Introduction to C++ programming
Exam – Part 2 (version B)

Exercise 1. Write a C++ function that displays on the screen the following drawing:

```
    x
    x
    x
 xxxxxxx
    x
    x
    x
```

The function should be capable of displaying any such drawing consisting of any odd number of lines. Write a simple test program that ask the user to enter the number of lines and then displays the corresponding drawing.

Exercise 2. Define a C++ class called **IntVector** for representing vectors of integers of arbitrary size. Consider the following specifications. The user of the **IntVector** data type should be able to:

- create vectors of arbitrary size n

- display a vector through the **cout** command and with the following format:

$$\text{vector=[2, 5, 13, 12, 4, 9, 5, 3, 2, 1, 6]}$$

  i.e. the elements of the vector are displayed as comma-separated list of values enclosed between square brackets,

- to determine the index of the max and min element of the array

- to sort the elements of the array in decreasing order

- to determine the largest sub-vector of decreasing elements and return their sum. For example for vector

$$\text{v=\{2, 5, 13, 12, 4, 9, 5, 3, 2, 1, 6\}}$$

  the largest sub-vector of decreasing elements contained in **v** is **[9 5 3 2 1]** and its sum is $9+5+3+2+1 = 20$.

Write a simple **main** to test the **IntVector** class by creating an **IntVector** object and display it on the screen, find its min and max, sort it and display the largest subvector of decreasing elements.