The Maximum Subarray

by sh4d0wkn1ght

Given an array $A = \{a_1, a_2, \ldots, a_N\}$ of N elements, find the maximum possible sum of a

1. Contiguous subarray
2. Non-contiguous (not necessarily contiguous) subarray.

Empty subarrays/subsequences should not be considered.

This Youtube video by Ben Wright might be useful to understand the *Kadane algorithm* for the maximum subarray in a *1-D* sequence.

Algorithms: Maximum Contiguous Subarray Problem O(...

Input Format

First line of the input has an integer T. T cases follow.
Each test case begins with an integer N. In the next line, N integers follow representing the elements of array A.

Constraints:

- $1 \leq T \leq 10$
- $1 \leq N \leq 10^5$
- $-10^4 \leq a_i \leq 10^4$

The subarray and subsequences you consider should have at least one element.

Output Format

Two, space separated, integers denoting the maximum contiguous and non-contiguous subarray. At least one integer

should be selected and put into the subarrays (this may be required in cases where all elements are negative).

Sample Input

```
2
4
1 2 3 4
6
2 -1 2 3 4 -5
```

Sample Output

```
10 10
10 11
```

Explanation

In the first case:
The max sum for both contiguous and non-contiguous elements is the sum of ALL the elements (as they are all positive).

In the second case:
[2 -1 2 3 4] --> This forms the contiguous sub-array with the maximum sum.
For the max sum of a not-necessarily-contiguous group of elements, simply add all the positive elements.

Related Topics

Dynamic Programming Basics

Submissions: 19781

Max Score: 50

Difficulty: Easy

More

Current Buffer (saved locally, editable) Java 8

```
1  import java.io.*;
2  import java.util.*;
3
4  public class Solution {
5
6      public static void main(String[] args) {
7          /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named
   Solution. */
8      }
9  }
```

Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code