Infinite Matrix

Input: Standard Input
Output: Standard Output

You are given a Vector V and Matrix M. V has n variables $V_1, V_2, \ldots, V_n$. 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 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 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 V and 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 V and M. Among these lines Line i+1 contains i ingers.

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

Line n+2 contains an integer q($1 \leq q \leq 1000$) the number of queries. Each of the next q line 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

Sample Input	Output for Sample Input
2	910
4	1468
1	79156
2 0	78518
3 1 0	
4 2 1 0	910
4	1468
0 1 1 5 3	79156
0 2 2 5 2	78518
1 2 2 10 2	
1 2 3 10 1	
4	
1	

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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
```