Day 3 – Phase 3: User, Group, and Permissions Management

1)


```
aya@aya-VirtualBox:~/Desktop$ cd ~
aya@aya-VirtualBox:~$ sudo groupadd iot_group
[sudo] password for aya:
aya@aya-VirtualBox:~$ gentent group iot_group
Command 'gentent' not found, did you mean:
  command 'getent' from deb libc-bin (2.35-0ubuntu3.10)
  command 'gentest' from deb samba-testsuite (2:4.15.13+dfsg-0ubuntu1.7)
Try: sudo apt install <deb name>
aya@aya-VirtualBox:~$ sudo gpasswd -a aya iot_group
Adding user aya to group iot_group
```

2)


```
aya@aya-VirtualBox:~/Desktop$ cd ~
aya@aya-VirtualBox:~$ sudo adduser develop
[sudo] password for aya:
Adding user `develop' ...
Adding new group `develop' (1004) ...
Adding new user `develop' (1003) with group `develop' ...
Creating home directory `/home/develop' ...
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 develop
Enter the new value, or press ENTER for the default
        Full Name []:
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] y
aya@aya-VirtualBox:~$ sudo gpasswd -a develop iot_group
Adding user develop to group iot_group
```

3)


```
aya@aya-VirtualBox:~$ sudo chown develop:iot_group iot_logger
```

4)


```
aya@aya-VirtualBox:~/Desktop$ cd ~
aya@aya-VirtualBox:~$ sudo chmod 660 iot_logger
[sudo] password for aya:
aya@aya-VirtualBox:~$ ls -l
total 44
drwxr-xr-x 3 aya      aya      4096 23:14 30 أبك Desktop
drwxr-xr-x 2 aya      aya      4096 14:45 27 أبك Documents
drwxr-xr-x 2 aya      aya      4096 14:45 27 أبك Downloads
drw-rw---- 5 develop  iot_group 4096 22:16 30 أبك iot_logger
drwxr-xr-x 2 aya      aya      4096 14:45 27 أبك Music
drwxr-xr-x 2 aya      aya      4096 14:45 27 أبك Pictures
drwxr-xr-x 2 aya      aya      4096 14:45 27 أبك Public
drwxrwxr-x 2 aya      aya      4096 22:15 30 أبك scripts
drwx------ 4 aya      aya      4096 14:55 27 أبك snap
drwxr-xr-x 2 aya      aya      4096 14:45 27 أبك Templates
drwxr-xr-x 2 aya      aya      4096 14:45 27 أبك Videos
```

5)


```
aya@aya-VirtualBox:~$ su develop
Password:
develop@aya-VirtualBox:/home/aya$ cat iot_logger
cat: iot_logger: Permission denied
develop@aya-VirtualBox:/home/aya$ echo "testing"> iot_logger
bash: iot_logger: Permission denied
develop@aya-VirtualBox:/home/aya$ exit
exit
aya@aya-VirtualBox:~$ sudo userdel -r develop
userdel: develop mail spool (/var/mail/develop) not found
aya@aya-VirtualBox:~$ sudo deluser -r develop
Option r is ambiguous (remove-all-files, remove-home)
deluser USER
  remove a normal user from the system
  example: deluser mike

  --remove-home            remove the users home directory and mail spool
  --remove-all-files       remove all files owned by user
  --backup                 backup files before removing.
  --backup-to <DIR>        target directory for the backups.
                           Default is the current directory.
  --system                 only remove if system user

delgroup GROUP
deluser --group GROUP
  remove a group from the system
  example: deluser --group students

  --system                 only remove if system group
  --only-if-empty          only remove if no members left

deluser USER GROUP
  remove the user from a group
  example: deluser mike students

general options:
  --quiet | -q       don't give process information to stdout
  --help | -h        usage message
  --version | -v     version number and copyright
  --conf | -c FILE   use FILE as configuration file

aya@aya-VirtualBox:~$ sudo deluser develop
/usr/sbin/deluser: The user `develop' does not exist.
aya@aya-VirtualBox:~$
```

Open-Ended Questions

1) Files permissions: r (read) → I can see the file's contents, w (write) → I can modify the file's contents, and x (execute) → I can run the file to change from a program to a process.
Directories permissions: r (read) → I can list files inside the directory (with ls), w (write) → I can create, delete, or rename files inside the directory, and x (execute) → I can get into the directory (cd) and access files inside (without x, I can't access anything inside, even if I have the "r" permission).
"ls -l": if it is a file, it gives "-" (regular file) + the (r, w, x) permissions and for the directories, it gives "d" (directory) + the (r, w, x) permissions.

2) Permissions (r, w, x) can be expressed in numbers instead of letters, additionally it is written as permissions for owner, group, and other users. A permission like: -rwxr-x— = 750 (7 for user, 5 for group, 0 for others).
Umask: check and change default access rights for instance if I write umask is 022, the new file will be rw-r--r-- (user rw, group r, others r) because the default for files=666, so 666 - 022 = 644 which is the rw-r--r--. For the directories, the default = 777, so 777 - 022 = 755, resulting in a new dir will be rwxr-xr-x (user gets all permissions, group read/execute, others read/execute).

3) The root user is the superuser with Username: root, UID = 0 and it is considered dangerous because it has unrestricted access to the entire system: it can read, write, and execute any file, change permissions, install/remove software, create/delete users, and modify system configuration. In more detail, the root bypasses all security checks which can lead to an accidental damage (one wrong command can break the entire system "rm -rf / (deletes everything)". On the other hand, the normal user is created by the system administrator (e.g., aya), having a unique UID and limited permissions (e.g. can access only their own home directory (/home/aya), cannot modify system files outside their home, and needs sudo to perform admin tasks).