Practice Arena

Practice problems aimed to improve your coding skills.

- PRACTICE-02_SCAN-PRINT
- PRACTICE-03_TYPES
- LAB-PRAC-02_SCAN-PRINT
- LAB-PRAC-01
- PRACTICE-04_COND
- BONUS-PRAC-02
- LAB-PRAC-03_TYPES
- PRACTICE-05_COND-LOOPS
- LAB-PRAC-04_COND
- LAB-PRAC-05_CONDLOOPS
- PRACTICE-07_LOOPS-ARR
- LAB-PRAC-06_LOOPS
- LAB-PRAC-07_LOOPS-ARR
- LABEXAM-PRAC-01_MIDSEM
- PRACTICE-09_PTR-MAT
- LAB-PRAC-08_ARR-STR
- PRACTICE-10_MAT-FUN
- LAB-PRAC-09_PTR-MAT
- LAB-PRAC-10_MAT-FUN
- PRACTICE-11_FUN-PTR
- LAB-PRAC-11_FUN-PTR
- LAB-PRAC-12_FUN-STRUC
  - Point Pairing Party
  - Verify the family tree of Mr C
  - Simple Sodoku
  - The Family Tree of Mr C Part Three
  - The Post offices of KRville
  - Matrix Mandala
  - Mango Mania
  - Recover the Rectangle
  - Crazy for Candy
  - A Brutal Cipher Called Brutus
  - Triangle Tangle
  - Basic Balanced Bracketing
- LABEXAM-PRAC-02_ENDSEM
- LAB-PRAC-13_STRUC-NUM
- LAB-PRAC-14_SORT-MISC

A Brutal Cipher Called Brutus

LAB-PRAC-12_FUN-STRUC

A Brutal Cipher Called Brutus [20 marks]

Problem Statement
Mr C needs to convey a secret message to one of his clones without the other clones being able to overhear and know the secret. The two agree on two single digits (i.e. 0-9). These will be given to you in the first line of the input as a non-negative two digit number. Let the first digit in the number be called P and the second digit be called Q. For example, let P = 2 and Q = 3 (i.e. the number given to you is 23).

The first thing Mr C does is he rotates the letters at odd locations in the alphabet (e.g. A, C, E, G etc) right by P locations among themselves. In this example, since P = 2, A will shift to E's position in the alphabet, C will shift to G's position in the alphabet and so on. The process wraps around i.e. W shifts to A's position and Y shifts to C's position.

Next, Mr C rotates the letters at even locations in the alphabet (e.g. B, D, F, H, J etc) right by Q locations among themselves. In this example, since Q = 3, B will shift to H's position in the alphabet, D will shift to J's position in the alphabet and so on. The process wraps around i.e. Z shifts to F's position.

The original alphabet is
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
After doing these two rotations, the alphabet looks like
W V Y X A Z C B E D G F I H K J M L O N Q P S R U T

After this, the final step is to reverse the alphabet to get
T U R S P Q N O L M J K H I F G D E B C Z A X Y V W

Thus, A maps to T, B maps to U and so on. In the second line of the input, we will give you a message containing only uppercase English characters or spaces. You have to tell us what is the encrypted message (spaces remain spaces in the encrypted message).

In the first line of the output, print the alphabet as obtained after the two rotation steps (print the 26 characters in a single line - no spaces between two characters, no spaces at the end). In the second line of the output, print the alphabet after further performing the reversal step. In the third line of the output, print the encrypted string.

Caution

1. The original message will contain no more than 99 characters and will be presented to you in a single line.
2. Be careful, one or both the digits in the key can be zero, i.e. the first line can give you a number like 01 or even 00.
3. Be careful about extra/missing lines and extra/missing spaces in your output.

EXAMPLE:
INPUT

23
HOW DO YOU DO

OUTPUT:
WVYXAZCBEDGFIHKJMLONQPSRUT
TURSPQNOLMJKHIFGDEBCZAXYVW
OFX SF VFZ SF

Grading Scheme:
Total marks: **[20 Points]**

There will be partial grading in this question. There are three lines in your output. Printing each line correctly, in the correct order, carries 33% weightage. Each visible test case is worth 2 points and each hidden test case is worth 4 points. There are 2 visible and 4 hidden test cases.

Please remember, however, that when you press Submit/Evaluate, you will get a green bar only if all parts of your answer are correct. Thus, if your answer is only partly correct, Prutor will say that you have not passed that test case completely, but when we do autograding afterwards, you will get partial marks.

Start Solving! (/editor/practice/6239)