



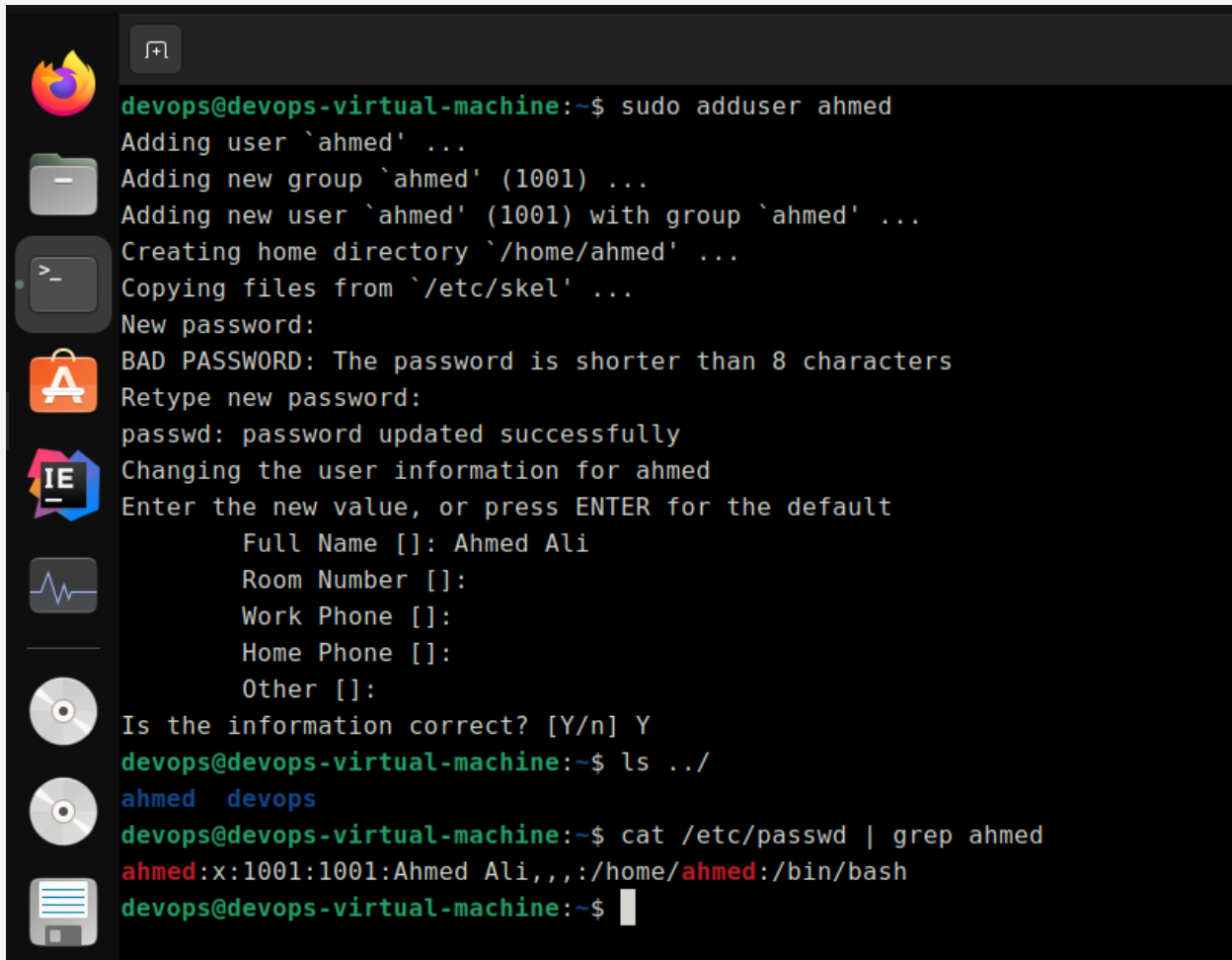
# **LINUX ADMIN LAB-2**

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## 1. Create a user account with the following attribute

- **username: ahmed**
- **Full Name/comment: ahmed ali**
- **Password: ahmed**



```
devops@devops-virtual-machine:~$ sudo adduser ahmed
Adding user `ahmed' ...
Adding new group `ahmed' (1001) ...
Adding new user `ahmed' (1001) with group `ahmed' ...
Creating home directory `/home/ahmed' ...
Copying files from `/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for ahmed
Enter the new value, or press ENTER for the default
    Full Name []: Ahmed Ali
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] Y
devops@devops-virtual-machine:~$ ls ../
ahmed  devops
devops@devops-virtual-machine:~$ cat /etc/passwd | grep ahmed
ahmed:x:1001:1001:Ahmed Ali,,,:/home/ahmed:/bin/bash
devops@devops-virtual-machine:~$
```

Using **adduser** creates everything by default in an interactive, user-friendly way, and the shell directory is **/bin/bash** and it gave me the option to create the password.

## 2. Create a user account with the following attribute

- **Username: baduser**
- **Full name/comment: Bad User**
- **Password: baduser**

```
devops@devops-virtual-machine:~$ sudo useradd -c "Bad User" baduser
devops@devops-virtual-machine:~$ ls -al ../
total 16
drwxr-xr-x  4 root    root    4096 Apr 12 13:47 .
drwxr-xr-x 20 root    root    4096 Nov  1 20:36 ..
drwxr-x---  2 ahmed   ahmed   4096 Apr 12 13:47 ahmed
drwxr-x--- 27 devops  devops  4096 Apr 12 02:55 devops
devops@devops-virtual-machine:~$ cat /etc/passwd | grep baduser
baduser:x:1002:1002:Bad User:/home/baduser:/bin/sh
devops@devops-virtual-machine:~$
```

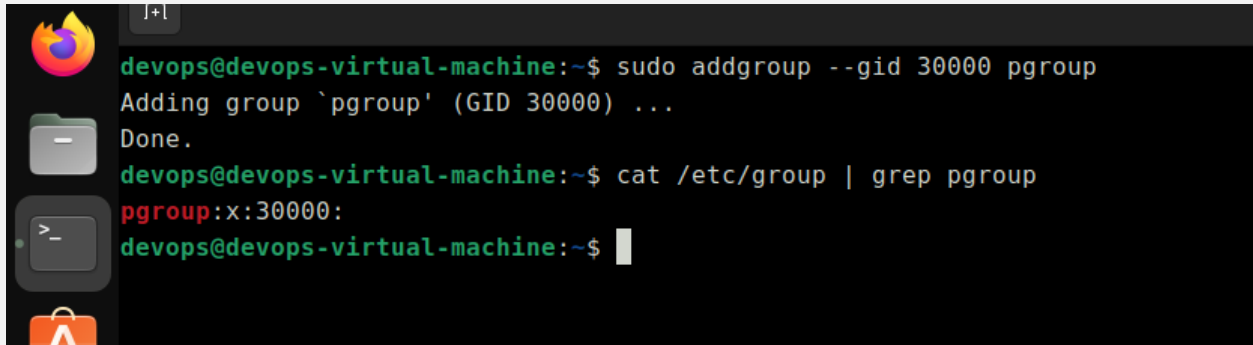
Here **useradd** didn't create the home directory, it didn't show me what's happening behind the scenes, and the shell directory is **/bin/sh**, and no option for password creation.

To overcome this we can use more options and then set the password:

```
devops@devops-virtual-machine:~$ sudo deluser baduser
Removing user `baduser' ...
Warning: group `baduser' has no more members.
Done.
devops@devops-virtual-machine:~$ sudo useradd -c "Bad User" -md /home/baduser -s /bin/bash baduser
devops@devops-virtual-machine:~$ ls ../
ahmed baduser devops
devops@devops-virtual-machine:~$ cat /etc/passwd | grep baduser
baduser:x:1002:1002:Bad User:/home/baduser:/bin/bash
devops@devops-virtual-machine:~$
```

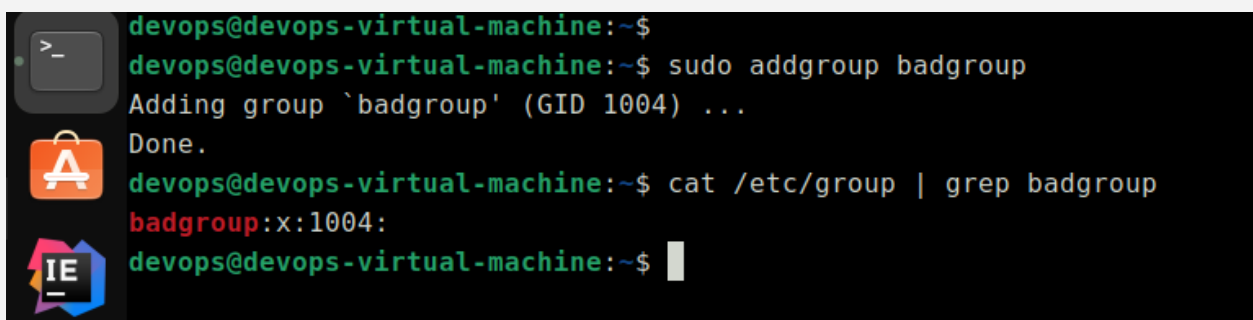
```
devops@devops-virtual-machine:~$ sudo passwd baduser
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
devops@devops-virtual-machine:~$
```

### **3. Create a supplementary (Secondary) group called pgroup with group ID of 30000**



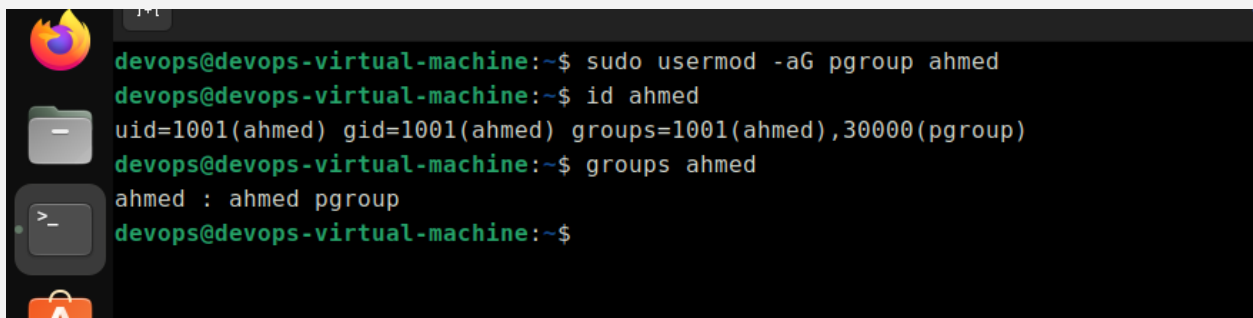
```
devops@devops-virtual-machine:~$ sudo addgroup --gid 30000 pgroup
Adding group `pgroup' (GID 30000) ...
Done.
devops@devops-virtual-machine:~$ cat /etc/group | grep pgroup
pgroup:x:30000:
devops@devops-virtual-machine:~$
```

#### **4. Create a supplementary group called badgroup**



```
devops@devops-virtual-machine:~$ sudo addgroup badgroup
Adding group `badgroup' (GID 1004) ...
Done.
devops@devops-virtual-machine:~$ cat /etc/group | grep badgroup
badgroup:x:1004:
devops@devops-virtual-machine:~$
```

#### **5. Add ahmed user to the pgroup group as a supplementary group**



```
devops@devops-virtual-machine:~$ sudo usermod -aG pgroup ahmed
devops@devops-virtual-machine:~$ id ahmed
uid=1001(ahmed) gid=1001(ahmed) groups=1001(ahmed),30000(pgroup)
devops@devops-virtual-machine:~$ groups ahmed
ahmed : ahmed pgroup
devops@devops-virtual-machine:~$
```

#### **6. Modify the password of ahmed's account to password**

```
devops@devops-virtual-machine:~$ sudo passwd ahmed
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
passwd: password updated successfully
devops@devops-virtual-machine:~$
```

## **7. Modify ahmed's account so the password expires after 30 days**

You can verify that the password expiration has been set with the `-l` option:

```
devops@devops-virtual-machine:~$ sudo chage -M 30 ahmed
devops@devops-virtual-machine:~$ sudo chage -l ahmed
Last password change           : 2023 , 11 أبر
Password expires                : 2023 , 11 ماي
Password inactive               : never
Account expires                 : never
Minimum number of days between password change : 0
Maximum number of days between password change : 30
Number of days of warning before password expires : 7
devops@devops-virtual-machine:~$
```

## **8. Lock bad user account so he can't log in**

To view a list of locked users, you can use the `passwd` command with the `-S` option.

```
devops@devops-virtual-machine:~$ man usermod
devops@devops-virtual-machine:~$ sudo usermod -L baduser
devops@devops-virtual-machine:~$ sudo passwd -S baduser
baduser L 04/12/2023 0 99999 7 -1
devops@devops-virtual-machine:~$ ### L indicates Locked ###
devops@devops-virtual-machine:~$ su - baduser
Password:
su: Authentication failure
devops@devops-virtual-machine:~$
```

## **9. Delete bad user account**

```

devops@devops-virtual-machine:~$ ls ../
ahmed baduser devops
devops@devops-virtual-machine:~$ sudo userdel -rf baduser
userdel: user baduser is currently used by process 3864
userdel: baduser mail spool (/var/mail/baduser) not found
devops@devops-virtual-machine:~$ cat /etc/passwd | grep baduser
devops@devops-virtual-machine:~$ ls ../
ahmed devops
devops@devops-virtual-machine:~$ ### r option to delete home directory ###
devops@devops-virtual-machine:~$ ### f option to force delete ###
devops@devops-virtual-machine:~$ id baduser
id: 'baduser': no such user
devops@devops-virtual-machine:~$

```

## **10. Delete the supplementary group called badgroup.**

```

devops@devops-virtual-machine:~$ sudo delgroup badgroup
Removing group `badgroup' ...
Done.
devops@devops-virtual-machine:~$ cat /etc/group | grep badgroup
devops@devops-virtual-machine:~$

```

### **Important note:-**

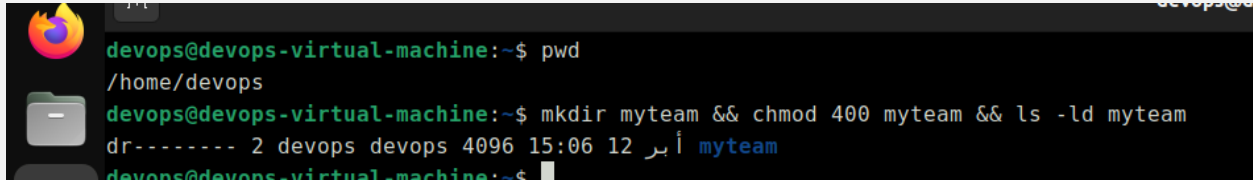
I used **adduser**, **addgroup**, **delgroup** because it's easier to deal with and more interactive as it shows confirmation messages for what's happening behind the scenes.

When I was deleting a user, I used **userdel** because it's more flexible with its option **-rf** which I needed in that case.

This shows the difference between the two methods, the first one (**adduser**) is easier and does a lot of work for you, but the second one (**useradd**) is far more flexible with a lot of options to manage.

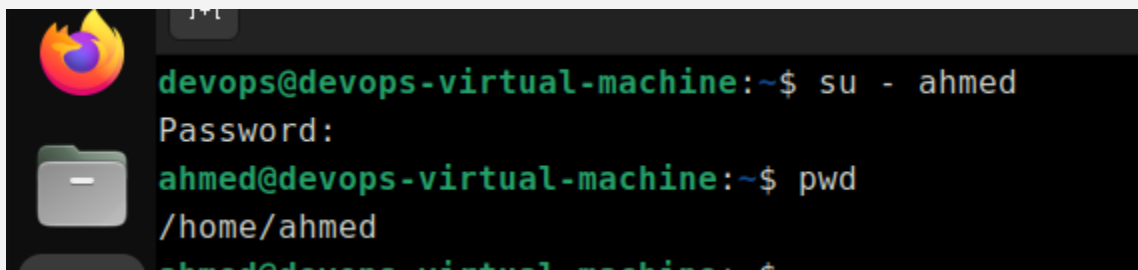
**Finally , we should use the second method (useradd) in bash scripting for automation and configuration as it's easier to tune and configure.**

**13. Create a folder called myteam in your home directory and change its permissions to read only for the owner.**



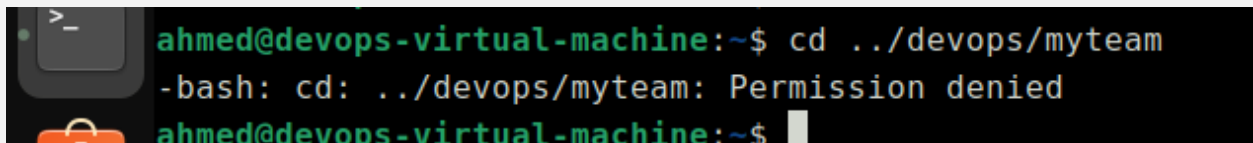
```
devops@devops-virtual-machine:~$ pwd
/home/devops
devops@devops-virtual-machine:~$ mkdir myteam && chmod 400 myteam && ls -ld myteam
dr----- 2 devops devops 4096 15:06 12 أبر myteam
devops@devops-virtual-machine:~$
```

**14. Log out and log in by another user**



```
devops@devops-virtual-machine:~$ su - ahmed
Password:
ahmed@devops-virtual-machine:~$ pwd
/home/ahmed
ahmed@devops-virtual-machine:~$
```

**15. Try to access (by cd command) the folder (myteam)**



```
ahmed@devops-virtual-machine:~$ cd ../devops/myteam
-bash: cd: ../devops/myteam: Permission denied
ahmed@devops-virtual-machine:~$
```

## 16. Using the command Line

- **Change the permissions of oldpasswd file to give owner read and write permissions and for group write and execute and execute only for the others (using chmod in 2 different ways)**

Using symbolic mode:

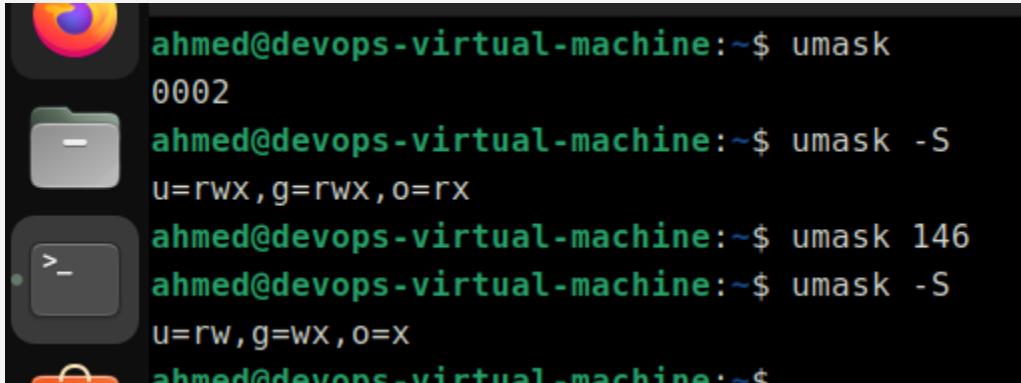
```
devops@devops-virtual-machine:~/practice$ pwd
/home/devops/practice
devops@devops-virtual-machine:~/practice$ touch oldpasswd
devops@devops-virtual-machine:~/practice$ ls -l oldpasswd
-rw-rw-r-- 1 devops devops 0 02:10 12 أبر oldpasswd
devops@devops-virtual-machine:~/practice$ chmod u=rw,g=wx,o=x oldpasswd
devops@devops-virtual-machine:~/practice$ ls -l oldpasswd
-rw--wx--x 1 devops devops 0 02:10 12 أبر oldpasswd
devops@devops-virtual-machine:~/practice$
```

Using numeric mode:

```
devops@devops-virtual-machine:~/practice$ chmod 000 oldpasswd
devops@devops-virtual-machine:~/practice$ ls -l oldpasswd
----- 1 devops devops 0 02:10 12 أبر oldpasswd
devops@devops-virtual-machine:~/practice$ chmod 631 oldpasswd
devops@devops-virtual-machine:~/practice$ ls -l oldpasswd
-rw--wx--x 1 devops devops 0 02:10 12 أبر oldpasswd
devops@devops-virtual-machine:~/practice$
```



- **Change your default permissions to be as above.**

A terminal window with a dark background and light green text. On the left side, there are three icons: a colorful swirl, a folder icon, and a terminal icon. The terminal text shows a user named 'ahmed' at a machine named 'devops-virtual-machine' in the home directory. The commands and their outputs are: 1. 'umask' returns '0002'. 2. 'umask -S' returns 'u=rwx,g=rwx,o=rx'. 3. 'umask 146' returns nothing. 4. 'umask -S' returns 'u=rw,g=wx,o=x'.

```
ahmed@devops-virtual-machine:~$ umask
0002
ahmed@devops-virtual-machine:~$ umask -S
u=rwx,g=rwx,o=rx
ahmed@devops-virtual-machine:~$ umask 146
ahmed@devops-virtual-machine:~$ umask -S
u=rw,g=wx,o=x
ahmed@devops-virtual-machine:~$
```

- **What is the maximum permission a file can have, by default when it is just created? And what is that for directory?**

The maximum permission a **file** can have is **666**, minus the umask value **002** = **664**

The maximum permission a **directory** can have is **777**, minus the umask value **002** = **775**

My default umask value is 002; it may differ for others.

The reason is that directories need the execute permission in order to be searchable.

Without the execute permission, users would not be able to enter the directory or access its contents.

- **Change your default permissions to be no permission to everyone then create a directory and a file**

```

ahmed@devops-virtual-machine:~$ umask -S
u=rw,g=wx,o=x
ahmed@devops-virtual-machine:~$ umask 777
ahmed@devops-virtual-machine:~$ umask -S
u=,g=,o=
ahmed@devops-virtual-machine:~$ mkdir no-perm && touch no-perm.txt && ls -ld no-perm && ls -l no-perm.txt
d----- 2 ahmed ahmed 4096 15:22 12 أيار no-perm
----- 1 ahmed ahmed 0 15:22 12 أيار no-perm.txt
ahmed@devops-virtual-machine:~$

```

## **17. What are the minimum permission needed for:**

- **Copy a directory (permission for source directory and permissions for target parent directory)**

**Read** access to the source directory.

**Write** access to the target parent directory.

- **Copy a file (permission for source file and permission for target parent directory)**

**Read** access to the source file.

**Write** access to the target parent directory.

- **Delete a file**

**Write** permission on the parent directory.

**Read and execute** permissions on the file.

- **Change to a directory**

**Execute** permission on the directory.

- **List a directory content (ls command)**

**Read and Execute** permission on the directory.

- **View a file content (more/cat command)**

**Read** permission on the file.

- **Modify a file content**

**Write** permission on the file.

## **18. Create a file with permission 444. Try to edit in it and to remove it? Note what happened.**

```
devops@devops-virtual-machine:~/practice$ touch file-444.txt && chmod 444 file-444.txt && ls -l file-444.txt
-r--r--r-- 1 devops devops 0 02:52 12 أبريل file-444.txt
devops@devops-virtual-machine:~/practice$ vim file-444.txt
devops@devops-virtual-machine:~/practice$
```

```
devops@devops-virtual-machine: ~/practice
warning! changing a read only file..
~
~
~
~
E45: 'readonly' option is set (add ! to override) 1,3
```

```
devops@devops-virtual-machine:~/practice$ rm file-444.txt
rm: remove write-protected regular empty file 'file-444.txt'? n
devops@devops-virtual-machine:~/practice$ ls file-444.txt
file-444.txt
devops@devops-virtual-machine:~/practice$ rm file-444.txt
rm: remove write-protected regular empty file 'file-444.txt'? y
devops@devops-virtual-machine:~/practice$ ls file-444.txt
ls: cannot access 'file-444.txt': No such file or directory
devops@devops-virtual-machine:~/practice$
```

Try to Edit : Displayed a warning because it's a read only file.

Try to Remove : Prompt a confirmation to remove a protected empty file.

### **19. What is the difference between the “x” permission for a file and for a directory?**

For a file it controls whether the file can be **executed** as a program or script.  
For a directory it controls whether you can enter the directory and **access** its contents.