Program Purpose: This program accepts a text file and either outputs an encrypted version or decrypts the text file based on the cryptographic algorithm in the program. It then returns either an unencrypted text file or an encrypted text file.

Program Flow: The program runs on one main while loop. The program will always display the main menu:

1 Encrypt a file

2 Decrypt a file

3 End program

The program will only exit if 3 is pressed and if there is an error during 1 Encrypt a file, or 2 Decrypt a file. If 1, 2, or 3 is not chosen, the program will say to pick 1, 2, or 3 and give the menu again.

Encrypting Path: If the user chooses to input 1, the program will ask the user to input a text file. The program will also ask the user to name the output file. If the text file is invalid or not a text file, an error will occur. Otherwise, the program reads the user's text file line by line and encrypts it with the function Encrypt. The Encrypt function then returns an encrypted file for the user, and the program goes back to the main menu.

Decrypting Path: If the user chooses to input 2, the program will ask the user to input an encrypted text file. The program will also ask the user to name the output file. If the text file is invalid or not a text file, an error will occur. Otherwise, the program reads the user's text file line

by line and decrypts it with the function Decrypt. The Decrypt function then returns a Decrypted file for the user, and the program goes back to the main menu.

ENCRYPT ALGORITHM: The encryption algorithm uses transposition, shifting, and substitution in that order to encrypt the file.

Transposition- Go through the line in blocks of 4. Move each chunk around so index 0=2 and index 2=0, and index 1=4 and index 4=1.

Shifting- For each position at its index, change the position in the line using (5*i +2). This is only for letters.

Substitution- Each letter is replaced with my own mixed alphabet letter.

DECRYPT ALGORITHM: The decryption algorithm undoes the encryption algorithm by going backwards, undoing substitution, shifting, and transposition in that order.

Substitution- Go through each letter in the encrypted line and see where it was located in my mixed alphabet and substitute the original letter.

Shifting- Instead of adding the (5*i +2) shift, subtract it and return the original character to that position.

Transposition- Simply rerun the 4 blocks of characters shifted code and return the character back to its original place.