#include <iostream>

#include <string>

using namespace std;

class VClass

{

public:

string key;

char vArray [26][26];

VClass(string cipherText)

{

key= cipherText;

}

//function to create 2-dimensional matrix by rows

void createMatrix(){

int rows=0;

int columns=0;

for(rows=0;rows<26;rows++)

{

for(columns=0;columns<26;columns++)

{

if (rows+columns+65>90)

{

vArray[rows][columns]=static\_cast<char>((rows+columns+65-26));

}else{

vArray[rows][columns]=static\_cast<char>((rows+columns+65));

}

}

}

}

//function to encrypt a message

string encipher(string text)

{

string out;//output string

for(int i = 0, j = 0; i < text.length(); ++i)

{

char c = text[i];

if(c==' ')

{

out=out+" ";

}

else

{

out=out+vArray[(int)c-65][(int)(key[j])-65];

j = (j + 1) % key.length();

}

}

return out;

}

//function to decrypt the message

string decipher(string text)

{

string out;

for(int i = 0, j = 0; i < text.length(); ++i)

{

char c = text[i];

if(c==' ')

{

out=out+" ";

}

else{

for (int k=0;k<26;k++)

{

if (vArray[(int)(key[j])-65][k]==c)

{

char alpha=k+65;//coverting number to character

out=out+ alpha;

}

}

j = (j + 1) % key.length();

}

}

return out;

}

};

int main()

{

string cipherText="";

cout<<"Please enter cipher key in capital letters\n";

cin>>cipherText;

//creating 2-dimensional matrix

VClass myObject(cipherText);

myObject.createMatrix();

//Original Text is mentioned here; Make sure to enter only capital letters

string originalText = "ARJUN";

string encryptedText = myObject.encipher(originalText);

string decryptedText = myObject.decipher(encryptedText);

cout << "Your Original Text is: "<<originalText << endl;

cout << "Your Enciphered Text is: " << encryptedText << endl;

cout << "Your Deciphered Text is: " << decryptedText << endl;

}