17 - DECODER RING

A decoder ring consists of two adjacent dials and is used to encrypt (or decrypt) messages. The two dials are lined up, so that each position on the first is touching one on the second, and dials can rotate so that they can be aligned in different ways. The first dial has 26 positions, lettered from A to Z in order, and the second dial has the same letters but not necessarily in the same order. A letter is encrypted by finding it on the first dial and using the corresponding touching letter on the second dial.

For example, suppose that the second dial has been lettered from Z to A (i.e. reverse order) and that the A on the first dial is touching Z on the second:

- The letter A would be encrypted to the letter Z, the letter B by the letter Y etc.
- If the second dial is now rotated until the A on the first dial is touching X on the second, the letter A would be encrypted to the letter X, the letter B by W etc.

The order of the letters on the second dial will be generated as follows, from the number n:

- Place the letters A to Z clockwise in order around a circle;
- Starting with A count clockwise round the circle until n is reached;
- Remove the selected letter from the circle — it becomes the first letter on the second dial;
- Starting from where you left off, count to n again to select the next letter;
- Continue until all the letters have been selected.

For example, if n is 5 the letters will be chosen in the order: E, J, O, T, Y, D, K, Q, W…

The dials will be aligned so that the first letter selected for the second dial is initially touching the letter A on the first dial, the second letter selected touching B etc. After each rotation of the dials, the letter on the second dial previously touching B on the first dial will be touching A on the first dial, etc.

A word is encoded by encrypting each letter in turn, after each encryption rotating the dial by a single position. For example, if n is 5 the word ABCD will be encrypted as EOYK.

Task

Write a program that encrypts a word. The program should take a single integer ($1 \leq n \leq 1000000$) followed by an uppercase word (length of word: $1 \leq w \leq 8$)

Example

Input: 5 ABCD **Output:** EOYK