Advanced Admin 1 - Lab 2

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Part 1

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

```
mabotalb@fedora:~$ gnuplot
bash: gnuplot: command not found...
Packages providing this file are:
'gnuplot'
'gnuplot-minimal'
'gnuplot-wx'
mabotalb@fedora:~127$
```

18. Search for the plotting packages.

```
mabotalb@fedora:~$ yum search plotting
Fedora 39 - x86_64 - Updates                    1.4 MB/s |  26 MB     00:18
Last metadata expiration check: 0:00:22 ago on Sat 27 Jan 2024 07:26:43 PM EET.
===================== Name & Summary Matched: plotting ======================
kf5-kplotting.i686 : KDE Frameworks 5 Tier 1 addon for plotting
kf5-kplotting.x86_64 : KDE Frameworks 5 Tier 1 addon for plotting
kf5-kplotting-devel.i686 : Development files for kf5-kplotting
kf5-kplotting-devel.x86_64 : Development files for kf5-kplotting
python3-cartopy+plotting.x86_64 : Metapackage for python3-cartopy: plotting
                               : extras
python3-pybids+plotting.noarch : Metapackage for python3-pybids: plotting extras
========================= Summary Matched: plotting =========================
R-gplots.noarch : Various R Programming Tools for Plotting Data
gnuplot.x86_64 : A program for plotting mathematical expressions and data
gnuplot-minimal.x86_64 : Minimal version of program for plotting mathematical
                       : expressions and data
golang-github-aclements-gg-devel.noarch : Plotting package for Go
ocaml-plplot.x86_64 : Functions for scientific plotting with OCaml
opencv-plot.i686 : OpenCV module: 2D Plotting
opencv-plot.x86_64 : OpenCV module: 2D Plotting
oscilloscope.noarch : Generic graphical signal plotting tool
plplot-ada.i686 : Functions for scientific plotting with Ada
plplot-ada.x86_64 : Functions for scientific plotting with Ada
plplot-java.x86_64 : Functions for scientific plotting with Java
```

19. Find out more information about the gunuplot package.

```
mabotalb@fedora:~$ yum info gnuplot
Last metadata expiration check: 0:04:23 ago on Sat 27 Jan 2024 07:26:43 PM EET.
Available Packages
Name          : gnuplot
Version       : 5.4.8
Release       : 2.fc39
Architecture  : x86_64
Size          : 840 k
Source        : gnuplot-5.4.8-2.fc39.src.rpm
Repository    : 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.
              : Gnuplot can be used to plot functions and data points in both two
              : and three dimensions and in many different formats.
              :
              : Install gnuplot if you need a graphics package for scientific
              : data representation.
              :
              : This package provides a Qt based terminal version of gnuplot.

mabotalb@fedora:~$
```

20. Install the gnuplot package.

```
mabotalb@fedora:~$ sudo yum install gnuplot
[sudo] password for mabotalb:
Last metadata expiration check: 0:58:04 ago on Sat 27 Jan 2024 06:34:32 PM EET.
Dependencies resolved.
=================================================================================
 Package                  Architecture Version              Repository      Size
=================================================================================
Installing:
 gnuplot                  x86_64       5.4.8-2.fc39          fedora         840 k
Installing dependencies:
 dejavu-sans-fonts        noarch       2.37-20.fc39          updates        1.3 M
 gnuplot-common           x86_64       5.4.8-2.fc39          fedora         803 k
 libcerf                  x86_64       2.3-2.fc39            fedora          37 k

Transaction Summary
=================================================================================
Install  4 Packages

Total download size: 3.0 M
Installed size: 9.1 M
Is this ok [y/N]: y
Downloading Packages:
(1/4): libcerf-2.3-2.fc39.x86_64.rpm              119 kB/s |  37 kB     00:00
(2/4): gnuplot-5.4.8-2.fc39.x86_64.rpm            1.0 MB/s | 840 kB     00:00
```

21. Attempt to remove the gnuplot package, but say noHow many packages would be removed

```
mabotalb@fedora:~$ sudo yum remove gnuplot
[sudo] password for mabotalb:
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]: N
Operation aborted.
mabotalb@fedora:~1$
```

21. Attempt to remove the gunplot-common package but say no How many packages would be removed

```
mabotalb@fedora:~$ sudo yum remove gnuplot-common
Dependencies resolved.
==============================================================================
 Package                  Architecture Version              Repository      Size
==============================================================================
Removing:
 gnuplot-common           x86_64       5.4.8-2.fc39         @fedora         1.7 M
Removing dependent packages:
 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
 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]: N
Operation aborted.
mabotalb@fedora:~1$
```

Using rpm

22. List all installed packages in your system.

```
mabotalb@fedora:~$ rpm -qa
libgcc-13.2.1-3.fc39.x86_64
fonts-filesystem-2.0.5-12.fc39.noarch
google-noto-fonts-common-20230801-3.fc39.noarch
google-noto-sans-vf-fonts-20230801-3.fc39.noarch
abattis-cantarell-vf-fonts-0.301-10.fc39.noarch
linux-firmware-whence-20230919-1.fc39.noarch
tzdata-2023c-2.fc39.noarch
xkeyboard-config-2.39-2.fc39.noarch
hwdata-0.374-1.fc39.noarch
fedora-logos-38.1.0-2.fc39.noarch
default-fonts-core-sans-4.0-9.fc39.noarch
google-noto-sans-devanagari-vf-fonts-20230801-3.fc39.noarch
google-noto-sans-mono-vf-fonts-20230801-3.fc39.noarch
google-noto-serif-vf-fonts-20230801-3.fc39.noarch
liberation-fonts-common-2.1.5-7.fc39.noarch
liberation-mono-fonts-2.1.5-7.fc39.noarch
pcre2-syntax-10.42-1.fc39.2.noarch
mesa-filesystem-23.2.1-2.fc39.x86_64
libreport-filesystem-2.17.11-3.fc39.noarch
hyperv-daemons-license-0-0.42.20220731git.fc39.noarch
```

23. View the files in the initscripts package

```
mabotalb@fedora:~$ 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
/etc/rc.d/rc6.d
/etc/rc0.d
/etc/rc1.d
/etc/rc2.d
/etc/rc3.d
/etc/rc4.d
/etc/rc5.d
/etc/rc6.d
/etc/sysconfig/console
/etc/sysconfig/modules
```

24. Get general information about bash rpm.

```
mabotalb@fedora:~$ rpm -qi bash
Name         : bash
Version      : 5.2.15
Release      : 5.fc39
Architecture: x86_64
Install Date: Wed 01 Nov 2023 03:05:51 AM EET
Group        : Unspecified
Size         : 8571253
License      : GPL-3.0-or-later
Signature    : RSA/SHA256, Wed 19 Jul 2023 09:14:00 PM EEST, Key ID 75cf5ac418b8e
74c
Source RPM   : bash-5.2.15-5.fc39.src.rpm
Build Date   : Wed 19 Jul 2023 05:33:18 PM EEST
Build Host   : buildvm-x86-22.iad2.fedoraproject.org
Packager     : Fedora Project
Vendor       : Fedora Project
URL          : https://www.gnu.org/software/bash
Bug URL      : https://bugz.fedoraproject.org/bash
Summary      : The GNU Bourne Again shell
Description :
The GNU Bourne Again shell (Bash) is a shell or command language
```

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

```
mabotalb@fedora:~$ rpm -V pam
..?......  c /etc/security/opasswd
..?......    /usr/sbin/unix_update
mabotalb@fedora:~1$
```

26. Which installed packages have gnome in their names?

```
mabotalb@fedora:~$ rpm -qa | grep gnome
gnome-control-center-filesystem-45.0-2.fc39.noarch
fedora-chromium-config-gnome-3.0-2.fc39.noarch
f39-backgrounds-gnome-39.0.4-1.fc39.noarch
gnome-menus-3.36.0-9.fc39.x86_64
pinentry-gnome3-1.2.1-4.fc39.x86_64
gnome-video-effects-0.6.0-2.fc39.noarch
gnome-remote-desktop-45.rc-1.fc39.x86_64
gnome-desktop3-44.0-7.fc39.x86_64
gnome-desktop4-44.0-7.fc39.x86_64
gnome-online-accounts-3.48.0-2.fc39.x86_64
gnome-settings-daemon-45.0-1.fc39.x86_64
gnome-session-45.0-3.fc39.x86_64
gnome-abrt-1.4.2-6.fc39.x86_64
xdg-desktop-portal-gnome-45.0-1.fc39.x86_64
gnome-bluetooth-libs-42.6-1.fc39.x86_64
gnome-bluetooth-42.6-1.fc39.x86_64
gnome-keyring-42.1-5.fc39.x86_64
gnome-autoar-0.4.4-2.fc39.x86_64
gnome-terminal-3.48.1-2.fc39.x86_64
```

27. Install any uninstalled package from RH Enterprise Linux cds

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

```
mabotalb@fedora:~$ sudo yum install krita
Last metadata expiration check: 1:24:42 ago on Sat 27 Jan 2024 06:34:32 PM EET.
Dependencies resolved.
================================================================================
 Package              Arch         Version              Repository      Size
================================================================================
Installing:
 krita                x86_64       5.2.2-1.fc39                updates      68 M
Installing dependencies:
 OpenColorIO          x86_64       2.2.1-5.fc39                fedora      1.9 M
 breeze-icon-theme    noarch       5.113.0-1.fc39              updates     7.6 M
 freeglut             x86_64       3.4.0-4.fc39                fedora      154 k
 gsl                  x86_64       2.7.1-5.fc39                fedora      1.1 M
 kde-filesystem       x86_64       4-70.fc39                   fedora       47 k
 kde-settings         noarch       39.1-1.fc39                 updates      40 k
 kf5-filesystem       x86_64       5.113.0-1.fc39              updates      12 k
 kf5-kcompletion      x86_64       5.113.0-1.fc39              updates     156 k
 kf5-kconfig-core     x86_64       5.113.0-1.fc39              updates     354 k
 kf5-kconfig-gui      x86_64       5.113.0-1.fc39              updates      56 k
 kf5-kcoreaddons      x86_64       5.113.0-1.fc39              updates     496 k
```

29. Create the file /etc/yum.repos.d/cdrom.repo to enable install from the iso from the iso of Red Hat.

```
mabotalb@fedora:~$ cd /etc/yum.repos.d/
mabotalb@fedora:/etc/yum.repos.d$ ls
_copr:copr.fedorainfracloud.org:phracek:PyCharm.repo
fedora-cisco-openh264.repo
fedora.repo
fedora-updates.repo
fedora-updates-testing.repo
google-chrome.repo
rpmfusion-nonfree-nvidia-driver.repo
rpmfusion-nonfree-steam.repo
mabotalb@fedora:/etc/yum.repos.d$ sudo nano cdrom.repo
mabotalb@fedora:/etc/yum.repos.d$
```

```
  GNU nano 7.2                    cdrom.repo                        Modified
[cdrom]
name=Red Hat Enterprise Linux
baseurl=file:///mnt/cdrom
enabled=1
gpgcheck=1
```
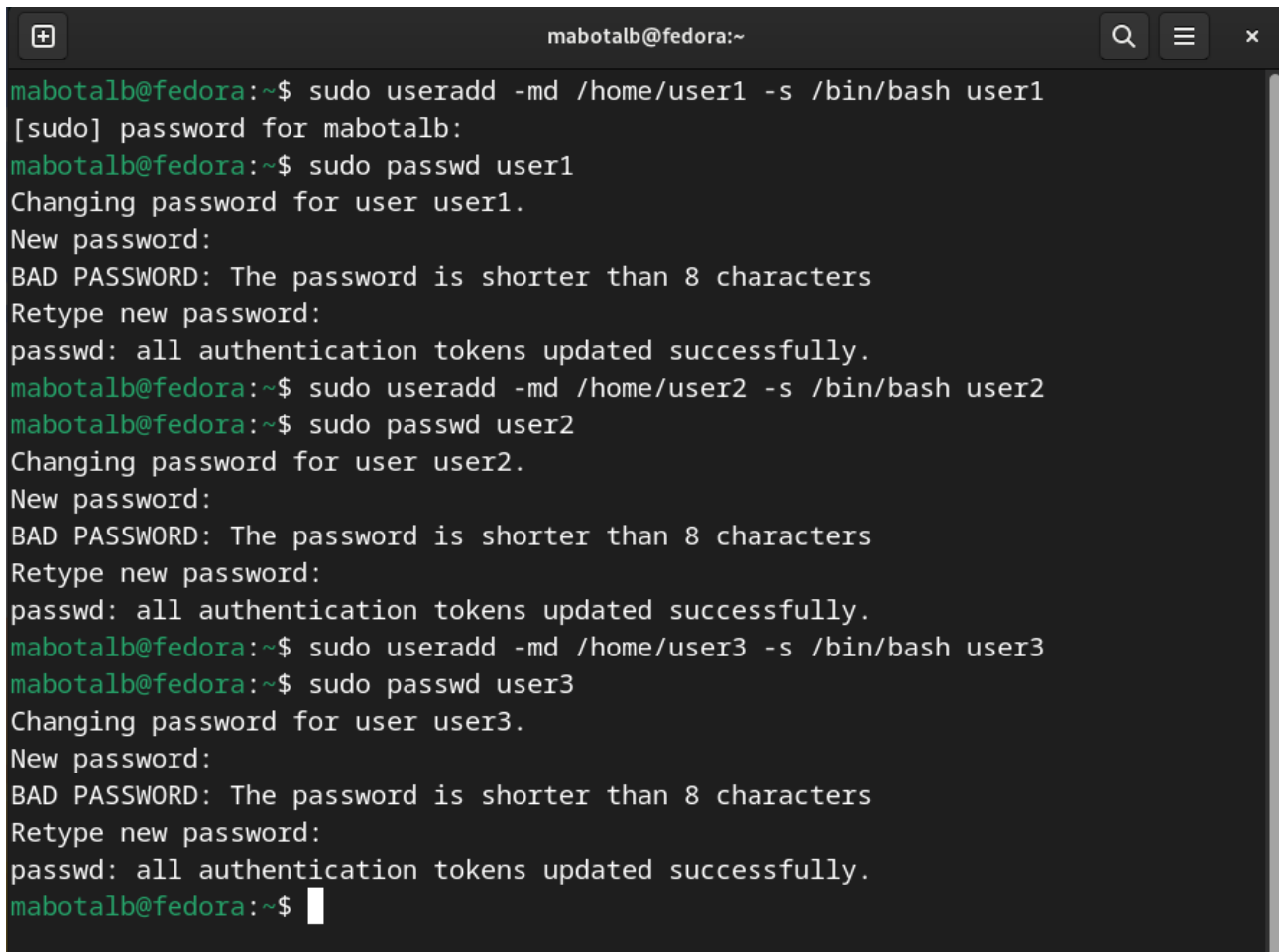
30. Try to install any package from the new repository.

```
mabotalb@fedora:/etc/yum.repos.d$ sudo yum --disablerepo=* --enablerepo=cdrom in
stall git
Red Hat Enterprise Linux                    0.0  B/s |   0 B      00:00
Errors during downloading metadata for repository 'cdrom':
  - Curl error (37): Couldn't read a file:// file for file:///mnt/cdrom/repodata
/repomd.xml [Couldn't open file /mnt/cdrom/repodata/repomd.xml]
Error: Failed to download metadata for repo 'cdrom': Cannot download repomd.xml:
 Cannot download repodata/repomd.xml: All mirrors were tried
Ignoring repositories: cdrom
Package git-2.41.0-2.fc39.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
mabotalb@fedora:/etc/yum.repos.d$
```

Part 2

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.

```
mabotalb@fedora:~$ sudo useradd -md /home/user1 -s /bin/bash user1
[sudo] password for mabotalb:
mabotalb@fedora:~$ sudo passwd user1
Changing password for user user1.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
mabotalb@fedora:~$ sudo useradd -md /home/user2 -s /bin/bash user2
mabotalb@fedora:~$ sudo passwd user2
Changing password for user user2.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
mabotalb@fedora:~$ sudo useradd -md /home/user3 -s /bin/bash user3
mabotalb@fedora:~$ sudo passwd user3
Changing password for user user3.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
mabotalb@fedora:~$
```

```
mabotalb@fedora:~$ sudo useradd -md /home/user4 -s /bin/bash user4
mabotalb@fedora:~$ sudo passwd user4
Changing password for user user4.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
mabotalb@fedora:~$ sudo useradd -md /home/user5 -s /bin/bash user5
mabotalb@fedora:~$ sudo passwd user5
Changing password for user user5.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
mabotalb@fedora:~$ sudo useradd -md /home/user6 -s /bin/bash user6
mabotalb@fedora:~$ sudo passwd user6
Changing password for user user6.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
mabotalb@fedora:~$ sudo useradd -md /home/user7 -s /bin/bash user7
mabotalb@fedora:~$ sudo passwd user7
Changing password for user user7.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
mabotalb@fedora:~$
```

```
mabotalb@fedora:~$ tail -7 /etc/passwd
user1:x:1001:1001::/home/user1:/bin/bash
user2:x:1002:1002::/home/user2:/bin/bash
user3:x:1003:1003::/home/user3:/bin/bash
user4:x:1004:1004::/home/user4:/bin/bash
user5:x:1005:1005::/home/user5:/bin/bash
user6:x:1006:1006::/home/user6:/bin/bash
user7:x:1007:1007::/home/user7:/bin/bash
mabotalb@fedora:~$
```

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?

=> to avoid conflicts, ensure consistency across multiple systems and allows you to choose GID values that are meaningful or easy to remember.

```
⊞                          mabotalb@fedora:~                    Q  ≡   ×
mabotalb@fedora:~$ sudo groupadd -g 10000 sales
[sudo] password for mabotalb:
mabotalb@fedora:~$ sudo groupadd -g 10001 hr
mabotalb@fedora:~$ sudo groupadd -g 10002 web
mabotalb@fedora:~$
```

```
⊞                          mabotalb@fedora:~                    Q  ≡   ×
mabotalb@fedora:~$ tail -5 /etc/group
user6:x:1006:
user7:x:1007:
sales:x:10000:
hr:x:10001:
web:x:10002:
mabotalb@fedora:~$ ▌
```

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

```
⊞                          mabotalb@fedora:~                    Q  ≡   ×
mabotalb@fedora:~$ sudo usermod -aG sales user1
mabotalb@fedora:~$ sudo usermod -aG sales user2
mabotalb@fedora:~$ sudo usermod -aG hr user3
mabotalb@fedora:~$ sudo usermod -aG hr user4
mabotalb@fedora:~$ sudo usermod -aG web user5
mabotalb@fedora:~$ sudo usermod -aG web user6
mabotalb@fedora:~$ sudo usermod -aG sales,hr,web user7
mabotalb@fedora:~$
```

```
mabotalb@fedora:~$ tail -5 /etc/group
user6:x:1006:
user7:x:1007:
sales:x:10000:user1,user2,user7
hr:x:10001:user3,user4,user7
web:x:10002:user5,user6,user7
mabotalb@fedora:~$
```

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?

```
mabotalb@fedora:~$ id user1
uid=1001(user1) gid=1001(user1) groups=1001(user1),10000(sales)
mabotalb@fedora:~$ id user2
uid=1002(user2) gid=1002(user2) groups=1002(user2),10000(sales)
mabotalb@fedora:~$ id user3
uid=1003(user3) gid=1003(user3) groups=1003(user3),10001(hr)
mabotalb@fedora:~$ id user4
uid=1004(user4) gid=1004(user4) groups=1004(user4),10001(hr)
mabotalb@fedora:~$ id user5
uid=1005(user5) gid=1005(user5) groups=1005(user5),10002(web)
mabotalb@fedora:~$ id user6
uid=1006(user6) gid=1006(user6) groups=1006(user6),10002(web)
mabotalb@fedora:~$ id user7
uid=1007(user7) gid=1007(user7) groups=1007(user7),10000(sales),10001(hr),10002(
web)
mabotalb@fedora:~$ 
```

Another Method => tail /etc/group

```
mabotalb@fedora:~$ tail /etc/group
user1:x:1001:
user2:x:1002:
user3:x:1003:
user4:x:1004:
user5:x:1005:
user6:x:1006:
user7:x:1007:
sales:x:10000:user1,user2,user7
hr:x:10001:user3,user4,user7
web:x:10002:user5,user6,user7
mabotalb@fedora:~$ 
```

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

```
mabotalb@fedora:~$ sudo mkdir -p /depts/sales /depts/hr /depts/web
mabotalb@fedora:~$ ls /
afs   boot    dev   home   lib64        media   opt    root   sbin   sys   usr
bin   depts   etc   lib    lost+found   mnt     proc   run    srv    tmp   var
mabotalb@fedora:~$ ls /depts
hr   sales   web
mabotalb@fedora:~$ 
```

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

```
mabotalb@fedora:~$ sudo chgrp sales /depts/sales
mabotalb@fedora:~$ sudo chgrp hr /depts/hr
mabotalb@fedora:~$ sudo chgrp web /depts/web
mabotalb@fedora:~$ ls -l /depts/
total 0
drwxr-xr-x. 1 root hr      0 Jan 27 22:30 hr
drwxr-xr-x. 1 root sales 0 Jan 27 22:30 sales
drwxr-xr-x. 1 root web     0 Jan 27 22:30 web
mabotalb@fedora:~$ 
```

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

```
mabotalb@fedora:~$ sudo chmod 755 /depts
mabotalb@fedora:~$ sudo 770 /depts/sales/
sudo: 770: command not found
mabotalb@fedora:~1$ sudo chmod 770 /depts/sales/
mabotalb@fedora:~$ sudo chmod 770 /depts/hr/
mabotalb@fedora:~$ sudo chmod 770 /depts/web/
mabotalb@fedora:~$ ls -l /depts/
total 0
drwxrwx---. 1 root hr      0 Jan 27 22:30 hr
drwxrwx---. 1 root sales 0 Jan 27 22:30 sales
drwxrwx---. 1 root web     0 Jan 27 22:30 web
mabotalb@fedora:~$ 
```

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

```
mabotalb@fedora:~$ sudo chmod g+s /depts/
mabotalb@fedora:~$ sudo chmod g+s /depts/sales/
mabotalb@fedora:~$ sudo chmod g+s /depts/hr/
mabotalb@fedora:~$ sudo chmod g+s /depts/web/
mabotalb@fedora:~$ ls -l /depts/
total 0
drwxrws---. 1 root hr    0 Jan 27 22:30 hr
drwxrws---. 1 root sales 0 Jan 27 22:30 sales
drwxrws---. 1 root web   0 Jan 27 22:30 web
mabotalb@fedora:~$
```

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?

=> Succeeded:
touch /depts/sales/user2.txt
user2 is member of the group and has permissions

=> Failed:
touch /depts/hr/ user2.txt
touch /depts/web/ user2.txt
user2 isn't member of the group and doesn't have permissions

```
mabotalb@fedora:~$ sudo chmod g+s /depts/
mabotalb@fedora:~$ sudo chmod g+s /depts/sales/
mabotalb@fedora:~$ sudo chmod g+s /depts/hr/
mabotalb@fedora:~$ sudo chmod g+s /depts/web/
mabotalb@fedora:~$ ls -l /depts/
total 0
drwxrws---. 1 root hr     0 Jan 27 22:30 hr
drwxrws---. 1 root sales  0 Jan 27 22:30 sales
drwxrws---. 1 root web    0 Jan 27 22:30 web
mabotalb@fedora:~$
```

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.

```
mabotalb@fedora:~$ sudo visudo
mabotalb@fedora:~$
```

```
  GNU nano 7.2                    /etc/sudoers.tmp
# Allow user3 and user4 to use /bin/mount and /bin/umount
user3, user4 ALL=(ALL:ALL) /bin/mount, /bin/umount

# Allow user5 to use fdisk
user5 ALL=(ALL:ALL) /sbin/fdisk

## Sudoers allows particular users to run various commands as
## the root user, without needing the root password.
##
## Examples are provided at the bottom of the file for collections
## of related commands, which can then be delegated out to particular
## users or groups.
##
## This file must be edited with the 'visudo' command.
```

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

```
root@fedora:~# su user3
user3@fedora:/root$ sudo unmount /boot
[sudo] password for user3:
Sorry, try again.
[sudo] password for user3:
sudo: unmount: command not found
user3@fedora:/root1$ sudo unmount /boot
[sudo] password for user3:
sudo: unmount: command not found
user3@fedora:/root1$
```

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

```
user3@fedora:/root$ su user4
Password:
user4@fedora:/root$ sudo mount /boot

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

For security reasons, the password you type will not be visible.

[sudo] password for user4:
user4@fedora:/root$ sudo fdisk -l
Sorry, user user4 is not allowed to execute '/usr/sbin/fdisk -l' as root on fedo
ra.
user4@fedora:/root1$
```
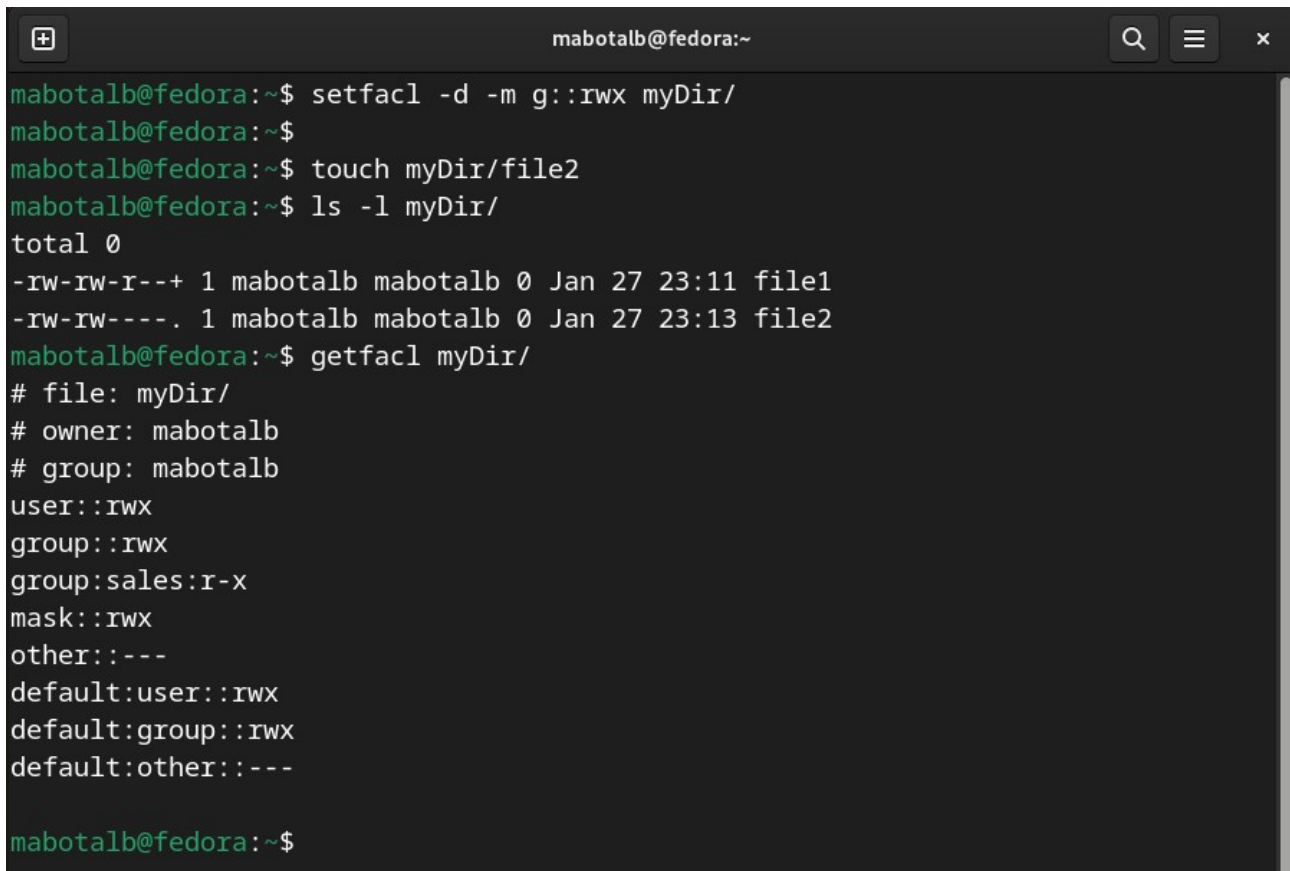
13. Create a directory with permissions rwxrwx---, grant a second group (sales) r-x permissions

```
mabotalb@fedora:~$ mkdir myDir
mabotalb@fedora:~$ chmod 770 myDir/
mabotalb@fedora:~$
mabotalb@fedora:~$ setfacl -m g:sales:r-x myDir/
mabotalb@fedora:~$ getfacl myDir/
# file: myDir/
# owner: mabotalb
# group: mabotalb
user::rwx
group::rwx
group:sales:r-x
mask::rwx
other::---

mabotalb@fedora:~$
```

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

```
mabotalb@fedora:~$ touch myDir/file1
mabotalb@fedora:~$ setfacl -m g:sales:rw myDir/file1
mabotalb@fedora:~$ getfact myDir/file1
bash: getfact: command not found...
mabotalb@fedora:~127$ getfacl myDir/file1
# file: myDir/file1
# owner: mabotalb
# group: mabotalb
user::rw-
group::r--
group:sales:rw-
mask::rw-
other::r--

mabotalb@fedora:~$
```

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

```
mabotalb@fedora:~$ setfacl -d -m g::rwx myDir/
mabotalb@fedora:~$
mabotalb@fedora:~$ touch myDir/file2
mabotalb@fedora:~$ ls -l myDir/
total 0
-rw-rw-r--+ 1 mabotalb mabotalb 0 Jan 27 23:11 file1
-rw-rw----. 1 mabotalb mabotalb 0 Jan 27 23:13 file2
mabotalb@fedora:~$ getfacl myDir/
# file: myDir/
# owner: mabotalb
# group: mabotalb
user::rwx
group::rwx
group:sales:r-x
mask::rwx
other::---
default:user::rwx
default:group::rwx
default:other::---

mabotalb@fedora:~$
```

16. Grand your colleagues a collective directory called /opt/research, where they can store generated research results.

```
root@fedora:~# mkdir /opt/research
root@fedora:~# chmod 700 /opt/research/
root@fedora:~# chown root:root /opt/research/
root@fedora:~# chmod g+s /opt/research/
root@fedora:~# chown :grads /opt/research/
root@fedora:~# touch /opt/research/file
root@fedora:~# ls -l /opt/research/
total 0
-rw-r--r--. 1 root grads 0 Jan 27 23:26 file
root@fedora:~# sudo setfacl -m g:profs:rw- /opt/research/
root@fedora:~# sudo setfacl -m g:interns:r-- /opt/research/
root@fedora:~# setfacl -m g:grads:rwx /opt/research/
root@fedora:~# getfacl /opt/research/
getfacl: Removing leading '/' from absolute path names
# file: opt/research/
# owner: root
# group: grads
# flags: -s-
user::rwx
group::---
group:grads:rwx
group:profs:rw-
group:interns:r--
mask::rwx
other::---

root@fedora:~#
```

```
mabotalb@fedora:~$ ls /opt/research/
ls: cannot open directory '/opt/research/': Permission denied
mabotalb@fedora:~2$ sudo ls /opt/research/
[sudo] password for mabotalb:
file
mabotalb@fedora:~$
```