CSCD 255
Lab 8

I have provided a main that allows the user to encrypt or decrypt a string. A menu is repetitively displayed that allows the user to: change the string, encrypt a string, decrypt an encrypted string, or quit. To encrypt a string you will shift any alphabetical character a specified number of spaces to the left or right as though the alphabet were circular (this is shown below and will be further explained in class). All other characters should be written 'as is.'

```
NORMAL ALPHABET:   A   B   C   D   E   F   G   H
SHIFT RIGHT BY 2:  Y   Z   A   B   C   D   E   F
SHIFT LEFT BY 3:   D   E   F   G   H   I   J   K
```

When the program starts, the user is prompted for the original string. (You are guaranteed the string will be lowercase. The string may contain punctuation and/or numbers) You must guarantee that string is not null or empty. The user is then prompted for the amount to shift, and the direction to shift. You must ensure the number is within the range of 0 to 2 billion. The direction must be a string and be either 'L' or 'R' – you must ensure the letter is 'r' or 'l' and it will be written as a capital letter.

ENCRYPTING

Once you have the original string, the amount to shift and the direction, you will encrypt the string by shifting the appropriate direction, the appropriate amount. The encrypted string will contain the amount of the shift, the direction of the shift, and the encrypted string. That encrypted string will be displayed to the screen.

For example, the original string is stu. The user wants to shift right by one. The encrypted string would then be: 1Rtuv

What is displayed to the screen is → Your encrypted string is 1Rtuv

DECRYPTING

To decrypt a string, you must first pull the shift number from the string. You then have to pull the direction that original string was shifted. Note: the original string was shifted right, to create the encrypted string. When you decrypt you will need to shift the string left. You then use the direction and shift amount to decrypt.

The decrypted string will appear the same as the original string.

For the example using the encrypted string 1Rtuv from above, what is displayed to the screen is → Your decrypted string is stu

NOTES

- All output will be written to the screen.
- Your menu will appear as the following (You must verify the menu choice is within range)
    1. Read a New String
    2. Encrypt
    3. Decrypt
    4. Quit
- You can't change my main.c file.

TO TURN IN:

A zip file containing

- All C code
- At least 3 encrypts and 3 decrypts – named cscd255lab8out.txt
- A valgrind run showing you are leak free – named cscd255lab8val.txt

Name the zip file your last name first letter of your first name lab8.zip (Example: steinerslab8.zip)