```
#include <iostream>
#include <string>

using namespace std;

string Generate_The_Key(const string& text, const string& Key) // The creation of the key
{
	string Key_TotRep = Key;

	while (Key_TotRep.length() < text.length())
	{
	Key_TotRep += Key; // The repetition of the key word
	}

	return Key_TotRep.substr(0, text.length()); // Adjusting the length of the characters to be
repeated
}


string Encrypt_The_Text(const string& plaintext, const string& key) // This part allow the
program to encrypy text following the vigenere cypher guidelines
{
	string Text_Encrypted = "";

	for (size_t i = 0; i < plaintext.length(); i++) // The Formula: E(i) = (P(i) + K(i)) mod 26
	{
	char Char_Encrypted = ((toupper(plaintext[i]) - 'A') + (toupper(key[i]) - 'A')) % 26 + 'A';

	Text_Encrypted += Char_Encrypted;
	}

	return Text_Encrypted; // The result and the displayed infotmation  will be the encrypted
text
}

string Decrypt_The_Text(const string & ciphertext, const string& key)

// This part allow the program to decrypt or reveal text following the vigenere cypher guidelines

{
	string Text_Decrypted = "";

	for (size_t i = 0; i < ciphertext.length(); i++) // The Formula : D(i) = (C(i) - K(i) + 26) mod
26
```

```
        {
        char Char_Decrypted = ((toupper(ciphertext[i]) - 'A') - (toupper(key[i]) - 'A') + 26) % 26 +
'A';

        Text_Decrypted += Char_Decrypted;


        }

        return Text_Decrypted; // The result and the displayed infotmation  will be the decrypted
or original text

}

int main()
{
        int Choice;

        string User_Text, The_Key;

        // The introduction for the user
        // The main menu
        // This part here is a welcome text for the user. This is where the program will ask what
you want to do and you will have to make a decision
        // Options include encrypting, decrypting or just exiting the program

        cout << "-----------------------------------------------------------------------------------------------\n";
        cout << "  THE VIGENERE CYPHER BY MAURO ELIAS \n";
        cout << "-----------------------------------------------------------------------------------------------\n";

        cout << "  Hello Everyone !!! Welcome to my final project for CIS-7, 'THE VIGENERE
CYPHER'\n";

        cout << "  How is everything going today ??? Please tell me what would you like to do\n";


        cout << "1. I want to ENCRYPT a message \n";
        cout << "2. I want to DECRYPT a message \n";
        cout << "3. I want to EXIT\n";


        cout << "Please Choose and option (1-3): ";

        cin >> Choice;
```

```
        if (Choice == 1) // ENCRYPT THE MESSAGE
        {
        // In this part we will work with option 1
        // The text, word or phrase together with the key of your choice will be entered here and
processed
        // to return your code already encrypted in vigenere

        cout << "\n Please type the text you want me to encrypt (type it all together): ";
        cin >> User_Text;

        // HEre the user will be required to give a text

        cout << "Please type a password/key (type it all together): ";
        cin >> The_Key;

        //Here the user will be required to provide a key

        // KEY CREATION AND ENCRYPTION

        string Tot_Key = Generate_The_Key(User_Text, The_Key);

        string Res_Encrypted_Text = Encrypt_The_Text(User_Text, Tot_Key);

        // The result will be displayed

        cout << "Your cipher text: " << Res_Encrypted_Text << "\n";

        // This will be the end of the 1st option
        }

        else if (Choice == 2) // DECRYPT THE TEXT
        {
        cout << "\n Please type in the text you want me to decrypt (type it all together): ";
        cin >> User_Text;

        // Here the user will be required to give a text (Encrypted Test)


        cout << "Please type a password/key (type it all together): ";
        cin >> The_Key;

        //Here the user will be required to provide a key
```

```
        // KEY CREATION AND DECRYPTION

        string Total_Key = Generate_The_Key(User_Text, The_Key);

        string Res_Decrypted_Key = Decrypt_The_Text(User_Text, Total_Key);

        // Decrypt the text will be called

        cout << "Your decrypted text: " << Res_Decrypted_Key << "\n";

        // The result will be displayed

        // This will be the end of option 2

        }

        else if (Choice == 3) // EXIT
        {
        cout << "Bye, have a great day!\n";
        }

        // The program will end with the a kind message

        //INVALID OPTION:
        else
        {

        cout << "Sorry, your option is not valid. \n";

        // If the user does not provide accurate responses (Special Characters or Letters)

        cout << "Please restart the program and choose a number from 1 to 3.\n";
        }

        return 0;
}
```