Decimal Array Expansion

locked

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Watson has a sequence string A of size n. He is jealous of his sister whose sequence string is of size m. So, he uses a technique which he discovered to expand his sequence string. The technique is as follows:

For each digit $j, 0 \leq j \leq 9$, there's a replacement sequence S_j. To expand a sequence string B of size x. He replaces each digit B_i with it's replacement sequence S_{B_i}. So, the new sequence B' becomes $S_{B_1} S_{B_2} S_{B_3} \ldots S_{B_x}$, i.e the concatenation of $S_{B_1}, S_{B_2}, S_{B_3}, \ldots, S_{B_x}$.

An example is shown below:

Replacement Rules

$S_0 \rightarrow 12$	$S_1 \rightarrow 32$	$S_2 \rightarrow 41$	$S_3 \rightarrow 69$	$S_4 \rightarrow 00$
$S_5 \rightarrow 43$	$S_6 \rightarrow 91$	$S_7 \rightarrow 51$	$S_8 \rightarrow 18$	$S_9 \rightarrow 19$

B : 34 (Initial Sequence)
B' : 6900 (After applying expansion 1 times)
B'' : 91191212 (After applying expansion 2 times)
B''' : 193232193241324 1 (After applying expansion 3 times)

Watson repetitively applies the expansion algorithm to his sequence A in order to increase its size to at least m.

Note: Watson will stop expanding his sequence when its size even becomes at least the size of his sister's sequence.

Now, his sister asks him to answer q queries. For the i-th query he needs to tell her the sum of digits between indexes l_i and r_i in his final sequence.

Input Format

In the first line, there are three space-separated integers n, m and q.

In the second line, there's a string of size n denoting the initial sequence string A.

In the third line, 10 strings follow seperated by a space. The i-th of them, starting from 0, contains a replacement rule for digit i, i.e. S_i.

Next, q lines follow. The i-th of them contains two space-separated integers denoting l_i and r_i for the i^{th} query.

Constraints

- $1 \leq n, q \leq 10^5$
- $1 \leq m \leq 10^{17}$

- $0 \leq A_i \leq 9$
- $2 \leq len(S_j) \leq 9, \forall (0 \leq j \leq 9)$
- $1 \leq l_i \leq r_i \leq m$

Output Format

Print exactly q lines. In the i-th of them print exactly one integer denoting the answer to the i-th query.

Sample Input 0

```
2 14 2
34
12 32 41 69 00 43 91 51 18 19
1 4
3 8
```

Sample Output 0

```
15
20
```

Explanation 0

The image provided in the problem statement illustrates this sample case.


```
#!/bin/python3

import math
import os
import random
import re
import sys

#
# Complete the 'initialize' function below.
#
# The function accepts following parameters:
#  1. INTEGER n
#  2. LONG_INTEGER m
#  3. STRING A
#  4. STRING_ARRAY S
```