Can you answer these queries V

You are given a sequence A[1], A[2], ..., A[N] . (|A[i]| <= 10000 , 1 <= N <= 10000). A query is defined as follows: Query(x1,y1,x2,y2) = Max { A[i]+A[i+1]+...+A[j] ; x1 <= i <= y1 , x2 <= j <= y2 and x1 <= x2 , y1 <= y2 }. Given M queries (1 <= M <= 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
```