

8520 Acedia

You are given a sequence of n numbers, the k -th number is $a[k]$.

You need to answer m queries.

Each query is: for each k from 1 to 10, calculate the number of valid pairs $(x, x + k - 1)$ in range $[l, r]$.

We call a pair (x, y) valid when:

1. For each i from x to y , there exists at least one element in range $[l, r]$ which is equal to i .
2. There is no element in range $[l, r]$ which is equal to $x - 1$ or $y + 1$

Input

The input contains multiple test cases.

The first line contains a number T ($1 \leq T \leq 5$) denoting the number of test cases. In each test case:

- The first line contains two numbers n, m . ($1 \leq n, m \leq 1000000$)
- Then one line contains n numbers indicates $a[1] \dots a[n]$. ($0 \leq a[i] \leq 2000000000$)
- The following m lines each contains two numbers l, r denoting a query in range $[l, r]$. ($1 \leq l \leq r \leq n$)

Output

For each query you need to output 10 numbers, in order to reduce the amount of output, you just need to output each number mod10, without space.

For each test case, output m lines.

The k -th line contains a string of length 10 indicating the answers of the k -th query.

Input Sample

```
1
5 5
1 2 4 5 6
1 5
1 2
3 4
3 5
4 5
```

Sample Output

```
0110000000
0100000000
0100000000
0010000000
0100000000
```