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* I chose the Vigenère cipher for my project. The main goal of this project is to encrypt and decrypt a message using a keyword. However I did stumble upon a few obstacles like implementing spaces and getting the key to repeat throughout the entire length of the input message.
* To resolve these, for the spaces I inserted an if statement inside the for loop that for the encryption that adds a space if the current character is a space using the push\_back function. For the key I created a function called makekey that matches the length of the inputted message.
* To encrypt the calculation used is (int x = (text[i] + modifiedKey[i]) % 26) where it takes the current value of text plus the current value of the modifiedkey and divides it by 26. Then the x+= ‘A’ add the value of x to the capital value ‘A’ and you get the new character value. This repeats inside the for loop of the function. And a very similar process for decryption except it subtracts the modified key from the encrypted text and add 26 before dividing. So it look like this. int x = (encryptedText[i] - modifiedKey[i] + 26) % 26;
* The objective of this program is to be able to encrypt and decrypt a message that is inputted by the user. When first starting up the program, you will see a welcome message. It will ask you to choose one of the three options. 1. Encrypt, 2. Decrypt, 3. Exit. If you choose either encrypt of decrypt it will ask you to enter a message first and the keyword, then it will encrypt or decrypt. It will then ask you to choose another option at which point you can choose again or exit.
* Discrete structure are implemented inside the for loops of the encrypt and decrypt functions where the calculation takes place. int x = (text[i] + modifiedKey[i]) % 26 and int x = (encryptedText[i] - modifiedKey[i] + 26) % 26;
* This program does have a bit of limitations: one of the biggest being its inability to encrypt or decrypt lower case letters or symbols accurately.
* This can be improves I would either have to add a function to allow lowercase letters to be implemented or rewrite the encryption and decryption functions to do so making several conditions

Pseudocode

Header iostream

Header string

Using namespace std;

Function to make key same length of the text called makeKey with const srting& text, const string & key

Assign the value of key to modified key

While loop that makes the value of key repeat while the size of the text Is greater

Function for encryption with same constants

Define string encryptedText and initialize it as an empty space

Call makeKey function and assign the value to modifiedKey

Create for loop that iterates over each character

Uses if statement inside to determine if there are any spaces

Uses formula (text[i] + modifiedkey[i]) %26 to determine new value

Returns encrypted text

Function for decryption

Define string originalText and initialize it as an empty space

Call makeKey function and assign the value to modifiedKey

Create for loop that iterates over each character

Uses if statement inside to determine if there are any spaces

Uses formula ((text[i] + modifiedkey[i]) +26)%26 to determine new value

Returns originaltext

Main function

Declare text, keyword, choice

Declare and initialized encrypted text to blank

Display welcome messages and options

Do while loop containing the various if statement