=58 time=16.1 ms
64 bytes from 178-172-160-3.hosterby.com (178.172.160.3): icmp_seq=4 ttl=58 time=13.3 ms
64 bytes from 178-172-160-3.hosterby.com (178.172.160.3): icmp_seq=5 ttl=58 time=12.2 ms
vagrant@ubuntu1804:~$
```

## 2.2.4 Put the previous command from background to foreground

jobs

fg 4 # number of job

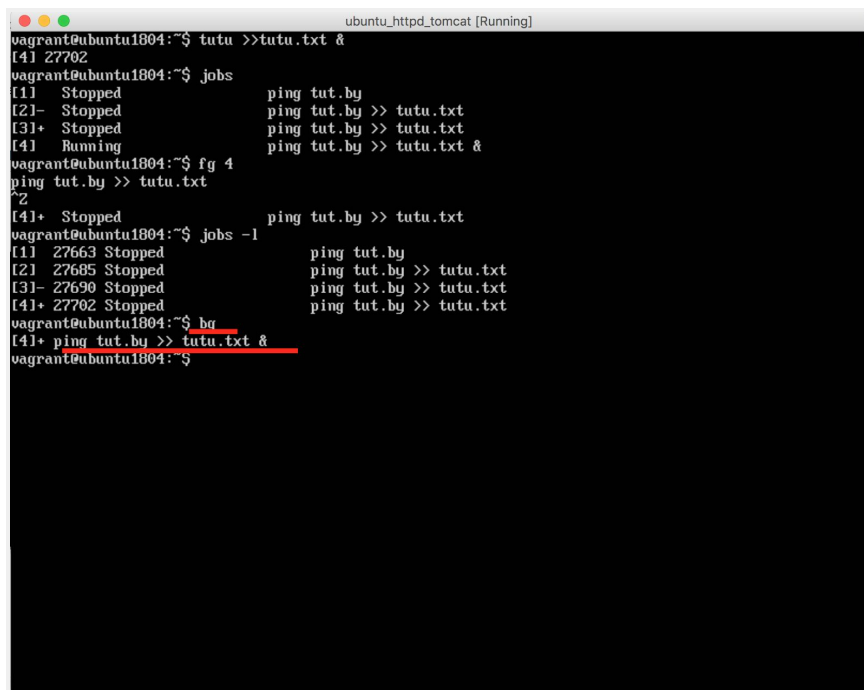


```
ubuntu_httpd_tomcat [Running]
vagrant@ubuntu1804:~$ tutu >>tutu.txt &
[4] 27702
vagrant@ubuntu1804:~$ jobs
[1]  Stopped                  ping tut.by
[2]- Stopped                  ping tut.by >> tutu.txt
[3]+ Stopped                  ping tut.by >> tutu.txt
[4]  Running                   ping tut.by >> tutu.txt &
vagrant@ubuntu1804:~$ fg 4
ping tut.by >> tutu.txt
```

## 2.2.5 Put the previous command from foreground to background

jobs

bg



```
ubuntu_httpd_tomcat [Running]
vagrant@ubuntu1804:~$ tutu >>tutu.txt &
[4] 27702
vagrant@ubuntu1804:~$ jobs
[1]  Stopped                  ping tut.by
[2]- Stopped                  ping tut.by >> tutu.txt
[3]+ Stopped                  ping tut.by >> tutu.txt
[4]  Running                   ping tut.by >> tutu.txt &
vagrant@ubuntu1804:~$ fg 4
ping tut.by >> tutu.txt
^Z
[4]+  Stopped                  ping tut.by >> tutu.txt
vagrant@ubuntu1804:~$ jobs -l
[1] 27663 Stopped              ping tut.by
[2] 27685 Stopped              ping tut.by >> tutu.txt
[3]- 27690 Stopped              ping tut.by >> tutu.txt
[4]+ 27702 Stopped              ping tut.by >> tutu.txt
vagrant@ubuntu1804:~$ bg
[4]+ ping tut.by >> tutu.txt &
vagrant@ubuntu1804:~$
```

2.2.6 Find and kill process of the previous command  
Make sure the process was really killed

jobs -l

kill 27702

```
ubuntu_httpd_tomcat [Running]
vagrant@ubuntu1804:~$ tutu >>tutu.txt &
[4] 27702
vagrant@ubuntu1804:~$ jobs
[1]  Stopped                  ping tut.by
[2]-  Stopped                  ping tut.by >> tutu.txt
[3]+  Stopped                  ping tut.by >> tutu.txt
[4]  Running                   ping tut.by >> tutu.txt &
vagrant@ubuntu1804:~$ fg 4
ping tut.by >> tutu.txt
^Z
[4]+  Stopped                  ping tut.by >> tutu.txt
vagrant@ubuntu1804:~$ jobs -l
[1] 27663 Stopped              ping tut.by
[2] 27685 Stopped              ping tut.by >> tutu.txt
[3]- 27690 Stopped              ping tut.by >> tutu.txt
[4]+ 27702 Stopped              ping tut.by >> tutu.txt
vagrant@ubuntu1804:~$ bg
[4]+  ping tut.by >> tutu.txt &
vagrant@ubuntu1804:~$ jobs -l
[1] 27663 Stopped              ping tut.by
[2]- 27685 Stopped              ping tut.by >> tutu.txt
[3]+ 27690 Stopped              ping tut.by >> tutu.txt
[4] 27702 Running              ping tut.by >> tutu.txt &
vagrant@ubuntu1804:~$ kill 27707
-bash: kill: (27707) - No such process
vagrant@ubuntu1804:~$ kill 27702
vagrant@ubuntu1804:~$ jobs -l
[1] 27663 Stopped              ping tut.by
[2]- 27685 Stopped              ping tut.by >> tutu.txt
[3]+ 27690 Stopped              ping tut.by >> tutu.txt
[4] 27702 Terminated          ping tut.by >> tutu.txt
vagrant@ubuntu1804:~$ _
```

2.2.7. Find all files which names starts from “test”

Command `find / test*`

```
CentOS [Running]
/home/dennistikhomirov/task1/completed.tar.gz
/home/dennistikhomirov/task1/message.txt
/home/dennistikhomirov/task1/task2
/home/dennistikhomirov/task1/task2/dennis_tikhomirov
/home/dennistikhomirov/task1/task2/pings.log
/home/dennistikhomirov/task1/task2/results
/home/dennistikhomirov/task1/file_types.txt
/home/dennistikhomirov/cinderella
/home/dennistikhomirov/open?id=1YuF30cU1A586aZkcxrA4cBR1x9zzkh7t-
/home/dennistikhomirov/Mail
/home/dennistikhomirov/sent
/home/dennistikhomirov/fu
/home/user1
/home/user1/.bash_logout
/home/user1/.bash_profile
/home/user1/.bashrc
/home/user1/.bash_history
/home/user1/.config
/home/user1/.config/mc
/home/user1/.config/mc/ini
/home/user1/.cache
/home/user1/.cache/mc
/home/user1/.cache/mc/Tree
/home/user1/.local
/home/user1/.local/share
/home/user1/.local/share/mc
/home/user1/.local/share/mc/history
/home/user2
/home/user2/.bash_logout
/home/user2/.bash_profile
/home/user2/.bashrc
/media
/mnt
/opt
/srv
find: 'test*': No such file or directory
dennistikhomirov@localhost task2$ _
```



## 2.3 Network, PUTTY, WINSXP

### 1. Recognize IP-address of your OS.

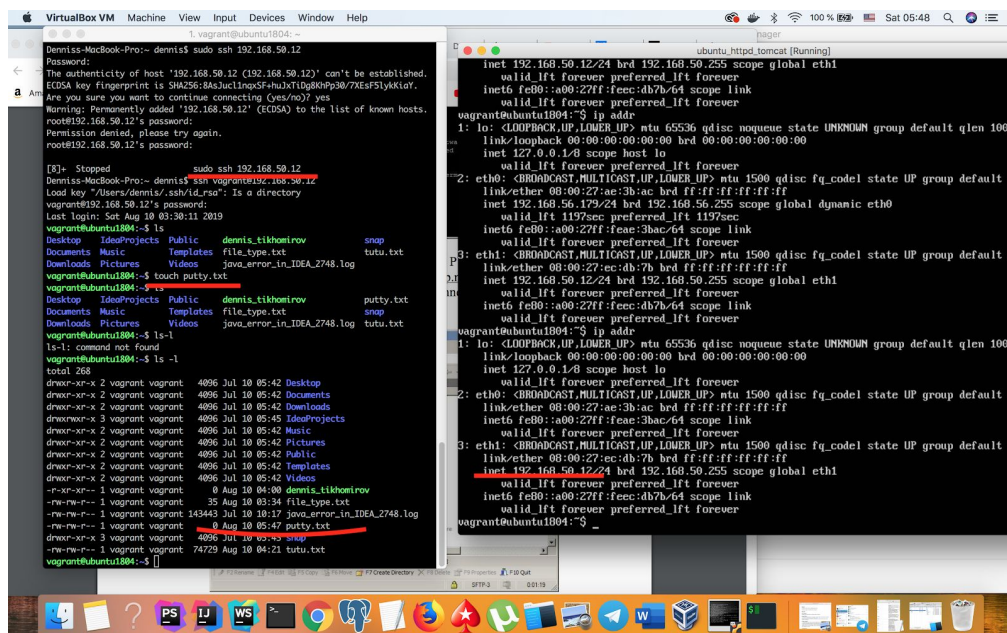
```
ubuntu_httpd_tomcat [Running]
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.50.12 netmask 255.255.255.0 broadcast 192.168.50.255
    inet6 fe80::a00:27ff:feec:db7b prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:ec:db:7b txqueuelen 1000 (Ethernet)
    RX packets 7 bytes 2791 (2.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 76 bytes 7896 (7.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    loop txqueuelen 1000 (Local Loopback)
    RX packets 117 bytes 10201 (10.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 117 bytes 10201 (10.2 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

vagrant@ubuntu1804:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:ae:3b:ac brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.18/24 brd 192.168.100.255 scope global dynamic eth0
        valid_lft 255760sec preferred_lft 255760sec
    inet6 fe80::a00:27ff:feae:3bac/64 scope link
        valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:ec:db:7b brd ff:ff:ff:ff:ff:ff
    inet 192.168.50.12/24 brd 192.168.50.255 scope global eth1
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:feec:db7b/64 scope link
        valid_lft forever preferred_lft forever
vagrant@ubuntu1804:~$
```

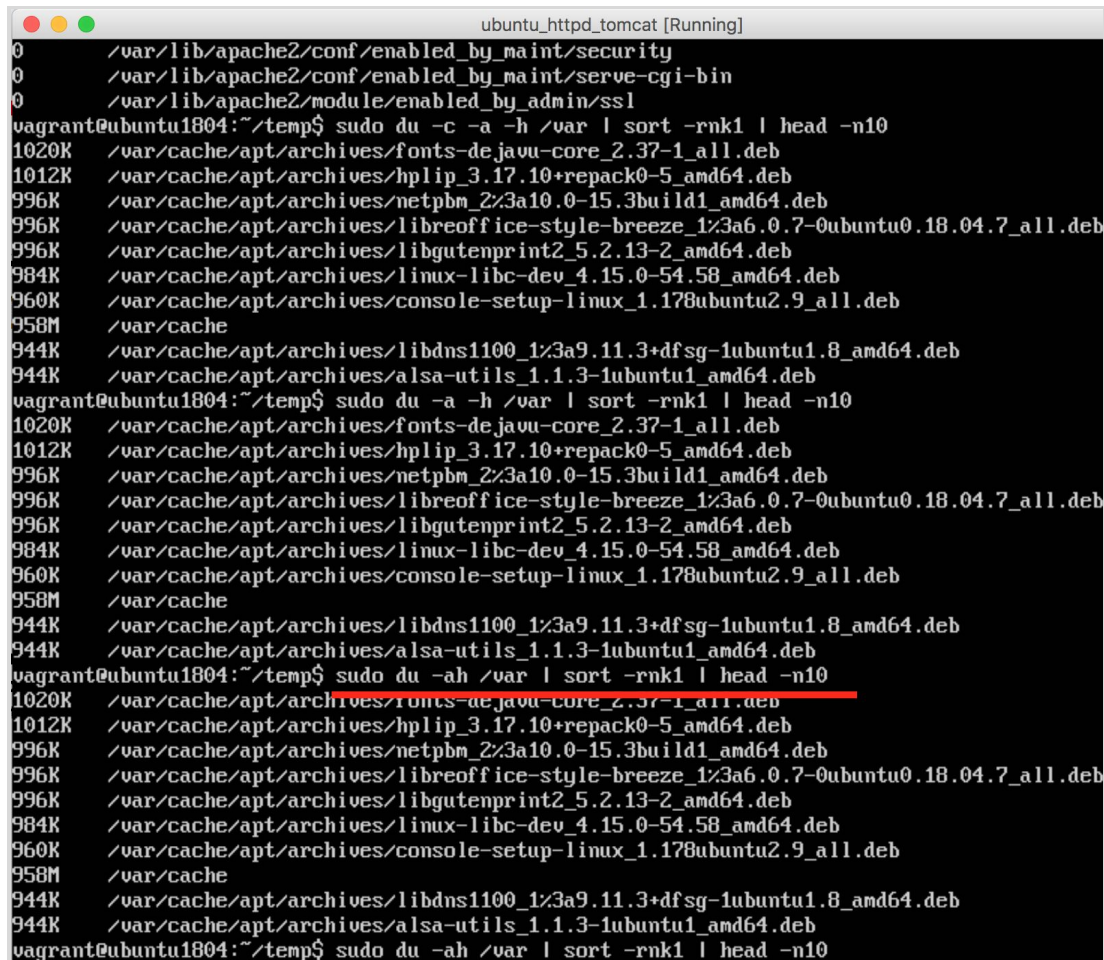
Since I have a MAC I used iTerm2 for establish SSH connection with virtual machine:



4. Customer has an issue with his production system and you only one person available at the moment. According to df command output 100% of disk space is used in /var directory. So your task is to write command that will find and print Top10 largest files in the /var directory. File type should be regular file.

Hint: you need options from commands du, sort, head, find and | (pipe) to build proper command chain.

```
sudo du -ah /var | sort -rnk1 | head -n10
```



```
ubuntu_httpd_tomcat [Running]
0 /var/lib/apache2/conf/enabled_by_maint/security
0 /var/lib/apache2/conf/enabled_by_maint/serve-cgi-bin
0 /var/lib/apache2/module/enabled_by_admin/ssl
vagrant@ubuntu1804:~/temp$ sudo du -c -a -h /var | sort -rnk1 | head -n10
1020K /var/cache/apt/archives/fonts-dejavu-core_2.37-1_all.deb
1012K /var/cache/apt/archives/hplip_3.17.10+repack0-5_amd64.deb
996K /var/cache/apt/archives/netpbm_2.3a10.0-15.3build1_amd64.deb
996K /var/cache/apt/archives/libreoffice-style-breeze_1:3a6.0.7-0ubuntu0.18.04.7_all.deb
996K /var/cache/apt/archives/libgutenprint2_5.2.13-2_amd64.deb
984K /var/cache/apt/archives/linux-libc-dev_4.15.0-54.58_amd64.deb
960K /var/cache/apt/archives/console-setup-linux_1.178ubuntu2.9_all.deb
958M /var/cache
944K /var/cache/apt/archives/libdns1100_1:3a9.11.3+dfsg-1ubuntu1.8_amd64.deb
944K /var/cache/apt/archives/alsa-utils_1.1.3-1ubuntu1_amd64.deb
vagrant@ubuntu1804:~/temp$ sudo du -a -h /var | sort -rnk1 | head -n10
1020K /var/cache/apt/archives/fonts-dejavu-core_2.37-1_all.deb
1012K /var/cache/apt/archives/hplip_3.17.10+repack0-5_amd64.deb
996K /var/cache/apt/archives/netpbm_2.3a10.0-15.3build1_amd64.deb
996K /var/cache/apt/archives/libreoffice-style-breeze_1:3a6.0.7-0ubuntu0.18.04.7_all.deb
996K /var/cache/apt/archives/libgutenprint2_5.2.13-2_amd64.deb
984K /var/cache/apt/archives/linux-libc-dev_4.15.0-54.58_amd64.deb
960K /var/cache/apt/archives/console-setup-linux_1.178ubuntu2.9_all.deb
958M /var/cache
944K /var/cache/apt/archives/libdns1100_1:3a9.11.3+dfsg-1ubuntu1.8_amd64.deb
944K /var/cache/apt/archives/alsa-utils_1.1.3-1ubuntu1_amd64.deb
vagrant@ubuntu1804:~/temp$ sudo du -ah /var | sort -rnk1 | head -n10
1020K /var/cache/apt/archives/fonts-dejavu-core_2.37-1_all.deb
1012K /var/cache/apt/archives/hplip_3.17.10+repack0-5_amd64.deb
996K /var/cache/apt/archives/netpbm_2.3a10.0-15.3build1_amd64.deb
996K /var/cache/apt/archives/libreoffice-style-breeze_1:3a6.0.7-0ubuntu0.18.04.7_all.deb
996K /var/cache/apt/archives/libgutenprint2_5.2.13-2_amd64.deb
984K /var/cache/apt/archives/linux-libc-dev_4.15.0-54.58_amd64.deb
960K /var/cache/apt/archives/console-setup-linux_1.178ubuntu2.9_all.deb
958M /var/cache
944K /var/cache/apt/archives/libdns1100_1:3a9.11.3+dfsg-1ubuntu1.8_amd64.deb
944K /var/cache/apt/archives/alsa-utils_1.1.3-1ubuntu1_amd64.deb
vagrant@ubuntu1804:~/temp$
```