You have a sequence of length n. The element of this sequence is seq[i] ($i = 1$ to n).

Now consider a function

$F(k, a, b) = \sum \text{seq}[i] * (i - a + 1)^k$ for each i between a to b inclusive.

Given a sequence of length n you have to calculate $F(k, a, b)$.

Input

First line contains T ($1 \leq T \leq 5$) the number of test cases. Then T test cases follow.

The first line of each test case contains an integer n ($1 \leq n \leq 100000$).

The next line contains n integers seq[1] to seq[n]. Each of these integer is in the range from 0 to 1000000000 inclusive.

Next line contains an integer q ($q \leq 10000$) the number of queries.

Each of the next q lines contains 3 integers k,a,b. k is between 0 to 20 inclusive. $1 \leq a \leq b \leq n$.

Output

For each of the query k,a,b output contains 1 integer in each line the value of $F(k, a, b)$ mod 1000000009.

Sample Input

```
2
10
1 2 4 5 1 3 6 7 8 4
5
1 3 7
0 3 7
2 3 7
3 3 7
4 3 7
10
3 6 7 8 4 1 2 4 5 1
5
1 3 7
0 3 7
2 3 7
3 3 7
4 3 7
```

Sample Output

```
59
19
231
1013
4683
49
22
141
493
1965
```