CSC3320 System Level Programming

Lab Assignment 3 (Post-Lab)

Due at 11:59 pm on Wednesday Sept. 15th, 2021

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Purpose: Learn how to set permissions for the files and directories. Practices on editing a file via the vi editor.

Note: Please follow the instructions below step by step, and then write a report by answering the questions and upload the report (named as Lab3\_FirstNameLastName.pdf or Lab3\_FirstNameLastName.doc) to Google Classroom, under the rubric Lab 3 Out-of-lab Assignemnt.

Please add the lab assignment NUMBER and your NAME at the top of your file sheet. Part 1: VI Editing - Small file

Open your terminal and connect to snowball server. Change your directory to your home directory (cd ~ ), and then create a new directory named as “Lab3” (mkdir Lab3). After that, go to directory Lab3 (cd Lab3) and please download the file "Try.c" (content shown in table below) by the following command (internet access required):

cp /home/bbello1/Public/Try.c Try.c

Be sure it succeeds using “ls” to see the file name “Try.c” listed.

Try the following steps by issuing some commands in your vi

editor 1) Open "Try.c" with vi editor

$vi Try.c

1

2) Move cursor to the beginning of “Error!”

use UP DOWN LEFT RIGHT arrow to control cursor

3) Insert “xxx”.

i

type “xxx” (hit x three times)

4) Append a blank line after the current line.

Hit Esc to command mode o (lowercase

o)

5) Delete “xxx”.

Hit Esc to command mode.

Move cursor to the beginning of "xxx", press x three times or press 3s to delete "xxx"

6) Copy the first 2 lines, move cursor to the beginning of file, and then paste it after current line

:1,2y

:0 p

7) Delete the first 2 lines

:1,2d

8) Save it

:w

9) Replace all "fptr" with "FPTR"

:1,$s/fptr/FPTR/g

10) Save and exit.

:wq

Part 2: VI Editing - Large file

1) Go into your Lab3 directory.

$cd ~/Lab3

2) Copy "RealEstate.csv" from instructor's public directory to your Lab3 directory

again.

$cp /home/bbello1/Public/RealEstate.csv .

Please write the commands you will issue to complete the following tasks and answering corresponding questions step by step in your report.

3) Use vi to open “RealEstate.csv”.

Ans 3) vi RealEstate.csv

4) Move the cursor to the last line (without knowing the number of last line).   
Ans 4) :$ or shift+g or G

5) Display line number.

Ans 5) :set number

6) Search for the transaction for the estate located at "111 EAST" Which line is this string located? (Please just write down the line number) Delete this line.   
  
Ans6) /\<111 EAST\> There are 2 locations listed on “111 EAST” “111 EAST AVE” which is on line 58 and the other one “111 EAST KELLOGG BLVD” which is on line 5371.  
I’m assuming we have to delete line 58.   
I pressed double d to delete the line on line 58 “dd”

7) Move the cursor to the line 50.

Ans7) :50

8) Substitute all comma "," with colon ":" from line 50 to line 54.

Ans) :50, 54s/,/:/g

9) Copy line 50 to line 54 to the end of file.

Ans) :50,54y

shift +]

Just press p

10)Remove line 50 to line 54.

Ans10) 50, 54d

11) Describe how to enter the text mode and insert a new line "Recorded in year 2008" between line 1 and line 2.

Ans11) Shift +[ to go to the start of the file then we go to the end of the line 1 and press the key ‘o’ and then we get into insert mode by pressing ‘i’ but usually after creating new line you get into insert mode and then you can write the given

12) Switch back to command mode.

ans12) Press escape

13) Save the file and quit vi.

ans13) :wq

3

Part 3: Permissions for files

Follow the instructions step by step and finish the questions as required. 1) Go into your Lab3 directory.

$cd ~/Lab3

2) Check the file permissions for file "Try.c" in your own Lab3 directory. $ls -l Try.c

3) You may see similar output as below, in which rw-rw-r-- of the first field is the file permission string for "Try.c".

[bbello1@gsuad.gsu.edu@snowball Lab3]$ ls -l Try.c 

-rw-rw-r--. 1 bbello1@gsuad.gsu.edu bbello1@gsuad.gsu.edu 379 Sep 8 10:44 Try.c

 The leftmost 3 characters rw- tells us that the user (owner of the file) can only read and write the file.

 The middle 3 characters rw- tells us the other users in the same group as the owner can only read and write the file.

 The last 3 characters r-- tells us the other users in the other groups different from owner can only read the file.

Note: once you copy a file from other directory or download a file from other resources, you are the owner of the new copied or downloaded file.

4) Remove the read permission for the owner (yourself).

$chmod u-r Try.c

5) Check the file permissions for file "Try.c" again.

$ ls -l Try.c

6) You may see similar output as below, in which -w-rw-r-- of the first field is the file permission string for "Try.c".

[bbello1@gsuad.gsu.edu@snowball Lab3]$ ls -l Try.c 

--w-rw-r--. 1 bbello1@gsuad.gsu.edu bbello1@gsuad.gsu.edu 379 Sep 8 10:49 Try.c

So -w- in the leftmost 3 characters tells us that the user (owner of the file ) only has the permission to write something into the file.

7) Try the vi editor again to modify the file.

$vi Try.c

4

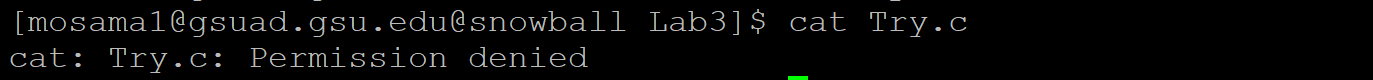
8) However, you may find following message displayed at the bottom of the screen which means you do not have the right to read "Try.c".

  
9) Quit vi editor.

:q

10) Try read "Try.c" again using cat.

$cat Try.c



11) Use chmod with an octal number to let all the users only have read permission for "Try.c".

$chmod 444 Try.c

Note: The permission string to be set should be r--r--r--. Convert each group of three characters into decimal to form an octal number, which should be 444.

12) Check the file permissions for file "Try.c" again. And explain the meaning of each character in the file permission string.

Ans12) what we mean by that is that we have set everyone’s permission to read only, the first execute means 1, write means 2, 3 means write and execute, 4 means read, 5 means read and execute, 6 means read and write, 7 means all permission(read,write and execute). All of these are calculated how we calculate octal numbers. When we do the command $chmod 444 Try.c The first 4 is for the user/owner. The second 4 is for group and the third 4 is for other users.:

13) Try the vi editor again to modify the file. Then remove one line by pressing dd $vi Try.c

Move your cursor to some line and press dd

14) Try to save the file in the vi editor.

:w

15) Can you find some error message at the bottom of the screen? If yes, what is it and how to quit the vi editor without saving the modification.  
Ans 15) it says E45: ‘readonly’ option is set (add ! to override). We need to do then :q! To quit then

16) Use chmod to add write permission to all the users for "Try.c".  
Ans16) $chmod 666 Try.c

17) Check the file permissions for file "Try.c" again. And explain the meaning of each character in the file permission string.  
Ans17) we now have after doing $chmod 666 Try.c we have -rw-rw-rw-  
This first - if it is directory it will show d since, it’s a file it only shows -. The first rw- specifies that user can only read, write and cannot execute. The second rw- specifies that the group can only read, write and cannot execute. The third rw- specifies that other users can only read, write and cannot execute.

Part 4: Permissions for directories

The permissions also work for the directories. However, the permissions for the directories may have different behaviors.

Let us learn the permissions for directories by only changing different permissions to the owner of the file.

1) Go to your home directory and then check the permissions for directory Lab3. $cd ~

$ls -ld ~/Lab3

Note: -d option will let you check the detailed information for the directory instead of its contents.

2) You may see similar output as below, in which rwxrwxr-x of the first field is the permission string for directory Lab3.

ls -ld ~/Lab3 

drwxrwxr-x. 4 bbello1@gsuad.gsu.edu bbello1@gsuad.gsu.edu 4096 Sep 8 11:11 /home/bbello1/Lab3

3) Use chmod with octal number to forbid all permissions to all users. $chmod 000 ~/Lab3

4) Check the permissions for directory Lab3. You may see similar output as below. The permission string is changed to ---------.

ls -ld ~/Lab3 

d---------. 4 bbello1@gsuad.gsu.edu bbello1@gsuad.gsu.edu 4096 Sep 11:12 /home/bbello1/Lab3

5) Finishing the following tasks and fill out the blanks in the row for owner's permission "---" in the table below. If the task or command can be executed successfully, mark Y in the table, otherwise, mark N in the table. Please mark N/A if the task or command is not executed.

A. Check the contents in directory Lab3.

$ls ~/Lab3

B. Create a directory named as "test" in Lab3.

$mkdir ~/Lab3/test

C. Create a file named as "test.txt" in Lab3.

$cat>~/Lab3/test.txt

A test

^D

D. If (B) succeeds, remove the created directory "test" of Lab3. $rm -r ~/Lab3/test

E. If (C) succeeds, copy "test.txt" from your Lab3 into your home directory. $cp ~/Lab3/test.txt .

F. Go into directory Lab3.

$cd ~/Lab3

The blanks in row "---" have been filled out in the table. Please compare it to your answers.

6) Fill out the blanks in other rows by repeating 3) to 5) when the owner is assigned different permissions as in the first column of the table. However, when setting the permissions, we still need to forbid all the permissions to all other users. So the last two bits in the octal number should always be kept as 00.

For example, since owner's permissions is --x at next row, we should first set the file permission by issuing the command chmod 100 ~/Lab3. And then fill out the blanks in the row for

permissions --x by repeating 5).

| Owner’s  Permissions | ls | mkdir | Cat > | rm | cp | cd |
| --- | --- | --- | --- | --- | --- | --- |
| --- | N | N | N | N/A | N/A | N |
| --x | N | N | N | N/A | N/A | Y |
| -w- | N | N | N | N/A | N/A | N |
| -wx | N | Y | Y | Y | Y | Y |
| r-- | N | N | N | N/A | N/A | N |
| r-x | Y | N | N | N/A | N/A | Y |
| rw- | N | N | N | N/A | N/A | N |
| rwx | Y | Y | Y | Y | Y | Y |

Note: Since you need to try at least 56 commands, to save the time, you can press upper arrow or down arrow to repeat previous or next command.