

Information Security

Name: Kanish

College Roll No: CSC/21/53

University Roll No: 21059570017

5. Implement playfair cipher substitution operation.

```
#include<iostream>
#include<string>
#include<vector>
#include<map>
using namespace std;
int main(){
    int i,j,k,n;
    cout<<"Enter the message"<<endl;
    string s,origin;
    getline(cin,origin);
    cout<<"Enter the key"<<endl;
    string key;
    cin>>key;
    for(i=0;i<origin.size();i++){
        if(origin[i]!=' ')
            s+= origin[i];
    }
    vector<vector<char> > a(5,vector<char>(5,' '));
    n=5;
    map<char,int> mp;
    k=0;
    int pi,pj;
    for(i=0;i<n;i++){
        for(j=0;j<n;j++){
            while(mp[key[k]]>0&&k<key.size()){
                k++;
            }
            if(k<key.size()){
                a[i][j]=key[k];
                mp[key[k]]++;
                pi=i;
                pj=j;
            }
        }
    }
}
```

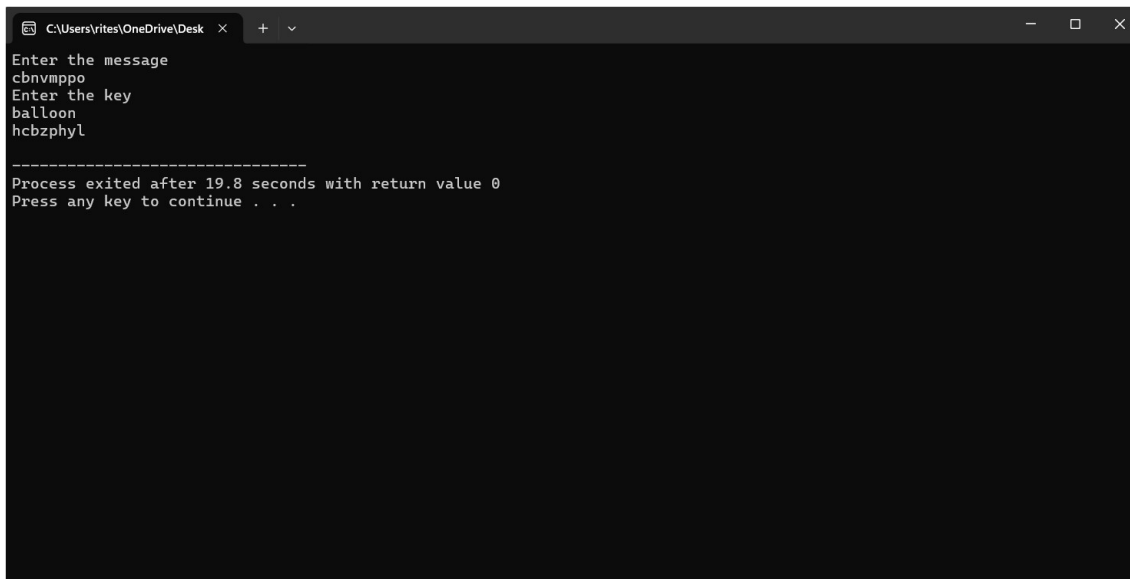
```

        }
        if(k==key.size())
            break;
    }
    if(k==key.size())
        break;
}
k=0;
for(;i<n;i++){
    for(;j<n;j++){
        while(mp[char(k+'a')]>0&&k<26){
            k++;
        }
        if(char(k+'a')== 'j'){
            j--;
            k++;
            continue;
        }
        if(k<26){
            a[i][j]=char(k+'a');
            mp[char(k+'a')]++;
        }
    }
    j=0;
}
string ans;
if(s.size()%2==1)
    s+="x";
for(i=0;i<s.size()-1;i++){
    if(s[i]==s[i+1])
        s[i+1]='x';
}
map<char,pair<int,int> > mp2;
for(i=0;i<n;i++){
    for(j=0;j<n;j++){
        mp2[a[i][j]] = make_pair(i,j);
    }
}

for(i=0;i<s.size()-1;i+=2){
    int y1 = mp2[s[i]].first;
    int x1 = mp2[s[i]].second;
    int y2 = mp2[s[i+1]].first;
    int x2 = mp2[s[i+1]].second;
    if(y1==y2){
        ans+=a[y1][(x1+1)%5];
        ans+=a[y1][(x2+1)%5];
    }
}

```

```
        else if(x1==x2){
            ans+=a[(y1+1)%5][x1];
            ans+=a[(y2+1)%5][x2];
        }
        else {
            ans+=a[y1][x2];
            ans+=a[y2][x1];
        }
    }
    cout<<ans<<'\n';
    return 0;
}
```



```
C:\Users\rites\OneDrive\Desktop >
Enter the message
cbnvmppo
Enter the key
balloon
hcbzphyl

-----
Process exited after 19.8 seconds with return value 0
Press any key to continue . . .
```