Linux Basics exam

Write all answers here in this document. Use screenshots to support your answers. Screenshot must include the commands you used. For example, a simple **ls** from a directory is not adequate. If screenshot won't cover your answer or is missing some essential parts, you may add written answer as well in addition to screenshot.

Return the exam document before the given deadline into the Moodle return box in **PDF format**.

Maximum amount of points from the exam is 60 points. Question specific maximum points are marked after each question.

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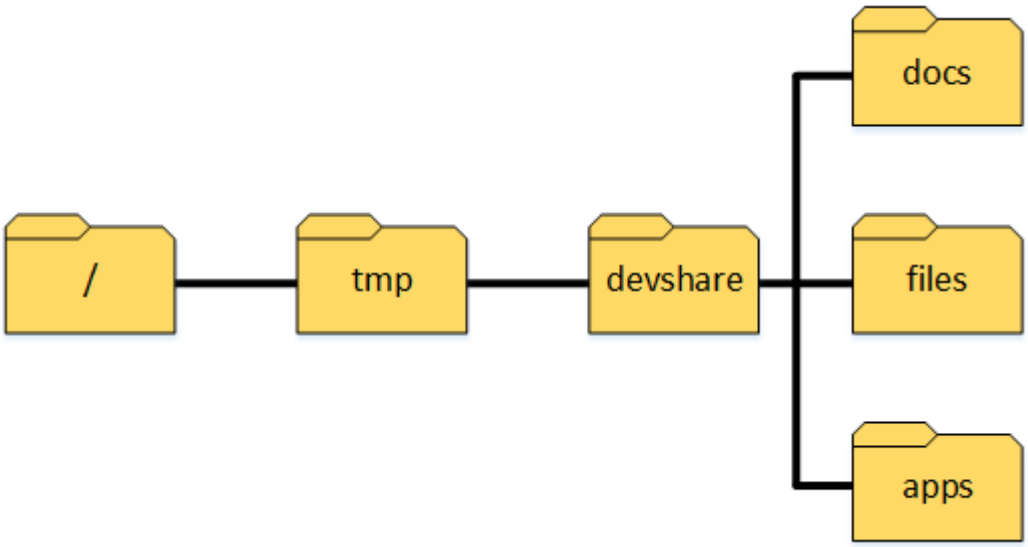
1. Create the directory structure presented below. [2p]




```
user@AC4892-Ubuntu:~$
user@AC4892-Ubuntu:~$ cd /
user@AC4892-Ubuntu:/$ pwd
/
```

```
user@AC4892-Ubuntu:/$ ls
bin   cdrom  dir2  etc            hi    lib    lib64   lost+found  mnt  proc  run   snap  swap.img  tmp  var
boot  dev    dir3  funetpage.html  home  lib32  libx32  media       opt  root  sbin  srv   sys       usr
```

```
user@AC4892-Ubuntu:/$ cd tmp
user@AC4892-Ubuntu:/tmp$ ls
```

```
user@AC4892-Ubuntu:/tmp$ mkdir devshare
```

```
user@AC4892-Ubuntu:/tmp$ cd devshare
user@AC4892-Ubuntu:/tmp/devshare$ mkdir docs files apps
user@AC4892-Ubuntu:/tmp/devshare$ ls
apps  docs  files
```

2. Create user group called *developers*. [2p]

```
user@AC4892-Ubuntu:/tmp/devshare$ sudo groupadd developers
[sudo] password for user:
```

```
user@AC4892-Ubuntu:/tmp/devshare$ sudo usermod -G developers user
```

```
user@AC4892-Ubuntu:/tmp/devshare$ groups user
user : user developers
```

3. Create user *arto* with home directory and set bash as user's default shell. In addition, set user password. [3p]

```
user@AC4892-Ubuntu:/tmp/devshare$ sudo useradd -m -s /bin/bash arto
```

```
user@AC4892-Ubuntu:/tmp/devshare$ sudo passwd arto
New password:
Retype new password:
passwd: password updated successfully
```

4. Change directory *devshare* owner group to be developers so that owner permissions inherit to subdirectories. [3p]

```
user@AC4892-Ubuntu:/$ sudo chown -R :developers /tmp/devshare
```

```
user@AC4892-Ubuntu:/$ ls -l /tmp/devshare
total 12
drwxrwxr-x 2 user developers 4096 Dec  1 10:10 apps
drwxrwxr-x 2 user developers 4096 Dec  1 10:10 docs
drwxrwxr-x 2 user developers 4096 Dec  1 10:10 files
```

5. Give write permissions for group developers to *devshare* directory and its subdirectories. [2p]

```
user@AC4892-Ubuntu:/$ chmod -R 721 /tmp/devshare
user@AC4892-Ubuntu:/$ ls -l /tmp/devshare
total 12
drwx-w---x 2 user developers 4096 Dec  1 10:10 apps
drwx-w---x 2 user developers 4096 Dec  1 10:10 docs
drwx-w---x 2 user developers 4096 Dec  1 10:10 files
```

6. Change permissions for directory */tmp/devshare/apps* so that only directory owner has permissions for the directory. [2p]

```
user@AC4892-Ubuntu:/$ chmod 700 /tmp/devshare/apps
user@AC4892-Ubuntu:/$ ls -l /tmp/devshare
total 12
drwx------ 2 user developers 4096 Dec  1 10:10 apps
drwx-w---x 2 user developers 4096 Dec  1 10:10 docs
drwx-w---x 2 user developers 4096 Dec  1 10:10 files
```

7. Set *developers* as *arto's* primary group and add *arto* to group *sudo*. [3p]

```
user@AC4892-Ubuntu:/$ sudo usermod -G developers arto
user@AC4892-Ubuntu:/$ sudo usermod -G sudo arto
```

8. Switch to user arto so that the whole environment will be changed (**do the following exercises as user arto!**) [3p]

```
user@AC4892-Ubuntu:/$ su arto
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

arto@AC4892-Ubuntu:/$ pwd
/
```

9. Create a new directory called *exam* to *arto's* home directory using absolute path. Create the following two files inside *exam* directory using relative path: *file1.txt* and *file2.txt*. Write the following line to *file1.txt*: **This is quite easy**. [4p]

```
arto@AC4892-Ubuntu:/$ mkdir /home/arto/exam
arto@AC4892-Ubuntu:/$ cd home/arto/exam
arto@AC4892-Ubuntu:~/exam$ touch file1.txt file2.txt
arto@AC4892-Ubuntu:~/exam$ nano file.txt
```

```
  GNU nano 4.8
This is Quite easy
```

10. Copy the *exam* directory to previously created directory */tmp/devshare/docs*. [2p]

```
user@AC4892-Ubuntu:~$ su arto
Password:
arto@AC4892-Ubuntu:/home/user$ cd /
arto@AC4892-Ubuntu:/$ sudo cp -R /home/arto/exam /tmp/devshare/docs
[sudo] password for arto:
```

```
arto@AC4892-Ubuntu:/tmp/devshare/docs$ sudo ls
exam
```

11. Download the following package using wget tool and move it to directory */tmp/devshare/files* with a new name *data.tar.gz*: http://student.labranet.jamk.fi/~hantt/exam/examdata.tar.gz. [3p]

```
arto@AC4892-Ubuntu:/$ sudo wget http://student.labranet.jamk.fi/~hantt/exam/examdata.tar.gz
--2022-12-01 10:42:22--  http://student.labranet.jamk.fi/~hantt/exam/examdata.tar.gz
Resolving student.labranet.jamk.fi (student.labranet.jamk.fi)... 192.168.20.20
Connecting to student.labranet.jamk.fi (student.labranet.jamk.fi)|192.168.20.20|:80... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://student.labranet.jamk.fi/~hantt/exam/examdata.tar.gz [following]
--2022-12-01 10:42:22--  https://student.labranet.jamk.fi/~hantt/exam/examdata.tar.gz
Connecting to student.labranet.jamk.fi (student.labranet.jamk.fi)|192.168.20.20|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1248 (1.2K) [application/x-gzip]
Saving to: ‘examdata.tar.gz’

examdata.tar.gz             100%[=========================================>]   1.22K  --.-KB/s    in 0s

2022-12-01 10:42:22 (421 MB/s) - ‘examdata.tar.gz’ saved [1248/1248]
```

```
arto@AC4892-Ubuntu:/$ ls
bin    dev   etc              h1    lib32   lost+found  opt   run   srv       tmp
boot   dir2  examdata.tar.gz  home  lib64   media       proc  sbin  swap.img  usr
cdrom  dir3  funetpage.html   lib   libx32  mnt         root  snap  sys       var
```

```
arto@AC4892-Ubuntu:/$ sudo mv examdata.tar.gz /tmp/devshare/files/data.tar.gz
```

```
arto@AC4892-Ubuntu:/$ sudo mv examdata.tar.gz /tmp/devshare/files/data.tar.gz
arto@AC4892-Ubuntu:/$ cd /tmp/devshare/files
arto@AC4892-Ubuntu:/tmp/devshare/files$ sudo ls
data.tar.gz
```

12. Extract the package data.tar.gz with one command. Print the content of file *data1.txt* to command line. [2p]

```
arto@AC4892-Ubuntu:/$ sudo tar -xvf /tmp/devshare/files/data.tar.gz
data1.txt
data2.txt
```

```
arto@AC4892-Ubuntu:/$ cat data1.txt
Spicy jalapeno bacon ipsum dolor amet burgdoggen chicken jowl, biltong beef shank cow doner ham hock ball tip swine po
 belly chuck turducken. Hamburger filet mignon bresaola, tenderloin corned beef sausage swine drumstick pork t-bone po
 chop chuck brisket buffalo. Tail fatback kielbasa chislic pork chop doner cow porchetta leberkas ground round bresaol
shank tenderloin pork belly. Meatloaf chicken ribeye pancetta flank pork chop corned beef kielbasa ham hock pig. Porch
ta turkey shank swine prosciutto cow. Bacon pastrami shoulder landjaeger doner.

Beef landjaeger doner leberkas, jowl jerky tri-tip cupim tongue chicken pig chislic. Alcatra filet mignon short ribs,
g ribeye shank pork loin. Ham hock jerky beef porchetta pastrami turkey chislic pork belly prosciutto short ribs alcat
. Drumstick prosciutto shoulder short ribs. Beef ribs burgdoggen buffalo hamburger pastrami, short loin rump alcatra p
chetta spare ribs meatloaf shank leberkas. Andouille fatback brisket meatball bacon.

Pork chicken shankle short loin corned beef. Kielbasa shankle kevin sausage, flank porchetta meatball. Shank leberkas
rk loin, chicken kevin shankle boudin turducken drumstick t-bone cow venison hamburger. Turducken meatball ground roun
 tri-tip swine sirloin picanha corned beef capicola jerky tongue filet mignon shoulder. Pork chop picanha pastrami tur
y. Ball tip swine frankfurter, brisket shankle buffalo ham shank sausage tenderloin cow.
```

13. Find results for string **zulu** using apt package management and redirect the results to file *apt-listing.txt* in *arto's* home directory using absolute path. [3p]

14. List the content from *files* directory using long listing format so that only objects (files, directories, links etc.) that have last been edited in year 1994 will be listed. [4p]

```
arto@AC4892-Ubuntu:/tmp/devshare/files$ sudo ls -l
total 4
-rw-r--r-- 1 root root 1248 Apr  1  2021 data.tar.gz
```

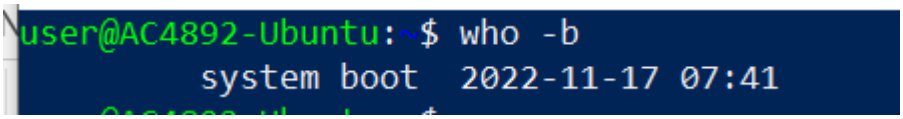
15. Create new permanent alias for user *arto*, which will print the current date to command line. Verify that yout alias works. [5p]

16. **Return to your previous user**. Use find command to find directories with name including the string **ap** inside */etc* directory using administrative privileges. [3p]

```
user@AC4892-Ubuntu:~$ sudo find /etc app*
```

17. Use systemd timer to schedule a backup of *devshare* directory to your user's home directory using tar command. Backup should be taken every Sunday at 15.30. [5p]

18. At what time, was the previous system boot? [3p]



19. List your user's groups and write the output to file called *my_groups.txt*. Then create a tar archive called *group_package.tar* including that file. [3p]

20. Remove group *developers*, user *arto* and arto's home directory from the system. [3p]