Lab 4: File manipulation commands **Due date:** 10/12/2021

In this lab assignment we will be practicing with file manipulation commands. Most of the commands used in this assignment are explained in the textbook (read the chapter and practice with the projects at the end of it) but there might be a few things that you will need to learn from other sources. You can always use a search engine to get more information on commands or ways to do certain things.

List of Tasks

1. Once in Linux create a file named **lab4_2344_tXX** (XX are the 2 digits corresponding to your team number) to enter the commands that you will use to answer questions 1 through 8. The commands must be entered in the order that you used them on different lines.

2. First create a directory lab4 in your home directory, and then move into it. Then, create a directory structure under lab4 as shown below. **Note:** the names preceded by a '/' are directories and all others (bolded) are regular files. Pay attention to the indentation, which reflects the nesting of subdirectories.

```
/eastcoast
        /illinois
                northwestern
        /indiana
                purdue
                notredame
        /maryland
                rutgers
                maryland
/midwest
/westcoast
        /california
                berkeley
                stanford
/rockies
```

2. By mistake, a couple of midwestern states and their universities have been listed under eastcoast. We are now trying to move the misplaced directories and their contents together to the correct location, so that the directory structure looks like:

   /eastcoast
   - /maryland
     - **rutgers**
     - **maryland**
   - /midwest
     - /illinois
       - **northwestern**
     - /indiana
       - **purdue**
       - **notredame**
   - /westcoast
     - /california
       - **berkeley**
       - **stanford**
   - /rockies

   Write an **mv** command to achieve the desired effect. Note that the mv command implicitly recurses through the given arguments so you can move entire directory trees (in contrast, the cp and rm commands require the -r option to recursively copy to a new location or recursively delete from a given location). Before answering this question, first get into the lab4 directory. Then type your mv command from here.
   QUESTION 1: What command did you use?

3. Go back to the lab4 directory.
   QUESTION 2: What ls -l commands would you use to list :

   a) the universities (not states or regions) that have the character "n" in them.

   b) the universities (not states or regions) that start with the character "n".

   c) the universities (not states or regions) that have at least three vowels.

   d) the states (but not their contents).

Important: before you attempt any command read the following explanation to understand what your output should look like.
For the first three commands you should see a hyphen (‘-‘) on the leftmost column of the listing. The names of the files representing the universities will be displayed ***preceded by the path*** (do not confuse this with displaying the states or regions).
For the last command you should see a ‘d’ on the leftmost column of the listing.

You can assume that states are those directories at the second level of nesting. The regular expressions that you have to come up with must perform their intended roles in any directory system, not just for the example directory system given here (that is, they should work for any directory names). You are also not allowed to solve the questions yourself and explicitly list the answers in the ls command. To answer these questions you should review **wildcard characters** and investigate about **regular expressions** and **metacharacters**. Do a search on [:alnum:] and see what you get.

4. Create a directory named **other** in lab 4, get into it, and copy in it the files shown below from **/files/labs/lab4**

corp_phones1, corp_phones2, product1, product2, products, and **vendors**

Use only **one** copy command to accomplish this task. Use wildcard characters to create a list of arguments (name of files) as efficient as possible (that is, with a minimum number of arguments but precise). Be careful with the use of the wildcard characters because there might be files with similar names such as ***product1*** or ***product1b***. If you copy these files along with the required files, then your command is incorrect!

QUESTION 3: What command did you use (specify all the arguments)? :

Note: for the next 5 questions you will have to append the output of the commands to a file. The outputs must be separated by a blank line so use a command to add a blank line after each output as you go appending them to the file.

5. Concatenate the content of product1 with product2 (in this order) and send the result to a file named **lab4.txt**.

QUESTION 4: What command did you use (specify all the arguments)? :

6. Combine side by side the content of files product1 with product2 (in this order) and append the result to file **lab4.txt**. Use character '#' as separator.

QUESTION 5: What command did you use (specify all the arguments)? :

Challenge (just for the fun of learning something ☺)**:** what would you modify in this command to display each line of the second file right under the corresponding line of the

first file (like if they had been merged). Hint: search the web for "escaping in linux" and learn about escape characters.

7. Cut fields corresponding to the last 4 telephone digits, last name, first name, and position from corp_phones1 and append the result to file **lab4.txt**. Now cut the same fields from corp_phones2 and append the result to file **lab4.txt**.

QUESTION 6: What commands did you use (specify all the arguments)? :

8. Sort corp_phones2 by the three digits following the area code of the telephone number, last name, and first name and append the result to file **lab4.txt**. Make sure that you do not get repeated records in your result.

QUESTION 7: What command did you use (specify all the arguments)? :

9. Join files products and vendors based on the vendors code outputting the product's code and name followed by the vendor's name (in this order) and append the result to file **lab4.txt**. Ensure that a line is produced for each unpairable line in file products and text "No Vendor" is used to replace the empty fields for the unpairable lines.

QUESTION 8: What command did you use (specify all the arguments)? :

When done, submit lab4_2344_tXX *(XX are the 2 digits corresponding to your team number)* ***through Blackboard using the "Assignments" tool. Do Not email it.***