Contest Ciphers

Cryptography is an exciting discipline, don't you think? Since ancient times, people always felt the need to protect the content of their sensitive messages. Thank to cryptography, a message content (so-called *plaintext*) can be encrypted (*enciphered*) into its encoded form (*ciphertext*) that may be then transferred across insecure channels because it is unreadable for anyone except the intended recipient, who will decrypt (*decipher*) the message into the plaintext again. Good algorithms are parametrized by *keys* — even if we know the algorithm, it is still impossible to read the message without the proper key.

Yesterday, some of you have tried a couple of non-traditional ways to hide the meaning of a text during our *CERC Cipher Contest*. Today, instead of the Cipher Contest, we have prepared a set of *Contest Ciphers* and other cryptography-related problems you are to solve algorithmically.

Your programs can be written in C, C++, or Java programming languages. The choice is yours but you will be fully responsible for the correctness and efficiency of your solutions. We need the correct answer produced in some appropriate time. Nothing else matters. You may choose any algorithm and any programming style.

All programs will read one single text file from the standard input. The results will be written to the standard output. Input and output formats are described in problem statements and must be strictly followed. Each text line (including the last one) should be always terminated by a newline character ("`\n`"), which is not considered a part of that line.

You are not allowed to use any other files, communicate over network, create threads or processes, or do anything else that could jeopardize the competition.

Happy enciphering and deciphering!

This problem set consists of 11 sheets of paper (including this one) and it contains 10 problems. Please make sure you have the complete set.