Tutorial of week 13 (heap)

Instruction:
This tutorial is grading-based.

Tasks:

1. (18 pts, difficulty level 4/10.) Given an array H, check whether it is a max heap or not

   Inputs: Read from a file that contains n integers $x_1, x_2, \ldots, x_n$, which represent an array-based **complete binary tree**.

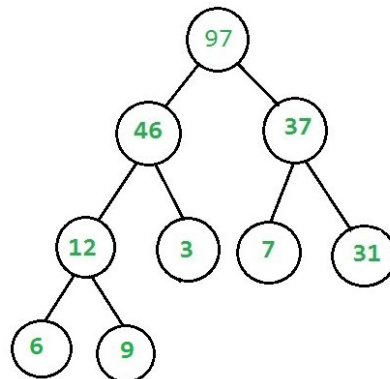   **Output**: whether the given array is a max-heap or not.

   Requirement: your code should have **linear time O(n).** You should use vector<int> for this heap (easier to read the input file). The sample codes for tutorial week 11 will be helpful.

   Example 1.
   Input: 97 46 37 12 3 7 3 6 9
   For this output, your program should output: Yes, it is a heap.
   Below you can find the tree view.

   Example 2:
   Input: 10 20 9 4 5 6 7
   Your program should output: This is not a heap

```
          10
         /  \
        20    9
       / \   / \
      4   5 6   7
```