CS2810 OOAIA : A12

Star Time - Apr 13 at 14:00 on Hackerrank

Deadline: Apr 15 at 23:45 on Hackerrank

Contest Link - https://www.hackerrank.com/a12-1

Problem Statement -

As you know, the world is suffering from Covid-19. Teams of scientists are currently working on developing vaccines for this deadly disease.

Chandu being a medical sciences student, is currently working on studying the history of corona viruses. He found out that viruses evolve. Each virus has a **DNA sequence** (which can be represented by a sequence of uppercase characters). Whenever a virus evolves, some of the DNAs in the sequence **gets modified**.

Chandu found out that corona viruses have a particular DNA sequence **X,** of length **N**. Chandu is working on a medicine **V** of length **M** (medicine is also represented as a sequence of uppercase characters). The medicine V can be used to cure covid-19 only if the DNA sequence X of the virus contains within it the DNA sequence of the medicine and the number of such occurrences (**C1**) is atleast **K** i.e. medicine V will cure the disease X if V is a substring of X and number of occurrences of V in X is **greater than equal to K**.

Also the virus X has evolved and a new virus Y has been generated. The evolution happens in the following way -

X(1...N) is the old DNA sequence. Evolution happens in **Q** stages. In the i_{th} stage, **each character** of the substring X(L...R) gets rotated by s_i characters (1<=L,R<=N). Rotation of a character c by s_i means shifting c by s_i characters towards right in the alphabet sequence (which involves looping back from 'Z' to 'A' if needed)

For Example -

1) Rotating 'A' by 1 gives 'B'.
2) Rotating 'D' by 5 gives 'I'.
3) Rotating 'Y' by 4 gives 'C'.
4) Rotating 'A' by 30 gives 'E' and so on.

X undergoes Q such evolutions and we obtain Y. Now chandu wants to find if the same medicine V will work on the new virus Y i.e. if number of occurrences of V in Y **(C2)** is atleast K.

Chandu finds this task difficult. Since Chandu is your friend, you need to help him find the string Y and whether the medicine will cure X and Y.

Input Format

First line of input contains the number of test cases **T.**

For each test case, the first line contains the DNA sequence of the initial virus **(X).**

Next line contains the DNA sequence of the medicine **(V).**

Next line contains a single integer **K.**

Next line contains a single integer **Q**, the number of evolutions to be performed on X.

Each of the next Q lines contains three integers L_i**,** R_i and s_i, such that each character of X(L_i... R_i) gets rotated by s_i characters(1<=i<=Q)

Output Format

For each test case, output will contain three lines.

First line contains a string **YES** if medicine V can cure the disease X and **NO** if the disease can not be cured.

Next line contains the count of occurrences of V in X **(C1)**.

Next line contains the DNA sequence **Y**.

Next line contains a string **YES** if medicine V can cure the disease Y and **NO** if the disease can not be cured.

Next line contains the count of occurrences of V in Y **(C2)**.

Constraints

1 <= T <= 10

1 <= N <= 10^5 (N is the length of string X)

1 <= M <= 10^5 (M is the length of string V)

1 <= Q <= 10^5

1 <= K <= 10^5

Sample Test case

Input 1 -

1

ABBBCBBBBD

BBB

2

2

1 1 4

8 10 1

Output 1 -

YES

3

EBBBCBBCCE

NO

1

Explanation -

String\Index	1	2	3	4	5	6	7	8	9	10
X	A	B	B	B	C	B	B	B	B	D
After First Modification	**E**	B	B	B	C	B	B	B	B	D
After Second modification(Y)	E	B	B	B	C	B	B	**C**	**C**	**E**

X has three occurrences of substring V i.e. X(2..4), X(6..8) and X(7..9) matches V. Since 3>=2, the answer is **YES.**

Y has only one occurrence of substring V and hence the answer is **NO.**

Note - Two substrings are considered different if they have at least one non common index. Also substring X(L..R) includes both L and R also.