In the documentation, provide at least 2 pages (single-space) that contains the following components of your course project:

1. Team name is Only1 and the members are Ivan Herrera
2. Project Information and details: (30 points)

* What problems are you solving in this project? The problems that I am trying to solve are to crate a program that runs and works well for example I have to be able to use code that will take the users input and have the correct output.
* Provide explanation of calculations and algorithm implementation.
* What are the program objectives? Explain how your program is interacting with the user and its purpose. The program will ask the user to input a message then it will ask the user to input a shift value then it will ask the user to select one of two options and then the program will display the output depending on what the user selected.
* How are discrete structures implemented in the C++ program? Discrete structures are used by using cryptography and Caesar cipher to create the program for encrypting and decrypting. I used for loops and if and if else statements for the encryption and decryption.
* What are the limitations of the program? Unfortunately, I was not able to create the program I wanted. I tried to make the vigenere cipher but ultimately, I could not figure out how to implement it in code. I was only able to create a general Caesar cipher program that encrypts or decrypts messages.
* Provide recommendation on improving the limitations of the program. One way to improve the program would be to create a formula that allows the user to input letters and then a cipher key and then the program would use the cipher key to give the correct output to the user.

Program explains how it works

“Type in a message”

User inputs their message

Program asks user to select a shift value.

User inputs their shift value

Program asks user to select encrypt or decrypt option.

Encrypted message appears

User inputs encryption

Decrypted message appears

User inputs decryption

**Program purpose:**

The purpose/objective of the program is to allow the user to input a message that they’re trying to encrypt or decrypt. Once they enter a message, they get to choose the shift value that the program will use for the message.

**Pseudocode:**

* Display beginning message to inform user of what the program itself does.
* Tell user to input their desired message of choice.
* User inputs their message.
* Tell user to select a shift value of their choice.
* User inputs their shift value.
* Have user select one of two options, encrypt or decrypt.
* User selects option.
* Display result.

**Code:**

//Program: Vigenere Cipher Program

//Group: Only1

//Name: Ivan Herrera

#include <iostream>

using namespace std;

int main()

{

int i, input, key;

char string[100], ch;

// Explains to user what the program does

cout << endl << "This program allows you to input a message, choose a shift value,"

<< endl << "and allows you to choose whether you want to encrypt or decrypt the message."

<< endl << endl;

cout << "Type in a message (no spaces): " << endl << endl;

cin >> string;

cout << "Now enter shift value: " << endl; //User can input thier shift value

cin >> key;

//User can select one of the two options down below

cout << endl << "Now choose one of the two options down below:" << endl;

cout << "1. This option allows you to encrypt your message." << endl;

cout << "2. This option allows you to decrypt your message." << endl;

cin >> input;

switch(input)

{// This is for the ecryption option

case 1:

for(i = 0; i < 100 && string[i] != '\0'; ++i)

{

ch = string[i];

if(ch >= 'a' && ch <= 'z')

{

ch = ch + key;

if(ch > 'z')

{

ch = ch - 'z' + 'a' - 1;

}

string[i] = ch;

}

else if(ch >= 'A' && ch <= 'Z')

{

ch = ch + key;

if(ch > 'Z')

{

ch = ch - 'Z' + 'A' - 1;

}

string[i] = ch;

}

cout << endl << "Encrypted message: " << string << endl;

break;

//This is for the decryption option

case 2:

for(i = 0; string[i] != '\0'; ++i)

{

ch = string[i];

if(ch >= 'a' && ch <= 'z')

{

ch = ch - key;

if(ch < 'a')

{

ch = ch + 'z' - 'a' + 1;

}

string[i] = ch;

}

else if(ch >= 'A' && ch <= 'Z')

{

ch = ch - key;

if(ch > 'a')

{

ch = ch + 'Z' - 'A' + 1;

}

string[i] = ch;

}

}

cout << endl << "Decrypted message: " << string << endl;

break;

//This appears to user if they input an invalid message

default:

cout << endl << "The input you entered is not valid. "

"Please re-run the program and try again." << endl;

}

}

return 0;

}