

# Caesar Cipher

The Caesar cipher is one of the earliest known and simplest ciphers. It is a type of substitution cipher in which each letter in the plaintext is 'shifted' a certain number of places down the alphabet. For example, with a shift of 1, A would be replaced by B, B would become C, and so on. The method is named after Julius Caesar, who apparently used it to communicate with his generals.

To pass an encrypted message from one person to another, it is first necessary that both parties have the 'key' for the cipher, so that the sender may encrypt it and the receiver may decrypt it. For the caesar cipher, the key is the number of characters to shift the cipher alphabet.

Here is a quick example of the encryption and decryption steps involved with the caesar cipher.

The text we will encrypt is 'DDU CE', with a shift (key) of 1.

plaintext: DDU CE HAP PKP PMJ ciphertext: EEV DF IBQ QLQ QNK

It is easy to see how each character in the plaintext is shifted up the alphabet. Decryption is just as easy, by using an offset of -1.

plain: abcdefghijklmnopqrstuvwxyz cipher: bcdefghijklmnopqrstuvwxyz

Obviously, if a different key is used, the cipher alphabet will be shifted a different amount.

## Input Format

Input will have  $n+2$  lines.

1st line indicates number of test cases.

2nd line indicates key for encryption.

Remaining  $n$  lines will have  $n$  input strings.

## Constraints

$1 \leq n \leq 100$

$1 \leq \text{key} \leq 26$

## Output Format

Output will have  $n$  lines related to  $n$  encrypted texts.

## Sample Input 0

```
4
2
abc
def
xyz
mnopqr
```

Sample Output 0

```
cde
fgh
zab
opqrst
```

Sample Input 1

```
2
1
AaXy
mMoP
```

Sample Output 1

```
BbYz
nNpQ
```

Sample Input 2

```
1
1
aB9
```

Sample Output 2

```
bC0
```

Sample Input 3

```
1
25
abcABC987
```

Sample Output 3

```
zabZAB432
```