Q: WAP to implement the substitution cipher.

Ans:

Source Code:

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

using namespace std;

// function to decrypt cipher
string decrypt(string code, unsigned int key){
    for(int c=0;c<code.size();c++){ // itereting every element in cypher
        // ignore characters other then alphabets
        if(!((code[c]>='a' && code[c]<='z') || (code[c]>='A' && code[c]<='Z'))) contin
ue;

        int firstChar= islower(code[c]) ? 'a' : 'A', //checking if the char in capital or not
            relativeVal=code[c]-firstChar, // shifting the values of character between 0-
25
            newVal=relativeVal-key; // shifting values accotding to key
        if(newVal<0){ // changing values if they are negative
            newVal+=26;
        }
```

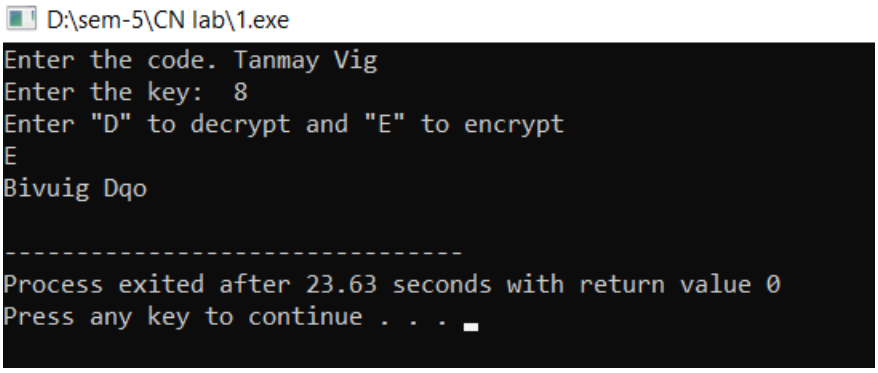
```
        code[c]=firstChar + newVal; // changing realative values to original values and
 storing them

    }

    return code;

}


// function to encrypt the cipher

string encrypt(string code, unsigned int key){

    for(int c=0;c<code.size();c++){ // iterating every element in cypher

        //ignore characters other then alphabets

        if(!((code[c]>='a' && code[c]<='z') || (code[c]>='A' && code[c]<='Z'))) contin
ue;



        int firstChar=islower(code[c]) ? 'a':'A', //checking if the char in capital or not

            relativeVal=code[c]-firstChar,// shifting the values of character between 0-
25

            newVal=(relativeVal+key)%26;// shifting values according to key and ment
aining them in range 0-25



        code[c] = firstChar + newVal;// changing realative values to original values an
d storing them

    }

    return code;

}
```

```
int main(){
    unsigned int key;
    string code,descision;

    // taking input for code
    cout<<"Enter the code.\t";
    getline(cin,code);

    //taking input for key
    cout<<"Enter the key:\t";
    cin>>key;

    // giving user choice to Decrypt or Encrypt
    cout<<"Enter \"D\" to decrypt and \"E\" to encrypt\n";
    cin>>descision;

    key%=26; // k must be in range 0-25

    if(descision=="D"){ // decrypting code
        cout<<decrypt(code,key)<<endl;
    }else{ // encrypting code
```

```
        cout<<encrypt(code,key)<<endl;
    }
    return 0;
}
```

Output:

Encryption:



Decryption: