Q1 // Mr. Ing's New Math Curve

The grade 12s are doing really bad (getting negative marks) on Math Tests and Ing is devising a new marking scheme. He will take the maximum sum of a range of consecutive marks on tests and make that the report card mark. For example given the array of test marks :

{4, -5, 4, -3, 4, 4, -4, 4, -5}

The largest maximum sum of a range of marks would be 9 when you take the sum from index 2 to index 7 (inclusive).

Input Specification:
The input will consist of an integer N (1<=N<=10,000.000) representing the number of tests that Ing has given followed by N test scores in the order that they were written.

Output Specification:
Output mark that Mr. Ing puts on the report card (some people like Zhehai can get above 100 while others like Noor can get below 0).

Sample Input:

```
9
4
-5
4
-3
4
4
-4
4
-5
```

Sample Output:

```
9
```

Q2 // The Physics Funds

Zhehai and his Physics group are going to Michaels in order to buy popsicle sticks for their trebuchet project. However, they really care about efficiency as they just learned about efficiency from Mrs. Mohan. In order to be quick, Zhehai already knows the amount of money he needs before going to the store. Zhehai wants to find the fewest number of coins he needs to take to get the popsicle sticks he needs.

Input Specification:
The input will consist of two integers, N (1<=N<=1000) and M (1<=M<=10000), separated by a space. N is the amount of coin denominations Zhehai has and M is the amount of money Zhehai needs to spend at Michaels. The following N lines will consist of coin denominations representing the value of each coin Zhehai has. If Zhehai has a specific coin denomination, you can assume he has an infinite number of those coins (he is very rich).

Output Specification:
Output the fewest number of coins Zhehai can take with him to buy the materials or **-1** if Zhehai cannot reach the exact amount he needs.

Sample Input:

```
3 10
1
4
5
```

Sample Output:

```
2
```

Sample Input:

```
3 6
1
3
4
```

Sample Output:

```
2
```

Q3 // Mr. McKenzie's Seating Plan

Mr. Mckenzie likes to see the faces of all the students in his class; therefore, when he makes his seating arrangement he likes it to be in an order such that the students sit in ascending order of their height. However, with schedules changing back and forth everyday, Mr. McKenzie has given up. He just wants to know how many people's faces he can see and the heights of those people.

Input Specification:
The input will consist of an integer N (1<=N<=10000), the number of students, followed by N lines with each line having the height of the student.

Output Specification:
Output the size of the largest increasing subsequence of the student heights. On the next line, output the elements of that subsequence separated by a space. If there is more than one, print the first one that would appear in a linear search starting from index 0.

Sample Input:

```
11
-7
10
9
2
3
8
8
1
2
3
4
```

Sample Output:

```
5
-7 1 2 3 4
```