



# Mixing proteins

by [shaka\\_shadows](#)

Problem

Submissions

Leaderboard

Discussions

Editorial

Some scientists are working on protein recombination, and during their research, they have found a remarkable fact: there are 4 proteins in the protein ring that mutate after every second according to a fixed pattern. For simplicity, proteins are called **A, B, C, D** (you know, protein names can be very complicated). A protein mutates into another one depending on itself and the protein right after it. Scientists determined that the mutation table goes like this:

	A	B	C	D
A	A	B	C	D
B	B	A	D	C
C	C	D	A	B
D	D	C	B	A

Here rows denote the protein at current position, while columns denote the protein at the next position. And the corresponding value in the table denotes the new protein that will emerge. So for example, **if protein i is A, and protein i + 1 is B, protein i will change to B**. All mutations take place simultaneously. The protein ring is seen as a circular list, so last protein of the list mutates depending on the first protein.

Using this data, they have written a small simulation software to get mutations second by second. The problem is that the protein rings can be very long (up to 1 million proteins in a single ring) and they want to know the state of the ring after upto  $10^9$  seconds. Thus their software takes too long to report the results. They ask you for your help.

## Input Format

Input contains 2 lines.

First line has 2 integers **N** and **K**, **N** being the length of the protein ring and **K** the desired number of seconds.

Second line contains a string of length **N** containing uppercase letters **A, B, C** or **D** only, describing the ring.

## Output Format

Output a single line with a string of length **N**, describing the state of the ring after **K** seconds.

## Constraints

$$1 \leq N \leq 10^6$$

$$1 \leq K \leq 10^9$$

## Sample Input:

```
5 15
AAAAAD
```

## Sample Output:

```
DDDDA
```

## Explanation

The complete sequence of mutations is:

AAADD  
AADAD  
ADDDD  
DAAAD  
DAADA  
DADDD  
DDAAA  
ADAAD  
DDADD  
ADDAA  
DADAA  
DDDAD  
AADDA  
ADADA  
DDDDA

f t in

Submissions: [318](#)

Max Score: 80

Difficulty: Hard

Rate This Challenge:

☆☆☆☆☆

[More](#)

Current Buffer (saved locally, editable)  

Java 7



```
1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }
```

Line: 1 Col: 1

 [Upload Code as File](#)

☐ Test against custom input

Run Code

Submit Code

Join us on IRC at [#hackerrank](#) on freenode for hugs or bugs.

[Contest Calendar](#) | [Blog](#) | [Scoring](#) | [Environment](#) | [FAQ](#) | [About Us](#) | [Support](#) | [Careers](#) | [Terms Of Service](#) | [Privacy Policy](#) | [Request a Feature](#)