Summary

Your goal is to write a program that performs a simple encoding of a large volume of text. You can write your application in any language you choose (just try to make it easy for the reviewer to compile/execute your code).

Details

Part of your application is a set of three-character transform functions. These transforms apply to a 4-row × 1-column section of keys on a standard QWERTY keyboard. The four rows start with '1', 'q', 'a' and 'z', and extend to '0', 'p', ';' and '/' respectively.

There are three types of transforms that can be specified, in combination.

Horizontal Flip

This transformation will flip all rows of the keyboard horizontally (e.g. the '1' will swap with the '0', the '2' with the '9', etc.).

Vertical Flip

This transformation will flip all columns of the keyboard vertically (e.g. the '1' will swap with the 'z', the 'q' with the 'a', the '2' with the 'x', etc.).

Shift

This transformation should take in an integer *N* and perform a linear shift of the keyboard. Each key should shift *N* places to its right if $N > 0$ (and likewise to the left if $N < 0$). If a key would move past its current row then it should shift into the row below, and so on. For example, for $N = 5$, the last keys (nm,./) would into the first five places of the top row, the 12345 would move five places to the right, 67890 would move to the start of the second row and so on. Likewise, left-shifting keys past their current rows would shift them back into the row above; therefore, a single right and left shift would product the same keyboard result.

Inputs

Your program will be called with two files: a transformation file, and a file on which to apply the transformation (i.e. a large text file).

Transformation File

One text file will specify the transformation to be applied on the text file, using the following encoding:

- Horizontal Flip – represented by the character 'H'.
- Vertical Flip – represented by the character 'V'.
- Shift – represented by an integer.

For example, the following instructions:

- horizontal flip (H)
- vertical flip (V)
- shift by 5 (5)
- vertical flip (V)
- shift by -12 (-12)

Would be encoded as "H,V,5,V,-12".

Output

The program should print out the transformed text.

Additional Points

- Ensure your program can handle large input files.
- Your program should be able to transform a huge volume of text efficiently.
- Any unrecognized characters from the input should go into the output unchanged.
- Consider ways in which to demonstrate to the reviewer the correctness of your code, such as providing unit tests.

Deliverables

- Source code
- Executable
- Short "readme" on how to run the program