Problem K

Lovers II

One day n girls and m boys come to Xi'an to look for a mate. Each girl has a value and the value of the i-th one is denoted by $a[i]$. Each boy has a value as well and the value of the j-th one is denoted by $b[j]$. The i-th Girl and the j-th boy can fall in love with each other if and only if $a[i]+b[j]>=k$ for a known coefficient k.

Here we consider several queries above them. In each query, you are asked to judge that if it is possible for all girl only considering boys labeled from L to R that they can all find their own lovers without repetitive choices.

Input

First line contains an integer T $(1<=T<=3)$, indicating the number of test cases.

Then T test cases follows. In each test case the first line contains three integers n, m and k where $1<=n<=100000$, $1<=m<=200000$ and $0<=K<=10^9$. The second line has n integers indicating the values $a[1]$ to $a[n]$ $(0<=a[i]<=10^9)$. The third line has m integers indicating the values $b[1]$ to $b[n]$ $(0<=b[i]<=10^9)$.

Then the fourth line contains an integer q $(1<=q<=100000)$ which is the number of queries.

Each of the following q lines provides two integers L and R $(1<=L<=R<=m)$ corresponding to a query.

Output

For each query, output "1" if girls can find their own lovers, or "0" if not.

Sample Input	Sample Output
1 3 4 5 1 1 1 4 4 4 3 2 1 3 2 4	1 0