Scripting and Computer Environments - CSE 505
IIIT Hyderabad - Monsoon 2016
ASSIGNMENT -1

ASSIGNMENT DATE : 15-Sept-2016
SUBMISSION DATE : 11:50 PM, 23-Sept-2016

SUBMISSION FORMAT :

1. Create a folder with your roll number <rollno>_assignment1
2. Under the folder paste your commands list in a file names <rollno>_assignment1.cmd and script file as<rollno>_assignment1.script
3. Compress the file as <rollno>_assignment1.tar.gz and then upload it to your moodle account.

How to get zero in the Assignment?

1. DEVIATING FROM THE UPLOAD FORMAT will get you a straight zero.
2. ANY KIND OF PLAGIARISM will also lead to a straight zero.

SECTION 1
System Commands and basic Bash Scripting

1. Create two new users “Hermione” with its home directory set to “~/SCE/Assignment1”, & “Harry” with default home directory. Set their group name as “hogwarts”. And do all your work as Hermione in new user home directory.
   Also, hermione makes sure that all the files created by her henceforth are accessible for read/write only to her and no one else. How does she do that?

2. Professor McGonagall wants to Hermione to print all natural numbers starting from 1 on her terminal after every one second. Write a script/command to do this task for Hermione.

3. Harry cannot write natural numbers through script. Hermione wants to help him. She allows harry to ssh into her system. When Professor McGonagall starts evaluation in lab Hermione executes her natural numbers command/script from terminal1, and output is available on both terminal1[hermione] & terminal2[harry]. [Hint: Use ‘who’ to get user info]

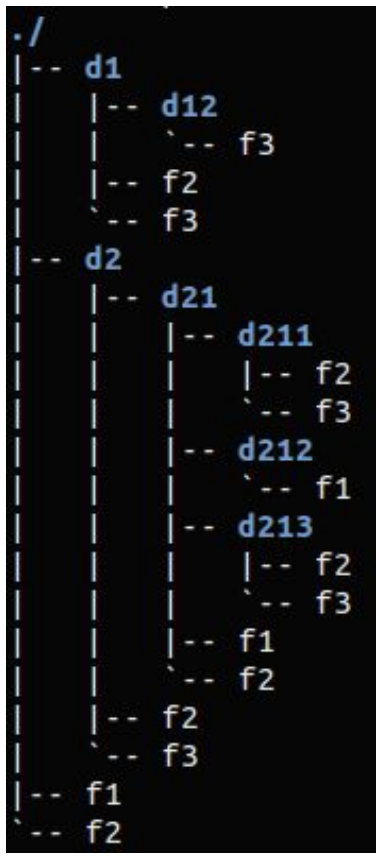
4. Hermione believes in helping but is strict when it comes to learning. She helped harry in the lab but now wants harry to implement the solution. Because of hermione's file permissions he cannot copy these files.
   But oh well, Harry has got credentials of hermione's system(Remember he ssh'd into hermione user). Poor Hermione. Help Harry to copy all files created by hermione (odd.sh,even.sh,?).
   [Points to Ponder : How else can ssh be used/misused?]

SECTION 2
Regex

1. Question:
   a. List the files in current directory with names from x0005 to x0014 using shell wildcards.
   b. Print number of characters, number of bytes and length of longest word of files x0005 to x0014 excluding the file x0007. Use shell wildcards to match files.
   c. Search for all the files in current directory with name starting from character 'x' and ending with a numeral and delete them using single command.
      P.S No pipes, command separations, redirections are allowed.
2. Print unique links count of all files and directories present in current directory. For eg., if files A,B,C,D are present in current directory with number of links 1,2,1,3 respectively, then the
   output should print
   1
   2
   3
   (Do not make it specific to your current directory. It should be generic)

Please extract the *directory-structure.tar.gz* and **execute all your commands for the questions 3rd, 4th, and 5th by making directory-structure as your PWD**. For your reference, the tree-structure of the directory *directory-structure* is given in the image.

a. All the entities beginning with **d** represent the directories and **f** represent the text files.
b. Contents of the files:
   f1 ⇒ hello world
   f2 ⇒ hello baby
   f3 ⇒ hello pappu
c. ./ ⇒ represents the directory *directory-structure*



Level	⇒	**Directories**
0 or PWD	⇒	./
1	⇒	d1, d2
2	⇒	d12, d21
3	⇒	d211, d212, d213

3. From the PWD, perform the following tasks
   Note:
   1. A single command is expected for each of the below questions. DON'T use ***find*** command.
   2. Ensure that your commands will work even if we run your submitted commands on a directory structure where the directory names may not begin with **d**, and the file names may not begin with **f** and the **directory-structure could be completely different**.

   a. Display all the file-names present in the folders present at 2nd level.
      e.g., output (for the directory structure given in the image)
      ./d1/d12/f3
      ./d2/d21/f1
      ./d2/d21/f2
   b. List all the files present in the directory at 10th level.
      e.g., output (for the directory structure given in the image)
      No outputs appears.
      Reason: There is no directory at level 10.
   c. Show all the file-names present in the PWD and the directory at 3rd level.
      e.g., output (for the directory structure given in the image)
      ./d2/d21/d211/f2
      ./d2/d21/d211/f3

./d2/d21/d212/f1
./d2/d21/d213/f2
./d2/d21/d213/f3
./f1
./f2

d. Print the relative path w.r.t PWD for all the files that contain the word *baby*.
e.g., output (for the directory structure given in the image)
./d1/f2
./d2/d21/d211/f2
./d2/d21/f2
./d2/d21/d213/f2
./d2/f2
./f2

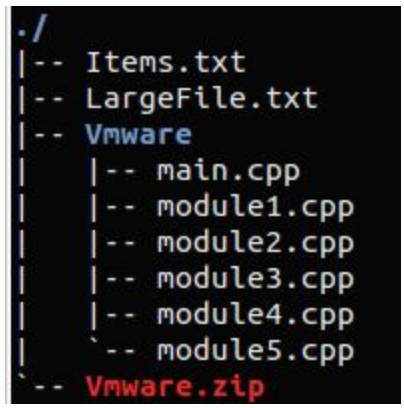
e. Display the relative path for all the files which are present in the directory at level-0 and directory at level-2 and contain the word *world*.
e.g., output (for the directory structure given in the image)
./d1/d12/f3
./d2/d21/f1
./d2/d21/f2
./f1
./f2

f. List all files present in the directories at level-1 and directories at level-3 which doesn't contain the word *pappu.*
e.g., output (for the directory structure given in the image)
./d1/f2
./d2/f2
./d2/d21/d211/f2
./d2/d21/d212/f1
./d2/d21/d213/f2

4. Perform the actions specified in the above question(Question 4) using the find command. (solution for each question should NOT span more than 2 commands)

5. Display all the file-names(don't display the inode numbers) with even inode numbers in the PWD. See that the file-names are displayed in a single line, and are sorted in the Descending order(from left to right) of their respective inode-numbers.
   e.g.,
   If the inodes and file numbers are
   4866049 d1
   4866050 d2
   4851386 f1
   4852561 f2
   Output should be
   d2 f1
   Explanation
   In the above case, d2 and f1 have even inode numbers. On sorting them in descending order of inode names, we get d2 f1.

6. Write a sequence of command to find the size(in KBs) of the current working directory. Size must be computed by considering the size of all the files present in the current working directory and the files which are present in its children directories and so on…
   e.g.,
   For the directory structure given in the figure,
   sizeof(PWD in KiloByte) =
   sizeof(Items.txt) +
   sizeof(LargeFile.txt) +
   sizeof(Vmware/main.cpp) +
   sizeof(Vmware/module1.cpp)+
   sizeof(Vmware/module2.cpp) +
   sizeof(Vmware/module3.cpp) +
   sizeof(Vmware/module4.cpp) +
   sizeof(Vmware/module5.cpp) +
   sizeof(Vmware.zip)



   NOTE: The directory from which we run your command may have any number of nested directories and files. So, please construct your command accordingly. Also ensure that the number of commands will not be more than 2.

7. Fetch the inode numbers of all files and directories present in dir Vmware, and store the same in “inode.txt”.
   If suppose there are 3 files/dirs in the directory named Vmware

File Name	inode
x	123
y	1234
z	111

Then “inode.txt” should contain
123
1234
111

8. Given a file, remove all the line which are blank lines or contains only space characters and print all other lines on the screen. (file name: **input**)
NOTE: use only grep

9. In a given file containing records of employees (which has name, address and phone numbers among other details) Extract the rows of those employees who use a cellphone. (10 digit compulsory) But the phone number may be prefixed with an optional STD code:
Eg: +91984433 2233 ,+91-984433.2233 ,(+91)9844332233
All the above are valid phone numbers, your pattern should support for at least these many and more optional patterns if you can.

10. Extract all lines of length from a file whose length are
    i) length at least 5
    ii) length between 12 and 20
Usage Restriction: Only use grep, given file **emp.lst**

11. Display the all the filenames and numbers of the pattern “manager” present in all files present in the current directory and subdirectories from this level onwards.
(**in the files and directories provide to you**)

12. List all the employees who have salary between 7000 and 8000, whose name begins from s, from the salaries file given. (given file **salaries**)

13. Display the all the filenames and numbers of the pattern “student or teacher” present in all files present in the current directory and subdirectories from this level onwards. (**in the files and directories provide to you**)

14. In your current working directory, you would see a lot of files. (if there are no files, try creating at least 4 files and fill in random content in it)
Now your job is to write a command to find the second largest file (in terms of size) and copy that file to its parent directory.

SECTION 3
File Commands

1. Redirect output of ‘man echo’ to ‘echo.txt’ , use split command split echo.txt into 15 files each file with 2 character suffix in it and the suffixes should be numerals starting from 3.

2. Harry wants to copy all files from dir1 to dir2 that are not present in dir2.Write a command to do so.

3. Write a command/script to encrypt your name (your own encryption format) and write it to file “secretagent.txt”. Also write a command/script to decrypt it to help CID find out your name from your encrypted text file.
4. Display contents of 'LargeFile.txt' one screenful at a time and make sure that both forward and backward navigation allowed
5. Sort the content of 'Items.txt' in a single command and save the sorted content in that file only.
6. Deeksha went on a x days vacation during her internship. Now she is back but forgot on which files she was working on before going on vacation. Help her to find all the files on which she was working before going on vacation. **Explanation** : She went on vacation on 5th Sep, so she is looking for all the files which she modified/created on 4th Sep. **All her files will be only in Vmware folder.** Output should contain only those files present in Vmware folder, and before shooting the command change the PWD to Vmware folder.
7. Ross is in depression after knowing that his Carol is a lesbian. Chandler knows that Ross likes to solve puzzles, so everyday Chandler randomly selects a motivational code and encrypts the quote. Every quote is in small letters.
   He performs the following operations for encryption.

a. He replaces every character using below function.

```
String replace(char x)
{
        n= any random number.
        String str="";
        for (int i=0;i<n;i++)
        {
                str+=x;
        }

        Return str;
}
```

Example: word ‘am’ can be changed to something like this aaaaamm or ammmm or anything of the form XaYm (X times ‘a’ and Y times ‘m’,), where X and Y are any random numbers.

b. Inserts random digits in between quotes characters.
Eg. word ‘am’ can be changed to 434a4534m5435

c.Inserts random number of punctuations in between quotes characters.
Eg. word ‘am’ can be changed to !!a#!!##m!!#

d.Inserts random number of capital alphabets in between quotes characters.
Eg. word ‘am’ can be changed to AAaMMMFGmJADF

e. Replaces all small character using below encoding scheme.

a -> e
b -> f
c -> g
.
.
.
w -> a
x -> b
y -> c
z -> d

Your task is to decrypt the message present in secret.txt file.