**8.2 Assignment 2, due Thursday 2018-02-15, at 11:00pm**

For this assignment, you are to implement a simple transposition cipher.

This cipher encrypts and decrypts a sequence of characters by dividing the sequence into blocks of size *n*, where *n* is specified by the encryption key. If the input text has a length that is not a multiple of *n*, the last block is padded with null characters ('\0').

In addition to *n*, the key also specifies two parameters *a* and *b*. For each block, the *i*-th output character, starting from 0 as usual, is set to the *j*-th input character, where *j* = (*ai* + *b*) mod *n*. For appropriate choices of *a* and *b*, this will reorder the characters in the block in a way that can be reversed by choosing a corresponding decryption key (*n*, *a*′,*b*′).

For example, if *n* = 5, *a* = 3, and *b* = 2, the string Hello, world! would be encrypted like this:

in: H e l l o , w o r l d ! \0 \0

i: 0 1 2 3 4 0 1 2 3 4 0 1 2 3 4

j: 2 0 3 1 4 2 0 3 1 4 2 0 3 1 4

out: l H l e o w , o r ! l \0 d \0

8.2.1 Your task

Write a program transpose.c that takes *n*, *a*, and *b* in argv[1], argv[2], and argv[3], respectively, and an input string from stdin; applies the above encryption; and writes the result to stdout.

You may assume that *n*, *a*, and *b* are all small enough to fit into variables of type int. Your program should exit with a nonzero exit code if *n* is not at least 1 or if it is not given exactly three arguments, but you do not need to do anything to test for badly-formatted arguments. You should not make any other assumptions about the values of *n*, *a*, or *b*; for example, either of *a* or *b* could be zero or negative.