Assignment 8

Computer Systems Lab

Assignment Date: November 5, 2020   **Date of Submission**: November 11, 2020

1. Write a program that takes as input an array A of n non-negative integers and prints a histogram (with vertical orientation) using '#' character, without using extra storage (such as a 2-D array).

   Example

   Input:

   ```
   n = 7
   A = {2, 4, 6, 1, 3, 0, 5}
   ```

   Output:

   ```
       #
       #     #
      ##     #
      ## # #
    ### # #
    ##### #
   ```

2. Given a two dimensional array A of $m \times n$, print the array elements that appear in the spiral order.

   Input:

   ```
   m = 3 n = 4
   A = {2, 4, 6, 1},
       {3, 0, 5, 2},
       {6, 3, 9, 3}};
   ```

   Output:

   ```
    2 4 6 1 2 3 9 3 6 3 0 5
   ```

3. Given prices `Price[]` and volumes `Volume[]` of `n` different indivisible items, you are asked to put them into a knapsack of volume `Capacity` such that the total price of the items is maximized. Note that the total volume of all the items must be less than or equal to the volume of the knapsack.

   Input:

   `n` = 3

   `Price[]` = {600, 100, 120}

   `Volume[]` = {10, 20, 30}

   `Capacity` = 50

   Output: 720

4. Given a string `str` and a pattern `pat` that consists of uppercase English alphabets [A-Z], write a C program that finds the number of ways the pattern `pat` appears as a subsequence in the string `str`.

   Input:

   `str[]` = AABACA

   `pat[]` = AA

   Output: 6

Submission Instruction:

File Name: A8_RollNo.c/cpp
Email to: *joy@iitbbs.ac.in* with **subject line**: A8_RollNo