Files, Directories and Permissions

Files, Directories and Permissions

Log on as linuxuser

```
su - linuxuser
whoami
```

We will create the following directory structure in /home/linuxuser.
linuxuser will be the owner of all files and directories:

```
Hogwarts
├──── dumbledorisdead.txt
├──── Gryffindor
│     ├──── Godric
│     ├──── Harry
│     │     ├──── PhilosophersStone.txt
│     │     └──── sortinghat.txt
│     ├──── Hermione
│     │     └──── potions.txt
│     └──── Ron
│           └──── OldClothes.txt
├──── Muggles
│     ├──── Bayliss
│     │     └──── yaynotkilledbyvoldemort.txt
│     ├──── Bryce
│     │     └──── killedbyvoldemort.txt
│     └──── Burbidge
│           └──── killedbyvoldemort.txt
└──── Slytherin
      ├──── Draco
      │     └──── hairproduct.txt
      ├──── Lucius
      │     └──── brylcreem.txt
      └──── Snapes
            └──── potions.txt
```

Files, Directories and Permissions

Create the Directory Structure

```
rm -rf /home/linuxuser/Hogwarts

mkdir -p /home/linuxuser/Hogwarts/Gryffindor/Harry
mkdir -p /home/linuxuser/Hogwarts/Gryffindor/Hermione
mkdir -p /home/linuxuser/Hogwarts/Gryffindor/Ron
mkdir -p /home/linuxuser/Hogwarts/Gryffindor/Godric
mkdir -p /home/linuxuser/Hogwarts/Slytherin/Snapes
mkdir -p ~/Hogwarts/Slytherin/Lucius
mkdir -p ~/Hogwarts/Slytherin/Draco
mkdir -p ~/Hogwarts/Muggles/Bayliss
mkdir -p ~/Hogwarts/Muggles/Bryce
mkdir -p ~/Hogwarts/Muggles/Burbidge
```

-p means to create the directory structure from the parent directory down

Hint: use the `ls` command to check that your directories are created correctly

Add the Users and Groups

```
sudo groupadd gryffindor
sudo groupadd slytherin
sudo groupadd muggles
sudo groupadd rowling

sudo useradd -G gryffindor,rowling harry
sudo useradd -G gryffindor,rowling hermione
sudo useradd -G gryffindor,rowling ron
sudo useradd -G gryffindor,rowling godric
sudo useradd -G slytherin,rowling snapes
sudo useradd -G slytherin,rowling lucius
sudo useradd -G slytherin,rowling draco
sudo useradd -G muggles,rowling bryce
sudo useradd -G muggles,rowling burbidge
sudo useradd -G muggles,rowling bayliss
```

-G specifies the secondary groups a user belongs to

Hint: Use the `id` command to check that your users are created correctly

Files, Directories and Permissions

Create the Files

```
touch ~/Hogwarts/Gryffindor/Harry/sortinghat.txt
touch ~/Hogwarts/Gryffindor/Harry/PhilosophersStone.txt
touch ~/Hogwarts/Gryffindor/Hermione/potions.txt
touch ~/Hogwarts/Gryffindor/Ron/OldClothes.txt
touch ~/Hogwarts/Slytherin/Snapes/potions.txt
touch ~/Hogwarts/Slytherin/Lucius/brylcreem.txt
touch ~/Hogwarts/Slytherin/Draco/hairproduct.txt
touch ~/Hogwarts/dumbledoreisdead.txt
touch ~/Hogwarts/Muggles/Bryce/killedbyvoldemort.txt
touch ~/Hogwarts/Muggles/Burbidge/killedbyvoldemort.txt
touch ~/Hogwarts/Muggles/Bayliss/yaynotkilledbyvoldemort.txt


chown -R linuxuser:linuxuser /home/linuxuser/Hogwarts
```

touch creates an empty file

chown -R changes the ownership (user:group) recursively beginning with /home/Hogwarts

Hint: use the `ls` command to check that your files are created correctly

Check your set up

```
sudo apt install tree
tree -A ~/Hogwarts
```

Your output should match the tree structure at the beginning of the assignment.

Files, Directories and Permissions

Changing Ownerships and Permissions

We want to change group **ownership** of the directories to the corresponding groups:

```
sudo chown -R :gryffindor ~/Hogwarts/Gryffindor
sudo chown -R :slytherin ~/Hogwarts/Slytherin
sudo chown -R :muggles ~/Hogwarts/Muggles
```

```
-rw-r--r--. 1 linuxuser linuxuser    0 Jan 24 12:59 dumbledoreisdead.txt
drwxr-xr-x. 6 linuxuser gryffindor 4096 Jan 24 12:59 Gryffindor
drwxr-xr-x. 5 linuxuser muggles    4096 Jan 24 12:59 Muggles
drwxr-xr-x. 5 linuxuser slytherin  4096 Jan 24 12:59 Slytherin
```

We want to change the **ownership** of the file dumbledoreisdead.txt so that harry is the **sole owner** of the file (both owner and group):

```
sudo chown harry:harry ~/Hogwarts/dumbledoreisdead.txt
```

```
-rw-r--r--. 1 harry     harry        0 Jan 24 12:59 dumbledoreisdead.txt
```

Files, Directories and Permissions

We want to change the **permissions** of the file dumbledoreisdead.txt so that harry is the only person who can read or write to the file:

```
sudo chmod 0600 ~/Hogwarts/dumbledoreisdead.txt
```

`-rw-------.` 1 harry   harry   0 Jan 24 12:59 dumbledoreisdead.txt

Using Recursiveness

Currently, /home/linuxuser/Hogwarts/Harry (and all files below) are owned by linuxuser:

```
ls -l /home/linuxuser/Hogwarts/Gryffindor
total 16

drwxr-xr-x. 2 linuxuser gryffindor 4096 Jan 24 12:59 Godric
drwxr-xr-x. 2 linuxuser gryffindor 4096 Jan 24 12:59 Harry
drwxr-xr-x. 2 linuxuser gryffindor 4096 Jan 24 12:59 Hermione
drwxr-xr-x. 2 linuxuser gryffindor 4096 Jan 24 12:59 Ron
```

We want to change the **ownership** so that harry is the owner of the directory, sub-directories and all files:

```
sudo chown -R harry /home/linuxuser/Hogwarts/Gryffindor/Harry
```

`drwxr-xr-x. 2 harry      gryffindor 4096 Jan 24 12:59 Harry`

There is a potions.txt file in /home/Hogwarts/Gryffindor/Hermione:

`-rw-r--r--. 1 linuxuser gryffindor 0 Jan 24 12:59 potions.txt`

We want to change the ownership and permissions so that only hermione and harry have read/write access to the file.
First, we change the **ownership** so that hermione and harry can access the file:

```
sudo chown hermione:harry ~/Hogwarts/Gryffindor/Hermione/potions.txt
```

`-rw-r--r--. 1 hermione harry 0 Jan 24 12:59 potions.txt`

Then, we change the **permissions**, so that **only** hermione and harry can access the file:

```
sudo chmod 0660 ~/Hogwarts/Gryffindor/Hermione/potions.txt
```

`-rw-rw----.` 1 hermione harry 0 Jan 24 12:59 potions.txt

Files, Directories and Permissions

We want to know how many muggles have been killed by Voldemort, so let's find any files whose name begins with 'killed' in the /home/Hogwarts/Muggles directory:

```
find /home/linuxuser/Hogwarts/Muggles -name "killed*"
```
```
/home/linuxuser/Hogwarts/Muggles/Bryce/killedbyvoldemort.txt
/home/linuxuser/Hogwarts/Muggles/Burbidge/killedbyvoldemort.txt
```

Lucius is catching up with the times. We need to rename the brylcreem.txt file to hairgel.txt:

```
mv ~/Hogwarts/Slytherin/Lucius/brylcreem.txt \
~/Hogwarts/Slytherin/Lucius/hairgel.txt
```
```
-rw-r--r--. 1 linuxuser slytherin  0 Jan 24 12:59 hairgel.txt
```

Why don't we need to sudo the find or mv commands?