Julius Caesar Cipher

Julius Caesar used a system of cryptography, now known as Caesar Cipher, which shifted each letter 2 places further through the alphabet (e.g. 'A' shifts to 'C', 'R' shifts to 'T', etc.). At the end of the alphabet we wrap around, that is 'Y' shifts to 'A'.

We can, of course, try shifting by any number. Given an encoded text and a number of places to shift, decode it.

For example, "HELLOWORLD" shifted by 4 places will be encoded as "LIPPSASVPH". In other words, if given (quotes for clarity) "LIPPSASVPH" and 4 as input, you will print "HELLOWORLD".

Input

The first line is the number of test cases **T** (**T** ≤ 1,000). Then **T** test cases follow.

Each test case consists of a word and an integer, separted by a space, in a single line, denoting the **word** to decode and the **shift**, respectively.

Each character of the **word** is an uppercase letter from 'A' to 'Z' and the **shift** is between 0 and 25 inclusive.

The **word** has up to 1,000 characters.

Output

For each test case print the decoded word in a single line in the format given by the examples.

Example

Input:
2
LIPPSASVPH 4
DBNPCBQ 1

Output:
Test Case #1: HELLOWORLD
Test Case #2: CAMOBAP