Problem J. First strip

Ballon:	
Time limit:	1 seconds
Memory limit:	512 megabytes

In order to win **Yen Nhi's** heart, **Quang Tri** accepts a brain-tricky challenge from her. **Yen Nhi** draws on the floor a strip of n consecutive squares (called the first strip). The squares are numbered 1 to n from left to right. For each square, **Quang Tri** has to choose either the color red or blue to paint it. Note that all squares must be colored in a certain color, i.e, **Quang Tri** cannot leave any square blank.

Yen Nhi has n pens with red ink and n other pens with blue ink to support **Quang Tri**'s coloring process. Each pen is filled with enough ink to fill exactly a single square with the corresponding color. **Yen Nhi** stipulates that **Quang Tri** initially has 0 points, and if he wants to get i **red-ink** pens, a_i points will be deducted from his score. Similarly, **Quang Tri**'s score will have b_j points deducted if he wants to take j **blue-ink** pens from **Yen Nhi**. Note that $a_0 = b_0 = 0$.

Also, **Yen Nhi** gives **Quang Tri** a special rule to get more points. She has another strip of squares of length m (called the second strip) and all the squares are already colored either red or blue. For each contiguous segment of length m in the first strip whose coloring coincides with the second strip, **Quang Tri** will receive D points. Tri wants to find a way to color the first strip to maximize his final score (so he can make a good impression on **Yen Nhi**). Let's help **Quang Tri** compute the optimal solution!

Note that a segment's coloring is considered "coincided" with another segment's coloring if there does not exist a pair of squares with the same index (from left to right) in both segments but have different color.

Input

The first line contains three integers n, m, and D, $(1 \le n \le 2000, 1 \le m \le min(n, 10), 1 \le D \le 10^6)$. n and m is the length of the first and second strip, respectively. D is the bonus amount **Quang Tri** can obtain for each contiguous segment of the first strip whose coloring coincides with the second strip.

The second line contains n integers $a_1, a_2, \ldots, a_n$, $(1 \le a_i \le 10^9)$.

The third line contains n integers $b_1, b_2, \ldots, b_n$, $(1 \le b_i \le 10^9)$.

The fourth line contains a string of length m whose each character is either 'R' or 'B' representing that the corresponding square of the second strip is colored with the color red or blue.

Output

Print two lines, the first line contains the maximum final score that **Quang Tri** can obtain, and the second line contains a string of length n representing his coloring solution: $i - th$ character is 'R' if the $i - th$ square in the first strip is colored with red, and is 'B' otherwise. If there are multiple valid answers, you can output any of them.

Examples

standard input	standard output
6 2 1 1 2 3 4 5 6 6 5 4 3 2 1 RR	-1 RRRRRR
6 2 4 1 2 3 4 5 6 6 5 5 3 2 1 RB	4 RBRBRB
6 2 3 1 2 6 4 5 6 6 5 4 3 2 1 RB	1 RBRBBB

Note

In example 1, two possible ways that **Quang Tri** can color the first strip to achieve -1 points:

Quang Tri uses 6 red-ink pens. There are 5 contiguous segments whose coloring coincides with the second strip.

Final score $= -a_6 - 0 + 5 * D = -6 + 5 = -1$.

Quang Tri uses 6 blue-ink pens. There are 0 contiguous segments whose coloring coincides with the second strip.

Final score $= -0 - b(6) + 0 * D = -1$.