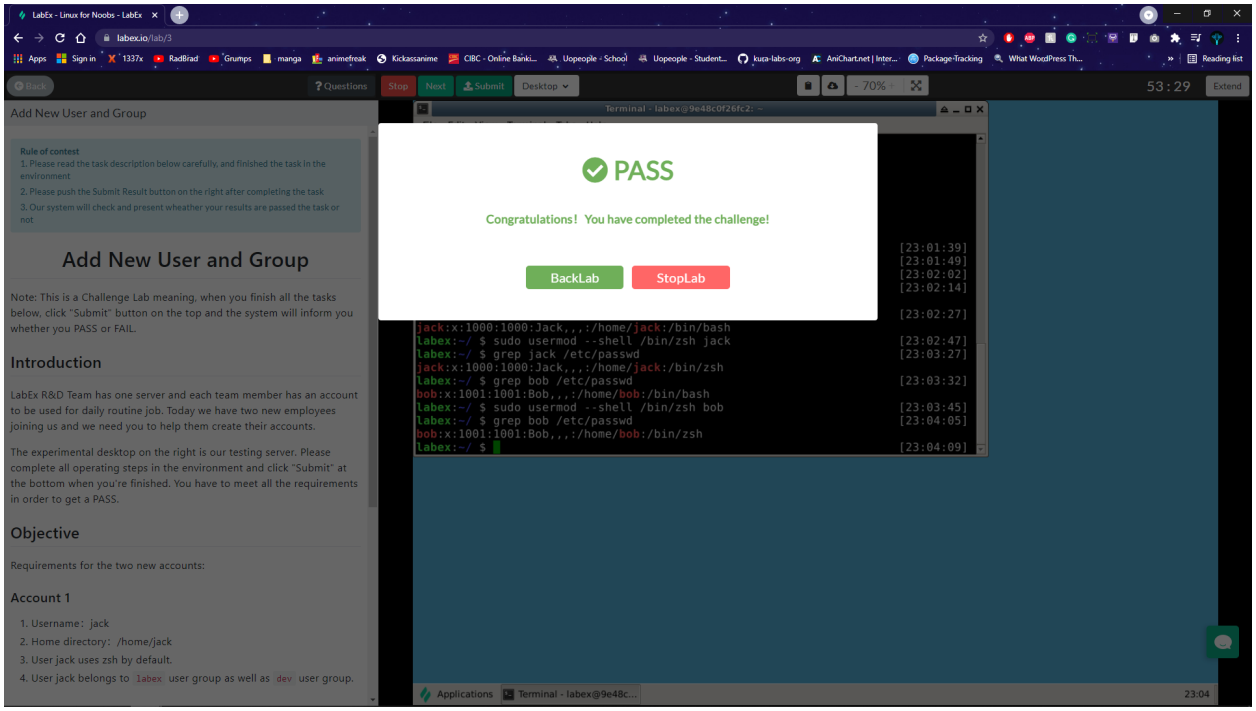
Challenge 1: Add New User and Group



Goal :

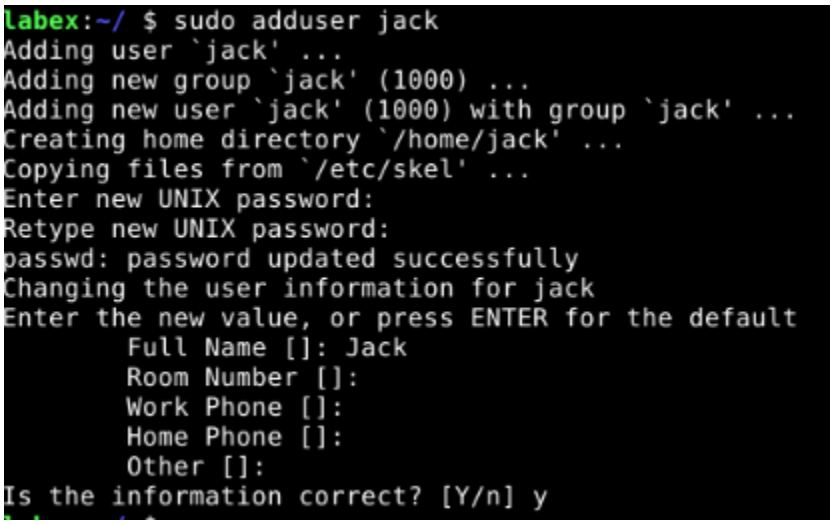
- Add new users jack and bob to the system
- Create new groups, dev and test.
- Add user jack to the dev group and labex group
- Add user bob to the test group and labex group.
- Change the user jack and user bob's shell from bash to zsh.

Steps to add a User:

1. In the terminal ensure you are in the home directory by using the command ($ cd ~).
2. Once in the home directory type the command ($ sudo adduser jack) to add jack as a user.

2.1. adduser is telling the system that the following name must be added as a user to the system

3. The system will prompt you to create a password for the user and enter their relevant information. Follow the instructions and confirm the new user. See image below:



4. Repeat the steps above to add the user bob to the system

4.1. The command should look like this: ($ sudo adduser bob)

Steps for adding a group:

1. Use the command ($ sudo groups) to see what groups are already present on the machine.

1.1. groups references the list of main groups on the system

1.2. **Note: this will verify that the labex group is present.**

2. Add the dev group to the system by using the command ($ sudo groupadd dev). This will be one of the groups the user jack needs to be a part of.

2.1. groupadd is telling the system that the following group or groups should be added to the system.

3. Add the test group by using the command ($ sudo groupadd test). This is the group the user bob needs to be a part of. It is essentially the same command, the only difference is the name of the group we are trying to add.

Steps for adding a user to multiple groups:

1. Use the command ($ sudo usermod -G dev jack) to add jack to the new dev group.
    1.1. usermod is being used to modify the configuration for a specific user. In this case it is for the user jack.
    1.2. The (-G) in the command is signifying that the group dev will be a secondary or supplementary group. If we use (-g) that would make group dev a primary group and it will cause issues later on when trying to add jack to other groups as it would override any other primary groups the user is a part of.
2. Use the command ($ sudo usermod -aG labex jack) to jack to the labex group.
    2.1. The use of the (-aG) in the command means that you will be appending the user to a supplementary or secondary group. The (-a) stands for append. Again, this is done to avoid the issue of overriding primary groups and the append argument only works with the supplementary or secondary group argument, hence the (-aG) and **not** (-ag)
3. Once done, use the command ($ sudo groups jack) to view all the groups the user jack is a part of.
    3.1. This command can be used for any user, as long as you swap out the user's name to the desired one.
4. Repeat the steps about to add the user bob to his respective groups. Remember to swap out the groups names for the names of the groups pertaining to the user bob. Your command should look like this:
    4.1. ($ sudo usermod -G test bob) to add the user bob to the test group.

4.2. ($ sudo usermod -aG labex bob) to add the user bob to the labex group.

4.3. ($ sudo groups bob) - to verify that the user bob is in the correct groups.

Steps for changing the user shell:

1. The various shells are stored in the /etc directory and you can use the command ($ cat /etc/shells) to see what shells are installed on your system.
2. Before we go about changing user shells we must first verify what shell is set for the user. Use the command ($ grep jack /etc/passwd) to see what shell the user account has been set to. See image below for expected output:

```
labex:~/ $ grep jack /etc/passwd
jack:x:1000:1000:Jack,,,:/home/jack:/bin/bash
```

3. Now that we know what shell the user has, and what shell the user needs to have, we can use the command ($ sudo usermod --shell /bin/zsh jack) to switch the shells.
   3.1. --shell is referencing the terminal shell as that is what we are trying to modify for the user.
   3.2. /bin/zsh is calling the shell type with /bin being the directory where it is stored and /zsh being the specific shell type.
   3.3. jack is the name of the user account we are making the configuration change for. This is swapped out for the name of the desired user account the change is required for.
4. Once done, use the command ($ grep jack /etc/passwd) to verify that the user account shell has been successfully changed to zsh. See image below:

```
labex:~/ $ grep jack /etc/passwd
jack:x:1000:1000:Jack,,,:/home/jack:/bin/zsh
```

5. Once confirmed, repeat the same steps for the user bob, ensuring to swap out variables for the correct names. Your command should look like this:

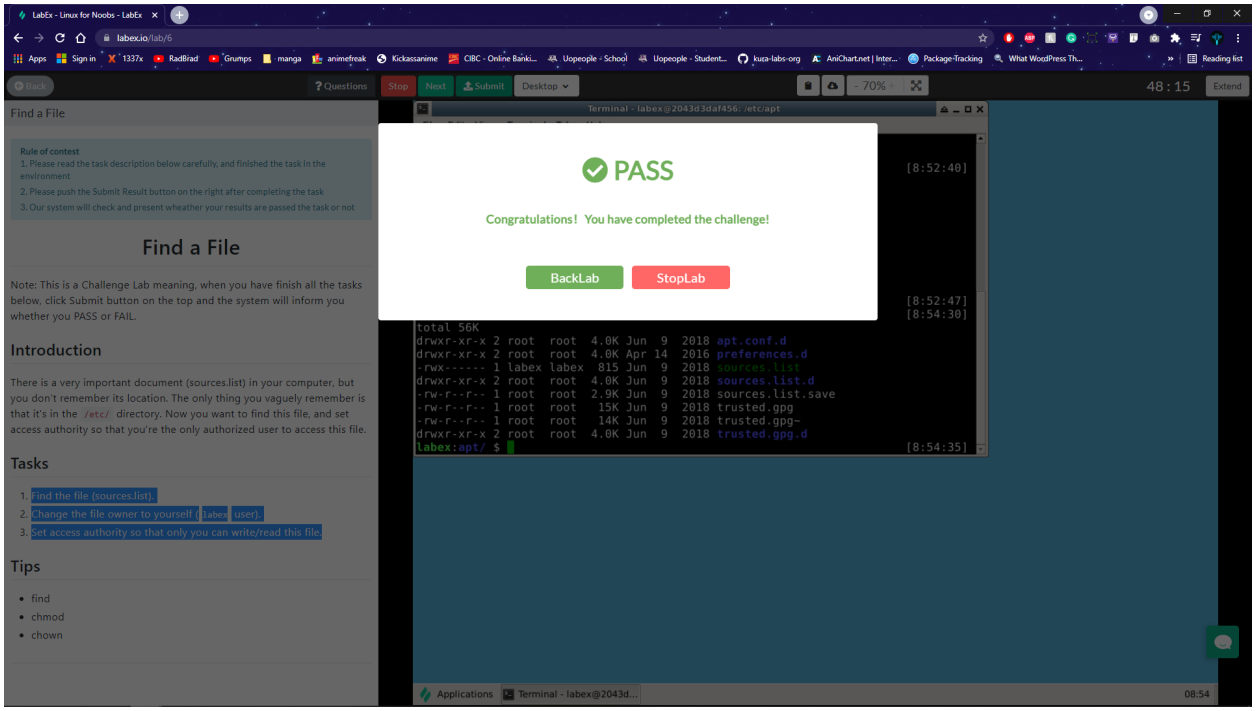
5.1. ($ grep bob /etc/passwd) to check what shell the user bob's terminal is set to.

5.2. ($ sudo usermod --shell /bin/zsh bob) to change the user bob's terminal shell to zsh.

5.3. ($ grep bob /etc/passwd) - to verify that the user bob's shell has been set to zsh.

6. Once everything is confirmed - Submit Assignment

Challenge 2: Find a File



Goal :

- Find the file (sources.list).
- Change the file owner to yourself (labex user).
- Set access authority so that only you can write/read this file.

Steps for finding the file:

1. In the terminal go to the root directory by using the command ($ cd /).
    1.1. cd stands for change directory and it is used to change your active directory.
    1.2. / is the symbol for the root directory.

2. Once in the root directory type the command ($ sudo find -name sources.list) to locate the files. Result should look like below:

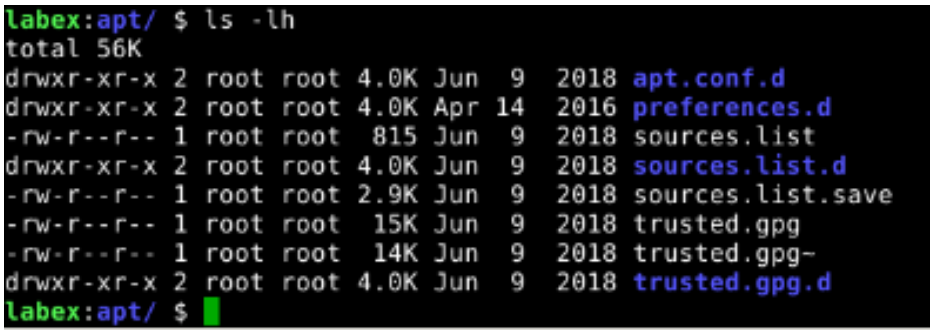
2.1. find is a command used to help users locate specific files or directories.

2.2. -name is used to help the command understand what the name of the file or directory is.

2.3. sources.list is the name of the file we are looking for.

3. Move to the directory that contains the intended file by using the command ($ cd /etc/apt).

4. Use the list command ($ ls -lh) to see the file's ownership and read/write permissions. See image below:

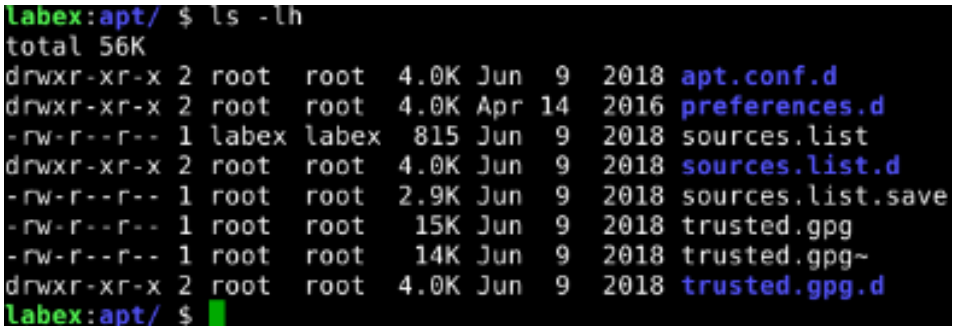


4.1. ls command shows the elements in the working directory

4.2. -l makes the list command display the information in a listing format

4.3. -h makes the ls command display the information in a human readable format eg. display 4096 as 4MB. This is often combined with -l hence -lh.

5. While in the apt directory, use the following command to change the ownership of the sources file ($ sudo chown labex:labex sources.list). See image below:



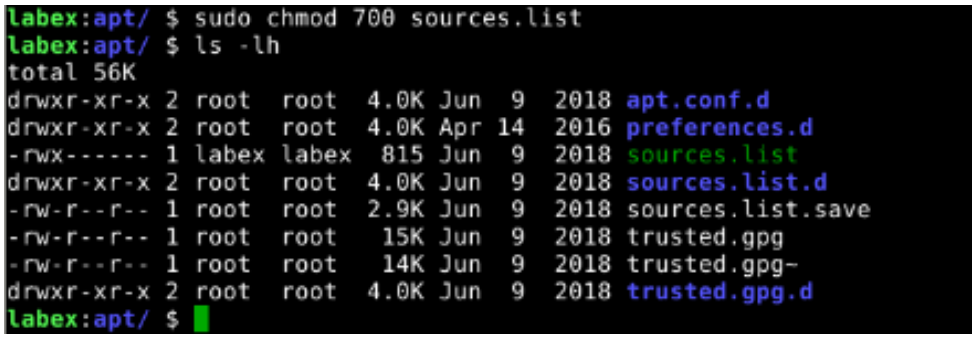
   5.1. chown stands for change ownership and it is used to allow users to change a file's ownership permissions.

   5.2. labex:labex this represents the user and group respectfully (user:group) that you want to change the ownership to.

   5.3. sources.list is the name of the file we are changing the ownership of.

6. Use the list command ($ ls -lh) to check to see if the file's ownership has changed.

7. Once ownership change has been confirmed, use the command ($ sudo chmod 700 sources.list) to change the read/write permissions. See image below:



   7.1. chmod is a command used to change the access permissions of files and directories.

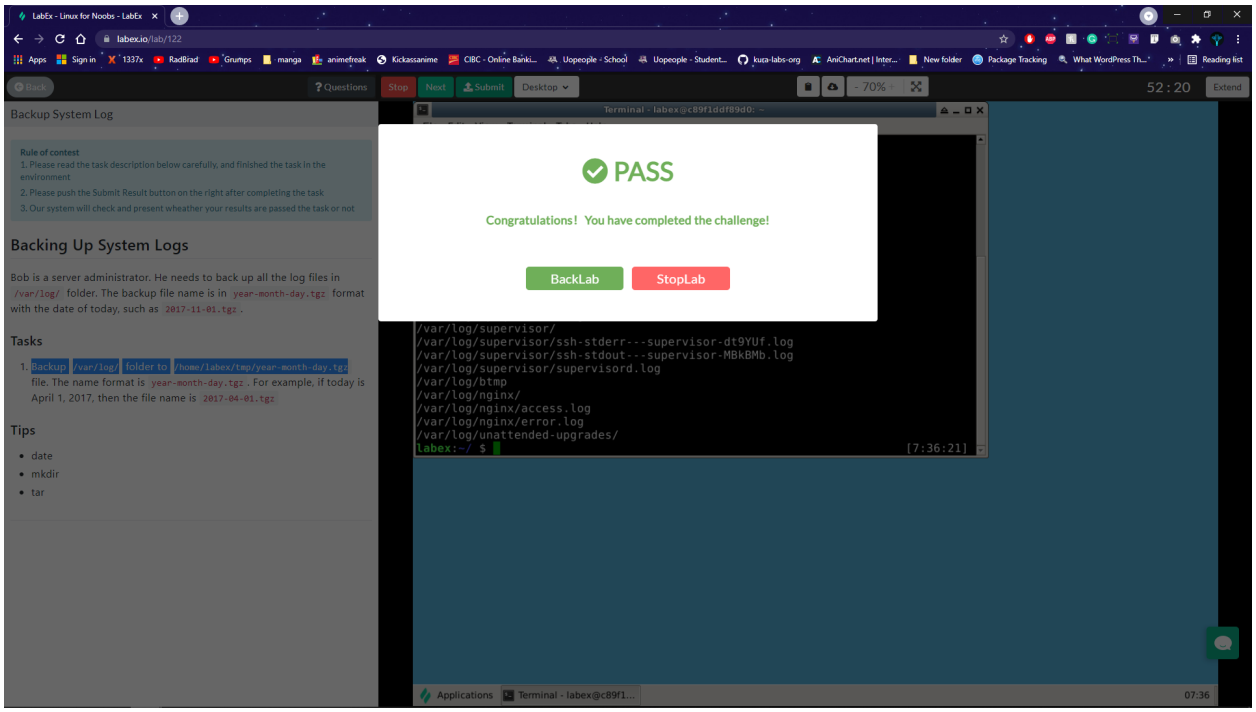
   7.2. 700 is the numeric representation of root (7), group (0) and user (0) respectfully. The 7 represent full read, write and execute permissions. The 0 represents zero or no read, write and execute permissions.

7.3. sources.list is the name of the file we are changing the permissions for.

8. Use the list command ($ ls -lh) to verify the change in the files read/write permissions.

9. Submit Assignment.

Challenge 3: Backup System Log



Goal :

- Backup /var/log/ folder as a .tgz file to a created tmp folder in the labex directory in home directory.
- The file must use the naming convention of year-month-day.

Steps for finding the file:

1. Open the terminal and create a directory name (tmp) in the labex directory of the home directory. **Note: When opening the terminal, the user starts off in the home directory by default.** Use the command ($ sudo mkdir /home/labex/tmp). See image below for output:

1.1. sudo in to give a user temporary superuser or admin privileges to execute a command.

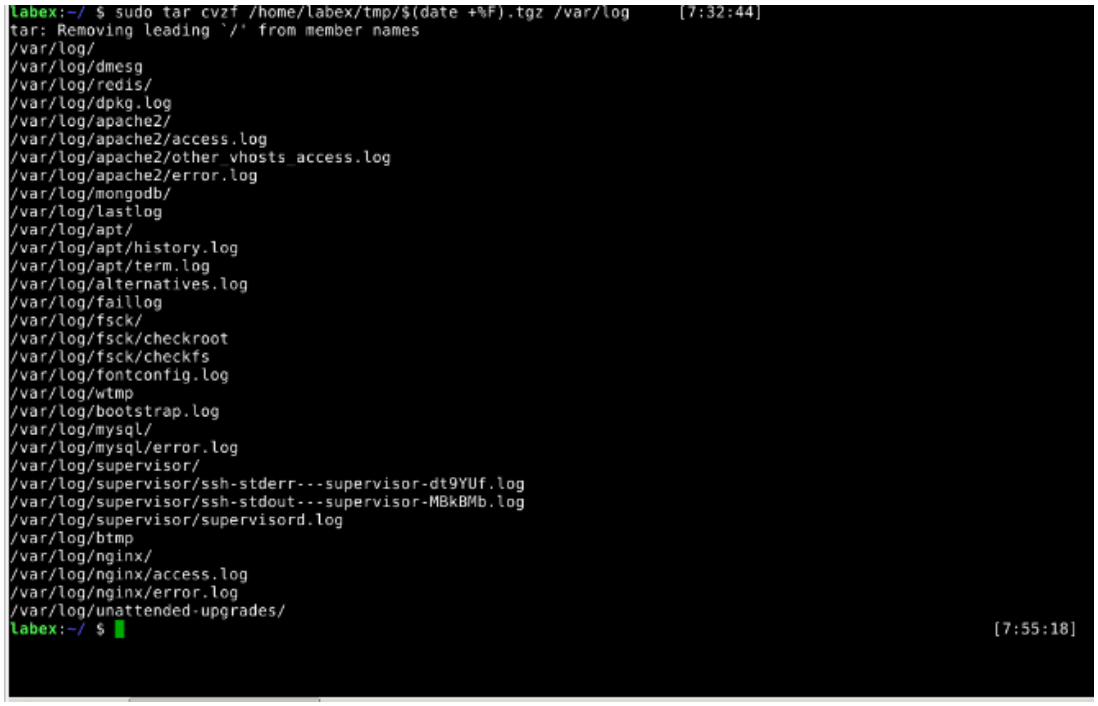
1.2. mkdir is the command that allows a user to make a new directory or a folder on the system.

1.3. /home/labex/tmp this part of the command tells the stem where to make the new directory and what to call the directory. /home/labex is the location and /tmp is the name of the directory.

2. To verify that the directory was made, use the ($ ls) command to view the elements in the home directory. See image below:

2.1. ls command shows the elements in the working directory

3. After confirming the directory is made, use the command ($ sudo tar cvzf /home/labex/tmp/$(date +%F).tgz /var/log) to create your backup .tgz file of the logs. Executing the command show look like the image below:



3.1. tar is a linux archive command and it is used to archive (compress) and unarchive (uncompress) (zip and unzip files).

3.2. cvzf is used with the tar command to create an uncompressed archive of a file.

3.3. /home/labex/tmp/ is the location of where the file will be created.

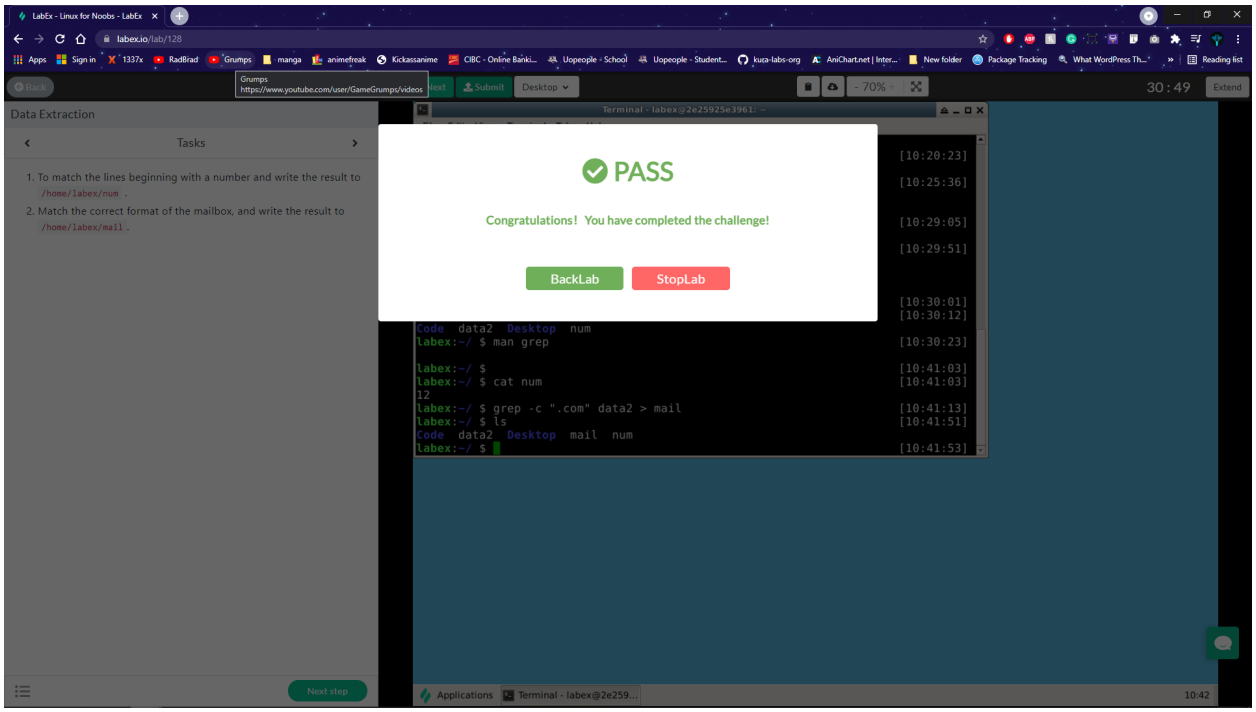
3.4. (date +%F).tgz is the part of the command that will name the .tgz file today's date in the format year-month-day.

3.5. /var/log is the part of the command that indicates what is benign archived.

4. When done, use the command ($ cd tmp) to enter the tmp directory. Then use the ($ ls) command to confirm that the .tgz file was created successfully. See image below:

5. Submit Assignment.

Challenge 4 (5): Data Extraction



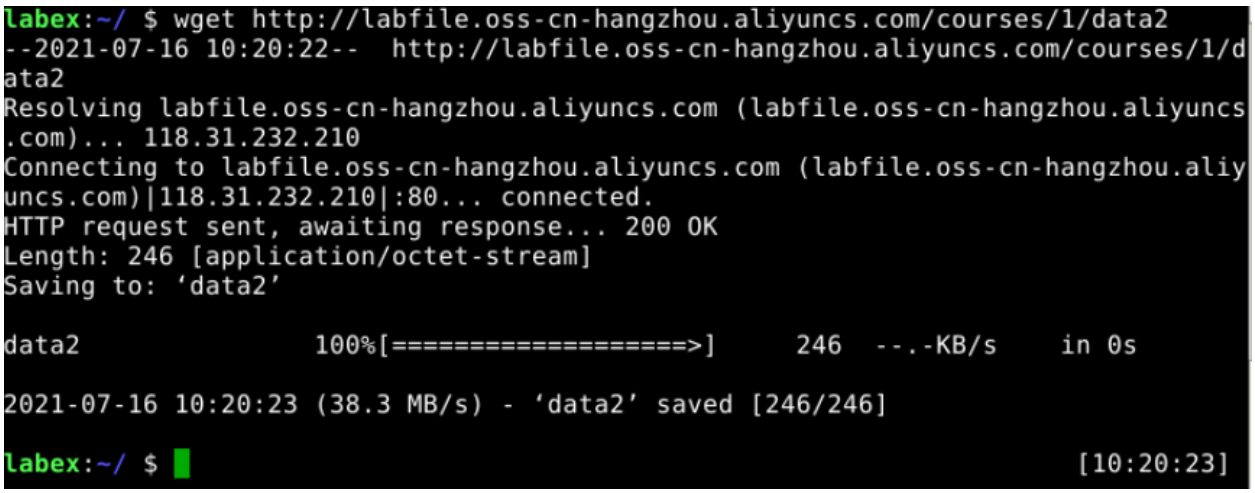
Goal :

- Download data and save it as Data2 in the labex directory on the home directory.
- Sort the Data 2 file for digits and mailbox and save them to the num and mail file respectfully.

Steps for downloading as saving the file:

1. To download the file use the command ($ wget http://labfile.oss-cn-hangzhou.aliyuncs.com/courses/1/data2). It will automatically label as data2 and save to /home/labex directory. **Note: When opening the terminal, the**

user starts off in the home directory by default. See image below:



1.1. wget is a command that allows users to download files in the background through the terminal.

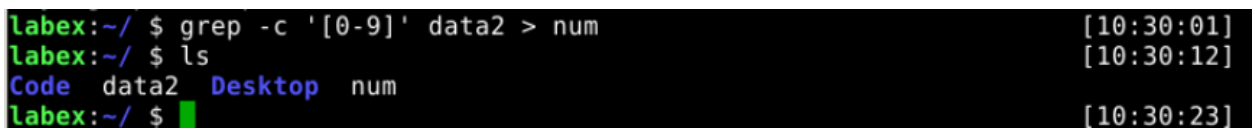
1.2. http://labfile.oss-cn-hangzhou.aliyuncs.com/courses/1/data2 is the url of the file the user is looking to download.

1.3. /data2 is the name of the file on the web server, therefore when the file is downloaded using that link, the file saved on the system is automatically named data2

2. Use the ($ ls) command to verify that the file was downloaded and saved.

2.1. ls command shows the elements in the working directory

3. To shift through the file for all lines beginning with numbers and save them to the num file, use the command ($ grep -c '[0-9]' data2 > num).



3.1. grep stands for “**global regular expression print**” and it is a command that allows users to sort inputs and data according to complex rules. eg. If I want to find all the words in a list of 400 random words that begin with the letter b, I can use a grep command to do so.

3.2. -c this represents count and when used with the grep command, it tells the system to count how many lines of the expression I am looking for.

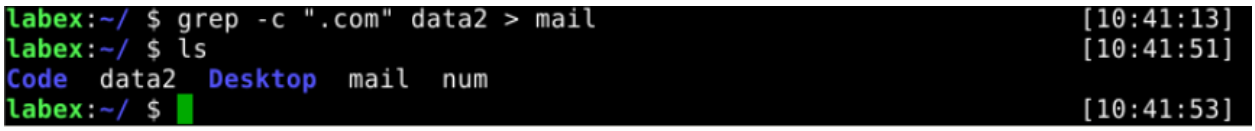
3.3. ‘[0-9]’ this part of the command tells the system that I am looking for any data in the full that begins with a number. It acts as a reference range for the grep command.

3.4. data2 this the name of the file the grep command if sorting.

3.5. > num tells the system to output the line count to a new file named num.

4. Use the ($ ls) command to verify that the num file was created and saved.

5. To shift through the file for all lines that contain mailboxes and save them to the mail file, use the command ($ grep -c “.com” data2 > mail). The command is nearly identical with a few differences.



5.1. “.com” replaces the ‘[0-9]’ as to what the grep command is sorting through the file form. Since mailbox in this exercise references email addresses, the user must ask grep to look for all lines that have “.com” in them.

5.2. mail is the name of the file where the mailbox line count will be saved to.

6. Submit Assignment.