

You are given a Vector  $\mathbf{V}$  and Matrix  $\mathbf{M}$ .  $\mathbf{V}$  has  $n$  variables  $V_1, V_2, \dots, V_n$ .  $\mathbf{M}$  is lower triangular matrix with  $n$  rows numbered from 1 to  $n$ . Row  $i$  has  $i - 1$  column. You can calculate an infinite matrix  $\mathbf{R}$  by the following equation.

$$R_{i,j} = \begin{cases} (R_{i-1,j} + \sum_{k=1}^{j-1} i^{M_{j,k}} * R_{i,k}) \% m & \text{if } i > 1 \\ V_j & \text{if } i = 1 \end{cases}$$

The matrix  $\mathbf{R}$  has  $n$  columns and infinite rows. Now consider about a function  $S_{p,a,b,c,d}$ . You can calculate this by the following equation.

$$S_{p,a,b,c,d} = \left( \sum_{i=0}^c \sum_{j=0}^d (i+1)^p * R_{i+a,j+b} \right) \% m$$

For our problem the value of  $m$  is 1000000007. This is a prime number. Your task is to given  $\mathbf{V}$  and  $\mathbf{M}$  you have to calculate  $S_{p,a,b,c,d}$ .

## Input

First line contains  $T$  ( $1 \leq T \leq 5$ ) the number of test cases. Each test case contains multiple number of lines.

Line 1 contains 1 integer  $n$  ( $1 \leq n \leq 200$ ). Line 2 to Line  $n + 1$  contains the information about  $\mathbf{V}$  and  $\mathbf{M}$ .

Among these lines Line  $i + 1$  contains  $i$  integers.

First integer is the value of  $V_i$  ( $1 \leq V_i \leq 200$ ). Subsequent integers are  $M_{1,i}, M_{2,i}, M_{3,i}, \dots, M_{i-1,i}$  in order. ( $0 \leq M_{i,j} < \min(10, j - i)$ ).

Line  $n + 2$  contains an integer  $q$  ( $1 \leq q \leq 1000$ ) the number of queries. Each of the next  $q$  lines contains 5 integers  $p$  ( $0 \leq p \leq 9$ ),  $a$  ( $1 \leq a \leq 10^{15}$ ),  $b$  ( $1 \leq b \leq n$ ),  $c$  ( $0 \leq c \leq 10^{15}$ ),  $d$  ( $0 \leq d \leq n - b$ ) separated by a single space.

## Output

For each query output a single integer denoting the value  $S_{p,a,b,c,d}$ . Output a blank lines after each test case.

## Sample Input

```
2
4
1
2 0
3 1 0
4 2 1 0
4
0 1 1 5 3
0 2 2 5 2
1 2 2 10 2
1 2 3 10 1
4
1
2 0
3 1 0
4 2 1 0
4
0 1 1 5 3
0 2 2 5 2
1 2 2 10 2
1 2 3 10 1
```

## Sample Output

```
910
1468
79156
78518
```

```
910
1468
79156
78518
```