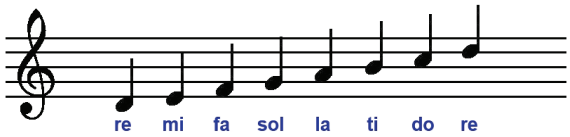
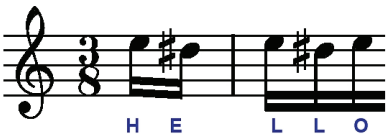
Task 3. «The musical notation»

Alice and Bob invented a new way for encrypting messages based on musical notations of melodies. They are not very good in musical notations but they know the basic notes «do», «re», «mi», «fa», «sol», «la», «ti», and their places in the staff:



To encrypt a message of length n in English alphabet Alice chooses a melody consisting of n notes. She writes a message under the musical notation of the melody in such a way that each letter of the message corresponds to exactly one note's position in the musical notation. Then for each note («do», «re», ..., «ti») Alice forms the ordered group of corresponding letters. Further she takes a random integer number k_i, $i = 1, \ldots, 7$, and cyclically shifts letters in the i-th group on k_i positions to the right. After that Alice forms the ciphertext by writing letters of the shifted groups under the musical notation again.

An example. Suppose that Alice wants to send the message `H E L L O`.



The group for «re» is (`E`, `L`); for «mi» — (`H`, `L`, `O`). Alice takes random numbers 2 and 1 for «re» and «mi» respectively. After shifting she gets groups (`E`, `L`) and (`O`, `H`, `L`). Hence the ciphertext for the message is `O E H L L`.

Decrypt the following ciphertext sent to Bob by Alice:

`R O L E L I S E O E E E H T O M V C P B D E F S O N`

It is known that Alice used the musical notation below.