We are given the following sequence of numbers:

$a\_{n}=a\_{n-1}⊕\left(a\_{n-1} mod 10^{p\_{n}}\right)$,

where the operator ⊕ denotes addition without transfer. For instance, 1 ⊕ 9 = 0; 25 ⊕ 26 = 41; 320 ⊕ 420 = 740 (as a clarification we could mention that adjacent digits do not influence each other).

Given the number а1 and the sequence {pn}, n∈[1, N], your program must process Q queries: output the i-th digit of aj from right to left and swap the values of p1 and pj.

**Input**

The first line of the input file sequence.in contains the integer а1. The second line specifies the number N. The third line contains N integers pn. On the next line, the number Q is written. The last Q lines contain pairs of numbers i, j, satisfying the constraints 1 ≤ j ≤ N, i is correctly defined.

**Изход**

In the output file sequence.out for each query write the found digit on a separate line.

**Constraints**

1 ≤ *N* ≤ 105

1 ≤ *Q* ≤ 104

0 ≤ p*n ≤ 106*

а1 has no more than 5.105 digits

**Time limit: 2.5 sec**

**Memory limit: 256 MB**

**Example**

|  |  |
| --- | --- |
| **Input (sequence.in)** | **Output (sequence.out)** |
| 12352 3 1 2 341 32 22 53 4 | 2461 |