Lab 6(Using yum)

17. Attempt to run the command gnuplot. You should find that it is not installed.

```
mohamedtorkey@torkey:~$ gnuplot
bash: gnuplot: command not found...
^C
mohamedtorkey@torkey:~$
```

18. Search for the plotting packages.

```
mohamedtorkey@torkey:~$ yum search plot
Last metadata expiration check: 4:26:42 ago on Fri 15 Dec 2023 17:46:51 EET.
========================= Name & Summary Matched: plot =========================
R-gplots.noarch : Various R Programming Tools for Plotting Data
R-scatterplot3d.noarch : 3D Scatter Plot
R-tkrplot.x86_64 : TK Rplot
gnuplot.x86_64 : A program for plotting mathematical expressions and data
gnuplot-common.x86_64 : The common gnuplot parts
gnuplot-doc.noarch : Documentation fo bindings for the gnuplot main application
gnuplot-latex.noarch : Configuration for LaTeX typesetting using gnuplot
gnuplot-minimal.x86_64 : Minimal version of program for plotting mathematical
```

19. Find out more information about the gunuplot package.

```
mohamedtorkey@torkey:~$ yum info gnuplot
Last metadata expiration check: 4:40:25 ago on Fri 15 Dec 2023 17:46:51 EET.
Installed Packages
Name         : gnuplot
Version      : 5.4.8
Release      : 2.fc39
Architecture : x86_64
Size         : 1.9 M
Source       : gnuplot-5.4.8-2.fc39.src.rpm
Repository   : @System
From repo    : fedora
Summary      : A program for plotting mathematical expressions and data
URL          : http://www.gnuplot.info/
License      : gnuplot and MIT
Description  : Gnuplot is a command-line driven, interactive function plotting
             : program especially suited for scientific data representation.
```

20. Install the gnuplot package.

```
mohamedtorkey@torkey:~$ sudo yum install gnuplot  -y
[sudo] password for mohamedtorkey:
Last metadata expiration check: 0:19:28 ago on Fri 15 Dec 2023 22:09:16 EET.
Package gnuplot-5.4.8-2.fc39.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
mohamedtorkey@torkey:~$
```

21. Attempt to remove the gnuplot package, but say no
How many packages would be removed

```
mohamedtorkey@torkey:~$ sudo yum remove gnuplot
Dependencies resolved.
================================================================================
 Package                Architecture Version              Repository      Size
================================================================================
Removing:
 gnuplot                x86_64       5.4.8-2.fc39         @fedora        1.9 M
Removing unused dependencies:
 dejavu-sans-fonts      noarch       2.37-20.fc39         @updates       5.5 M
 gnuplot-common         x86_64       5.4.8-2.fc39         @fedora        1.7 M
 libcerf                x86_64       2.3-2.fc39           @fedora         55 k

Transaction Summary
================================================================================
Remove  4 Packages

Freed space: 9.1 M
Is this ok [y/N]:
```

22. List all installed packages in your system.

```
mohamedtorkey@torkey:~$ sudo yum list installed
Installed Packages
Box2D.x86_64                                2.4.1-11.fc39
a
ImageMagick.x86_64                          1:7.1.1.15-1.fc39
a
ImageMagick-libs.x86_64                     1:7.1.1.15-1.fc39
```

23. View the files in the initscripts package

```
mohamedtorkey@torkey:~$ sudo rpm -ql initscripts
/etc/init.d
/etc/rc.d
/etc/rc.d/init.d
/etc/rc.d/init.d/functions
/etc/rc.d/rc0.d
/etc/rc.d/rc1.d
/etc/rc.d/rc2.d
/etc/rc.d/rc3.d
/etc/rc.d/rc4.d
/etc/rc.d/rc5.d
```

24. Get general information about bash rpm.

```
mohamedtorkey@torkey:~$ sudo rpm -ql bash
/etc/skel/.bash_logout
/etc/skel/.bash_profile
/etc/skel/.bashrc
/usr/bin/alias
/usr/bin/bash
/usr/bin/bashbug
```

25. Have the files from the pam package changed since it was installed.

```
mohamedtorkey@torkey:~$ rpm -V pam
..?......  c /etc/security/opasswd
..?......    /usr/sbin/unix_update
mohamedtorkey@torkey:~$ S
```

26. Which installed packages have gnome in their names?

```
mohamedtorkey@torkey:~$ sudo yum list installed |grep gnomes
mohamedtorkey@torkey:~$ sudo rpm -qa | grep gnomes
mohamedtorkey@torkey:~$
```

28. Search for software resemble the Photoshop software other than Gimp and install it.

```
mohamedtorkey@torkey:~$ sudo yum install pinta
Last metadata expiration check: 0:59:12 ago on Fri 15 Dec 2023 22:09:16 EET.
Dependencies resolved.
--------------------------------------------------------------------------------
```

```
mohamedtorkey@torkey:~$ pinta --version
1.7.1
mohamedtorkey@torkey:~$
```

Lab 7

1. Using the useradd command, add accounts for the following users in your system: user1, user2, user3, user4, user5, user6 and user7. Remember to give each user a password.

```
mohamedtorkey@torkey:~$ sudo adduser user1
mohamedtorkey@torkey:~$ sudo adduser user2
mohamedtorkey@torkey:~$ sudo adduser user3
mohamedtorkey@torkey:~$ sudo adduser user4
mohamedtorkey@torkey:~$ sudo adduser user5
mohamedtorkey@torkey:~$ sudo adduser user6
mohamedtorkey@torkey:~$ sudo adduser user7
```

```
mohamedtorkey@torkey:~$ tail /etc/passwd |grep user
user1:x:1008:1009::/home/user1:/bin/bash
user2:x:1009:1010::/home/user2:/bin/bash
user3:x:1010:1011::/home/user3:/bin/bash
user4:x:1011:1012::/home/user4:/bin/bash
user5:x:1012:1013::/home/user5:/bin/bash
user6:x:1013:1014::/home/user6:/bin/bash
user7:x:1014:1015::/home/user7:/bin/bash
mohamedtorkey@torkey:~$
```

2. Using the groupadd command, add the following groups to your system.

Group	GID
sales	10000
hr	10001
web	10002

Why should you set GID in this manner instead of allowing the system to set the GID by default?

Because the system will get the last GID created and increment it ,this may make Debugging .

```
mohamedtorkey@torkey:~$ tail -4 /etc/group
user7:x:1015:
sales:x:10000:
hr:x:10001:
web:x:10002:
mohamedtorkey@torkey:~$
```

3. Using the usermod command to add user1 and user2 to the sales secondary group, user3 and user4 to the hr secondary group. User5 and user6 to web secondary group. And add user7 to all secondary groups

```
mohamedtorkey@torkey:~$ sudo usermod user1 -G sales
[sudo] password for mohamedtorkey:
mohamedtorkey@torkey:~$ sudo usermod user2 -G sales
mohamedtorkey@torkey:~$ sudo usermod user3 -G hr
mohamedtorkey@torkey:~$ sudo usermod user4 -G hr
mohamedtorkey@torkey:~$ sudo usermod user5 -G web
mohamedtorkey@torkey:~$ tail -3 /etc/group
sales:x:10000:user1,user2,user7
hr:x:10001:user3,user4,user7
web:x:10002:user5,user6,user7
mohamedtorkey@torkey:~$
```

4. Login as each user and use id command to verify that they are in the appropriate groups. How else might you verify this information?

```
user6@torkey:~$ id
uid=1013(user6) gid=1014(user6) groups=1014(user6),10002(web) context=unconfined
_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
user6@torkey:~$
```

```
user5@torkey:~$ id
uid=1012(user5) gid=1013(user5) groups=1013(user5),10002(web) context=unconfined
_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
```

```
user4@torkey:~$ id
uid=1011(user4) gid=1012(user4) groups=1012(user4),10001(hr) context=unconfined_
u:unconfined_r:unconfined_t:s0-s0:c0.c1023
user4@torkey:~$
```

```
user3@torkey:~$ id
uid=1010(user3) gid=1011(user3) groups=1011(user3),10001(hr) context=unconfined_
u:unconfined_r:unconfined_t:s0-s0:c0.c1023
user3@torkey:~$
```

```
user2@torkey:~$ id
uid=1009(user2) gid=1010(user2) groups=1010(user2),10000(sales) context=unconfin
ed_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
user2@torkey:~$
```

```
user1@torkey:~$ id
uid=1008(user1) gid=1009(user1) groups=1009(user1),10000(sales) context=unconfin
ed_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
```

```
user7@torkey:~$ id
uid=1014(user7) gid=1015(user7) groups=1015(user7),10000(sales),10001(hr),10002(
web) context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
user7@torkey:~$
```

```
mohamedtorkey@torkey:~$ sudo tail -7 /etc/passwd
user1:x:1008:1009::/home/user1:/bin/bash
user2:x:1009:1010::/home/user2:/bin/bash
user3:x:1010:1011::/home/user3:/bin/bash
user4:x:1011:1012::/home/user4:/bin/bash
user5:x:1012:1013::/home/user5:/bin/bash
user6:x:1013:1014::/home/user6:/bin/bash
user7:x:1014:1015::/home/user7:/bin/bash
```

5. Create a directory called /depts with a sales, hr, and web directory within the /depts directory.

```
mohamedtorkey@torkey:~$ sudo  mkdir /depts
[sudo] password for mohamedtorkey:
mohamedtorkey@torkey:~$ sudo  mkdir /depts/sales
mohamedtorkey@torkey:~$ sudo  mkdir /depts/hr
mohamedtorkey@torkey:~$ sudo  mkdir /depts/web
```

```
mohamedtorkey@torkey:~$ ls /depts/
hr   sales   web
mohamedtorkey@torkey:~$
```

6. Using the chgrp command, set the group ownership of each directory to the group with the matching name

```
mohamedtorkey@torkey:~$ sudo chgrep hr /depts/hr/
sudo: chgrep: command not found
mohamedtorkey@torkey:~$ sudo chgrp hr /depts/hr/
mohamedtorkey@torkey:~$ sudo chgrp sales /depts/sales
mohamedtorkey@torkey:~$ sudo chgrp web /depts/web
mohamedtorkey@torkey:~$ ll /depts
total 0
drwxr-xr-x. 1 root hr    0 Dec 15 15:46 hr
drwxr-xr-x. 1 root sales 0 Dec 15 15:46 sales
drwxr-xr-x. 1 root web   0 Dec 15 15:46 web
```

7. Set the permissions on the /depts directory to 755, and each subdirectory to 770

```
mohamedtorkey@torkey:~$ sudo chmod 755 /depts
mohamedtorkey@torkey:~$ sudo chmod 770 /depts/*
mohamedtorkey@torkey:~$ ll /depts/
total 0
drwxrwx---. 1 root hr    0 Dec 15 15:46 hr
drwxrwx---. 1 root sales 0 Dec 15 15:46 sales
drwxrwx---. 1 root web   0 Dec 15 15:46 web
mohamedtorkey@torkey:~$
```

8. Set the set-gid bit on each departmental directory

```
mohamedtorkey@torkey:~$ sudo chmod g+s /depts/*
mohamedtorkey@torkey:~$ ll /depts/
total 0
drwxrws---. 1 root hr    0 Dec 15 15:46 hr
drwxrws---. 1 root sales 0 Dec 15 15:46 sales
drwxrws---. 1 root web   0 Dec 15 15:46 web
mohamedtorkey@torkey:~$ s
```

9. Use the su command to switch to the user2 account and attempt the following commands:
   touch /depts/sales/user2.txt
   touch /depts/hr/ user2.txt
   touch /depts/web/ user2.txt

   Which of these commands succeeded and which failed? What is the group ownership of the files that were created?
   The first one only because user2 is in the group that owns the sales directory
   sales group because of the set-gid

```
user2@torkey:~$ touch /depts/sales/user2.txt
user2@torkey:~$ touch /depts/hr/user2.txt
touch: cannot touch '/depts/hr/user2.txt': Permission denied
user2@torkey:~$ touch /depts/web/user2.txt
touch: cannot touch '/depts/web/user2.txt': Permission denied
user2@torkey:~$
```

10. Configure sudoers file to allow user3 and user4 to use /bin/mount and /bin/umount commands, while allowing user5 only to use fdisk command.

```
#Allow user3 and user4 to use /bin/mount /bin/umount
user3,user4 ALL=(ALL) /usr/bin/mount, /usr/bin/unmount
user5       ALL=(ALL) /usr/sbin/fdisk
```

11. Login by user3 and try to unmount /boot.

```
mohamedtorkey@torkey:~$ sudo umount /boot
```

```
user3@torkey:~$ sudo umount  /boot
[sudo] password for user3:
Sorry, user user3 is not allowed to execute '/usr/bin/umount /boot' as root on to
user3@torkey:~$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sr0          11:0    1    2G  0 rom  /run/media/mohamedtorkey/Fedora-WS-Live-39-1
zram0       252:0    0  1.9G  0 disk [SWAP]
nvme0n1     259:0    0   20G  0 disk
├─nvme0n1p1 259:1    0    1M  0 part
├─nvme0n1p2 259:2    0    1G  0 part
└─nvme0n1p3 259:3    0   19G  0 part /home
                                    /
```

12. Login by user4 and remount /boot. Also try to view the partition table using fdisk.

```
user4@torkey:~$ sudo userdel user2
Sorry, user user4 is not allowed to execute '/usr/sbin/userdel user2' as root on torkey.
user4@torkey:~$ sudo mount /boot
user4@torkey:~$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sr0          11:0    1    2G  0 rom  /run/media/mohamedtorkey/Fedora-WS-Live-39-1-5
zram0       252:0    0  1.9G  0 disk [SWAP]
nvme0n1     259:0    0   20G  0 disk
├─nvme0n1p1 259:1    0    1M  0 part
├─nvme0n1p2 259:2    0    1G  0 part /boot
│                                   /boot
│                                   /boot
└─nvme0n1p3 259:3    0   19G  0 part /home
                                    /
user4@torkey:~$
```

13. Create a directory with permissions rwxrwx---, grant a second group (sales) r-x permissions

```
mohamedtorkey@torkey:~$ setfacl -m g:sales:rx dir1
mohamedtorkey@torkey:~$ getfacl dir1
# file: dir1
# owner: mohamedtorkey
# group: mohamedtorkey
user::rwx
group::rwx
group:sales:r-x
mask::rwx
other::---

mohamedtorkey@torkey:~$ S
```

14. create a file on that directory and grant read and write to a second group (sales)

```
mohamedtorkey@torkey:~$ setfacl -m g:sales:rw dir1/f1
mohamedtorkey@torkey:~$ getfacl dir1/f1
# file: dir1/f1
# owner: mohamedtorkey
# group: mohamedtorkey
user::rw-
group::r--
group:sales:rw-
mask::rw-
other::r--

mohamedtorkey@torkey:~$ ll dir1/
total 0
-rw-rw-r--+ 1 mohamedtorkey mohamedtorkey 0 Dec 15 16:48 f1
mohamedtorkey@torkey:~$
```

15. set the the owning group as the owning group of any newly created file in that directory.

```
mohamedtorkey@torkey:~$ sudo chmod g+s dir1
[sudo] password for mohamedtorkey:
mohamedtorkey@torkey:~$ ll -d dir1/
drwxrws---+ 1 mohamedtorkey mohamedtorkey 4 Dec 15 16:48 dir1/
mohamedtorkey@torkey:~$
mohamedtorkey@torkey:~$ touch dir1/f2
mohamedtorkey@torkey:~$ ll dir1/
total 0
-rw-rw-r--+ 1 mohamedtorkey mohamedtorkey 0 Dec 15 16:48 f1
-rw-r--r--. 1 mohamedtorkey mohamedtorkey 0 Dec 15 16:51 f2
mohamedtorkey@torkey:~$
```

16. Grand your colleagues a collective directory called /opt/research, where they can store generated research results. Only members of group profs and grads should be able to create new files in the directory, and new file should have the following properties:
    - the directory should be owned by root
    - new files should be group owned by group grads
    - group profs should automatically have read/write access to new files
    - group interns should automatically have read only access to new files
    - other users should not be able to access the directory and its contents at all.

```
mohamedtorkey@torkey:~$ ll -d /opt/research/
ls: cannot access '/opt/research/': No such file or directory
mohamedtorkey@torkey:~$ ls /opt/research/
ls: cannot access '/opt/research/': No such file or directory
mohamedtorkey@torkey:~$ ls /opt
mohamedtorkey@torkey:~$ mkdir /opt/research/
mkdir: cannot create directory ‘/opt/research/’: Permission denied
mohamedtorkey@torkey:~$ sudo mkdir /opt/research/
mohamedtorkey@torkey:~$ ll -d /opt/research/
drwxr-xr-x. 1 root root 0 Dec 15 16:35 /opt/research/
mohamedtorkey@torkey:~$ getfacl /opt/research/
getfacl: Removing leading '/' from absolute path names
# file: opt/research/
# owner: root
# group: root
user::rwx
group::r-x
other::r-x

mohamedtorkey@torkey:~$
```

17. Change your default SELinux mode to permissive and reboot.

```
#
SELINUX=permissive
# SELINUXTYPE= can take one of these three values:
#     targeted - Targeted processes are protected,
#     minimum - Modification of targeted policy. Only selected processes
#     mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

18. After reboot, verify the system is in permissive mode.

```
mohamedtorkey@torkey:~$ sestatus
SELinux status:                 enabled
SELinuxfs mount:                /sys/fs/selinux
SELinux root directory:         /etc/selinux
Loaded policy name:             targeted
Current mode:                   permissive
Mode from config file:          permissive
Policy MLS status:              enabled
Policy deny_unknown status:     allowed
Memory protection checking:     actual (secure)
Max kernel policy version:      33
mohamedtorkey@torkey:~$
```

19. Change the default SELinux mode to enforcing.

```
#
SELINUX=enforcing
# SELINUXTYPE= can take one of these three values:
#     targeted - Targeted processes are protected,
#     minimum - Modification of targeted policy. Only selected processes are
#     mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

20. Change the current SELinux mode to enforcing.

```
mohamedtorkey@torkey:~$ sudo setenforce enforcing
mohamedtorkey@torkey:~$ getenforce
Enforcing
mohamedtorkey@torkey:~$
```

21. Copy /etc/resolv.conf file to root's home directory.

```
root@torkey:~# cp /etc/resolv.conf  /root
root@torkey:~#
```

```
root@torkey:~# cp /etc/resolv.conf  /root
root@torkey:~# ls -l /root
total 4
-rw-r--r--. 1 root root 930 Dec 15 18:17 resolv.conf
root@torkey:~#
```

22. Observe the SELinux context of the intial /etc/resolv.conf

```
root@torkey:~# ls -Zl /etc/resolv.conf
-rw-r--r--. 1 root root unconfined_u:object_r:net_conf_t:s0 930 Dec 15 18:17 /et
c/resolv.conf
root@torkey:~#
```

23. Move resolv.conf from root's home directory to /etc/resolv.conf

```
root@torkey:~# mv /root/resolv.conf  /etc/resolv.conf
root@torkey:~#
```

24. Observe the SELinux of the newly copied /etc/resolv.conf

```
-rw-r--r--. 1 root root unconfined_u:object_r:admin_home_t:s0 930 Dec 15 18:35 /
etc/resolv.conf
root@torkey:~#
```

25. Restore the SELinux context of the newly positioned /etc/resolv.conf

```
root@torkey:~# restorecon /etc/resolv.conf
root@torkey:~#
```

26. Observe the SELinux context of the restored /etc/resolv.conf

```
root@torkey:~# ls -Zl /etc/resolv.conf
-rw-r--r--. 1 root root unconfined_u:object_r:net_conf_t:s0 930 Dec 15 18:35 /et
c/resolv.conf
root@torkey:~#
```

27. Configure OpenSSH to allow pulic key-based login credentials

```
# The default is to check both .ssh/authorized_keys and .ssh/authorized_keys2
# but this is overridden so installations will only check .ssh/authorized_keys
PubkeyAuthentication yes
AuthorizedKeysFile      .ssh/authorized_keys
```

28. Create an SSH key-pair

```
mohamedtorkey@torkey:~$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/mohamedtorkey/.ssh/id_rsa):
/home/mohamedtorkey/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/mohamedtorkey/.ssh/id_rsa
Your public key has been saved in /home/mohamedtorkey/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:5A8lOQY3YbAlHlJVcvHmDL8Luka40LzS6o3XXmxGPcg mohamedtorkey@torkey
The key's randomart image is:
+---[RSA 3072]----+
|     ..*oOo+.    |
|     o O = .     |
|      o * o o    |
|       + = O     |
|     o .S E *    |
|    . + .=   o   |
|     o =  B .    |
|    .o= o= . .   |
|   .++.o+.  .    |
+----[SHA256]-----+
mohamedtorkey@torkey:~$
```

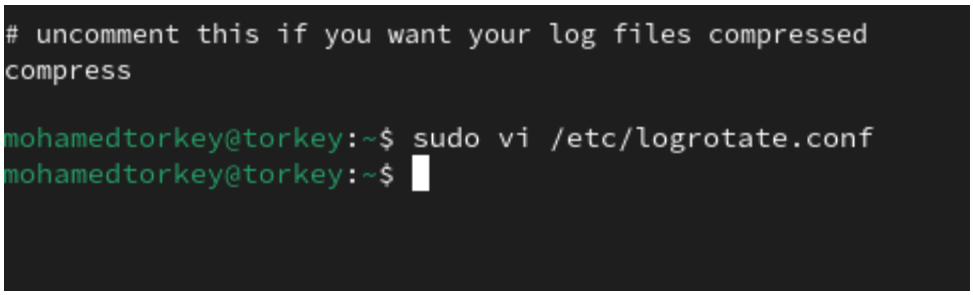
29. Configure to login without the need of a password.

```
mohamedtorkey@torkey:~$ ssh-copy-id mohamedtorkey@torkey
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter
 out any that are already installed
```

30. Configure SSH to prevent root logins.

```
# Authentication:
PermitRootLogin no
#LoginGraceTime 2m
#PermitRootLogin prohibit-password
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10
```

31. Configure logrotate default setting to compress log files when they are rotated.


uncomment this if you want your log files compressed
compress
mohamedtorkey@torkey:~$ sudo vi /etc/logrotate.conf
mohamedtorkey@torkey:~$