Lab Activity 2 - SHELL

Software System Development – Monsoon 2023

Due Date: 16 August 2023, 05:00 pm

Instructions:

- Deadline mentioned during the Lab is strictly immutable. No extensions will be given.
- Any naming convention mentioned in the lab activity must be followed strictly or marks may be deducted for the same.
- Any plagiarized content will fetch zero marks for the current lab and will be followed by strict action against the students involved. However, discussion of ideas is allowed.

Submission Criteria:

- Create a folder with your **roll number as its name** and containing the following files corresponding to the questions:
  - **<roll_number>_q1.sh**
  - **<roll_number>_q2.sh**
  - **<roll_number>_q3.sh**
  - **README.md**
- Compress the folder as a zip file **(name should be <roll_number>.zip)** and then upload it on the Moodle before deadline.
- **README.md** should contain steps for execution of your script and any extra information that you want the evaluator to know before running your script, such as dependencies on some external tools or libraries.
- For Example:

2022201079.zip

|____2022201079

|____2022201079_q1.sh

|____2022201079_q2.sh

|____2022201079_q3.sh

|____README.md

Question 1: (10 Marks)

Write a bash script to print complex pyramid structures, where ‘n’ is the number of rows in each pyramid. No pyramid should be printed if ‘n’ is even.

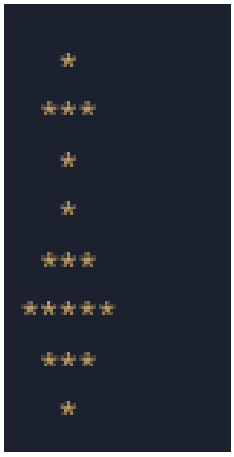
Example:

Input:

3

3 6 5

Output:



Explanation for Sample Input 1:

The first line of the input contains a single integer ‘T’ representing the number of pyramids to be printed.

The second line of the input will have ‘T’ space separated integers representing the no. of rows in each pyramid.

Explanation for Sample Output 1:

- For n=3, it prints the first 3 rows:

- For n=6, it prints nothing as it is even,
- For n=5, it prints the next 5 rows:

Question 2: (10 Marks)

Write a bash script that takes a directory path as input and prints list of all files/directories in the long format that satisfy the following conditions:

- **User** has all permissions (read,write,execute)
- **Group** does not have read and execute permissions
- **Other** has at least execute permission

• Input Constraints – The path will be a valid directory path (can be absolute or
relative)
• Output Constraints – Print the long format of the files/directories matching the condition.

Example:
Input: ./2022202023_q2.sh Dir_Path
Output:

```
-rwx----wx 1 anurag anurag    0 Aug  7 23:12 file2.txt
drwx-----x 2 anurag anurag 4096 Aug  7 23:13 folder1
```

Question 3: (10 Marks)

Background:

You wanted to become an SSD TA but due to some unfortunate chain of events, you landed yourself the position of DSAPS TA. Now you have all the submissions (of all the students) for assignment 1 and it is your task to make sure no one has used prohibited libraries.

For the unversed, all the libraries that need to be included in a “cpp” file always start with a “#include” and each library needs to be included in a new line.

For example:

```cpp
#include<iostream>
#include<unordered_map>

using namespace std;

int main(){
    return 1;
}
```

Fig1. A cpp file named prog1.cpp

In Fig1, there are 2 libraries included in the code - “iostream” and “unordered_map”(at line 1 and line 2). Each of them have to be included in new line and start with the phrase “#include”.

Your Task:

You know the path to the directory which contains all the “cpp” files. You have to create a shell script to display all the libraries (that is, all the lines containing the phrase “#include”) on your terminal.

Important constraints:

- The directory may contain other files than cpp files.
- The directory which contains all the cpp files will be a command line argument (use $1).
- You have to go through all the files ending with cpp in the directory.
- Assume you have all the necessary permissions (read, write and execute)

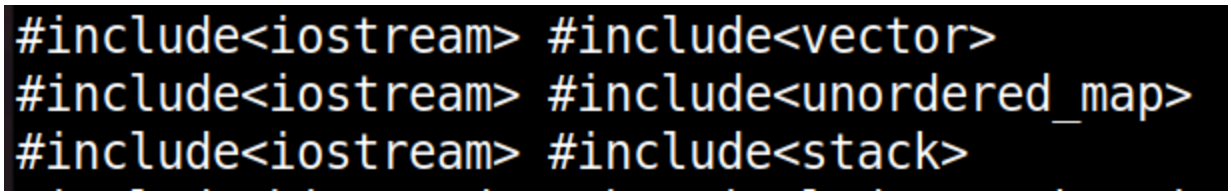
Input:

```
:~/Desktop$ ./test.sh ~/Desktop/dsaps/
```

The file name is test.sh .

The directory path is “~/Desktop/dsaps”.

Output:



Explaining output:

There were only 3 cpp files and the 1st cpp file had “iostream” and “vector” as libraries. Similarly for file2 and file3, the results are displayed.