

GSS5 - Can you answer these queries V

You are given a sequence $A[1], A[2], \dots, A[N]$. ($|A[i]| \leq 10000$, $1 \leq N \leq 10000$). A query is defined as follows: $\text{Query}(x1,y1,x2,y2) = \text{Max} \{ A[i]+A[i+1]+\dots+A[j] ; x1 \leq i \leq y1 , x2 \leq j \leq y2 \text{ and } x1 \leq x2 , y1 \leq y2 \}$. Given M queries ($1 \leq M \leq 10000$), your program must output the results of these queries.

Input

The first line of the input consist of the number of tests cases ≤ 5 . Each case consist of the integer N and the sequence A . Then the integer M . M lines follow, contains 4 numbers $x1, y1, x2, y2$.

Output

Your program should output the results of the M queries for each test case, one query per line.

Example

Input:

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

Output:

```
2
3
1
```