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## 9. Rattle

**Program Name:** Rattle.java

**Input File:** rattle.dat

Kim and Pat like to text each other but are afraid that their parents might read their text messages. They have decided to write in code so their parents would not know what they are saying. They have developed a method for encoding their messages. The process for their code is:

- Put the message, including spaces, in the smallest square matrix that will hold the message. Fill cells in each row, beginning with column one, from left to right before moving to the next row. Columns are numbered beginning with column 1 as shown below.
- If there are unused cells at the end of the matrix, the first cell will be filled with an asterisk (\*) and the remaining unused cells will be filled with consecutive letters of the alphabet beginning with the letter A and continuing until all empty cells have been filled.
- "Rattle" the matrix to encode the message as follows:
  - odd numbered columns rotate each letter down one cell with the last cell becoming the first.
  - even numbered columns rotate each letter up one cell with the first cell becoming the last.
- Rewrite the coded message in the new order by rows
- Send the coded message.

For example, the message: I love Computer Science

would fit into the 5x5 matrix at the left below and after the "Rattle" the matrix would look like the matrix on the right below.

1	2	3	4	5
I		L	O	V
E		C	O	M
P	U	T	E	R
	S	C	I	E
N	C	E	*	A

1	2	3	4	5
N		E	O	A
I	U	L	E	V
E	S	C	I	M
P	C	T	*	R
		C	O	E

The encoded message sent would be: N EOAIULEVESCIMPCT\*R COE

You are to write a program that will decode the encoded message.

### Input

The first line of input will contain a single integer  $n$  that indicates the number of encoded messages to be sent. Each of the following  $n$  lines will contain a single encoded message less than 625 characters long.

### Output

For each encoded message, you will print the decoded message. Do not include the characters used to fill the matrix.

### Example Input File

```
2
N EOAIULEVESCIMPCT*R COE
EIG IIKTWINTIIG UHL DISSR CT PSTTWERF RTTTS*EB DOFAHDJSLAIENANC
```

**Note:** There is an intentional space at the end of data case 2

### Example Output to Screen

```
I LOVE COMPUTER SCIENCE
WINNING UIL DISTRICT IS THE FIRST STEP TOWARD STATE
```