PH 434 Programming Lab – Practical 1 (Date: 8 August 2025)

Please follow the guidelines VERY carefully. You are expected to complete all the tasks (challenge is optional) and show it to one of the TAs before you leave. They may ask you to implement/demonstrate the result and input the marks on the grade sheet. **It is your duty to ensure that marks have been noted at the end of the day.**

You are free to use your Notes to solve the problems. **Do not use the internet.** The TAs will assist you if you need some help.

Task#1:
   i)   Create the following folder and subfolder tree (case insensitive):

<div align="center">

Science

Physics   Chemistry   Maths

Midsem Endsem   Midsem Endsem   Midsem Endsem

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   ii)   Create a file called "marks.txt" in the subfolder **Science>>Chemistry>>Endsem** (use proper notation).

   iii)   Go to the **Science** folder, and using proper pathname, show/display the files contained in the **Science>>Chemistry>>Endsem** subfolder

Task#2:
   i)   Using "cat" function, create a file "marks.txt" under **Physics>>Endsem** and add the header text: Name Marks (separated by space)

   ii)   Write a bash script (save it as "grades.sh") in the above folder, which will allow you to input/enter the names and marks (out of 100) in the format -- Name Marks, whenever the script is implemented. The data is automatically saved in the file "marks.txt", created above. Add the name of five students and their marks.

   iii)   Go to the Science folder and show the contents of the file "marks.txt". It should look like this (actual names and marks can be different):

Name Marks
Rajesh 89
Afzal 88
Nilima 78
Ajay 86
Bharati 95

Task#3:

i) Change the name of the folder "**Maths**" to "**Mathematics**" (case insensitive)

ii) Copy the file "grades.sh" above to the **Mathematics>>Endsem** folder. Again using "cat" function, create a file "marks.txt" under **Mathematics>>Endsem** and add the header text: Name Marks. Run the bash script to add names and marks of the five students (use same names as in Task#2).

iii) Go to the Science folder, and using the "grep" function, search for all the scores of "Ajay"

Task#4:

i) Make a copy of the file "marks.txt" and call it "marks_with_roll.txt"

ii) Use a text editor such as Vim or gedit, to edit the file "marks_with_roll.txt" under the **Mathematics>>Endsem** folder by adding a column that contains the roll no. (DXXX) of the students, such as shown below:

Name Roll No. Marks
Rajesh D001   89
Afzal D230 88
Nilima D004 78
Ajay D435 86
Bharati D543 95

iii) Copy the file to the **Physics>>Endsem** folder and use the text editor to update the marks column with the marks in Physics contained in "marks.txt".

Task#5:

i) Write a bash script in the **Science** folder to solve the function $f(x, y) = x^2 + y^2 - 4xy$, for any two numbers input/given by the user. The output should read: **The solution for x = 8 and y = 2 is f = 4.**

Challenge:

Create two bash script "Add_marks.sh" and "Find_marks.sh" in the Science folder.

The first script allows you to automate the entire process of adding marks. It should be able to create/add to a text file containing the marks of students in Subject ("Physics, "Chemistry" etc.) subfolder, for either exam ("Midsem,"Endsem"). The text file should be called "subject_exam_marks.txt" (where subject and exam should be the one chosen by the user as an Input). The text file should contain Name Roll number and Marks, separated by a comma. The second script should allow you to read the marks obtained by students saved in the textfile of any subfolder. For example, what were the marks obtained by students in midsems in Chemistry.