2) To write a python program to implement the Playfair Substitution technique.

PROGRAM:-

```
MX=5
def pf(a,b,k):
 w=x=y=z=-1
 for i in range(MX):
  for j in range(MX):
   if a==k[i][j]:w,x=i,j
   if b==k[i][j]:y,z=i,j
 if w==y and x!=-1 and z!=-1:return f"{k[w][(x+1)%5]}{k[y][(z+1)%5]}"
 elif x==z and w!=-1 and y!=-1:return f"{k[(w+1)%5][x]}{k[(y+1)%5][z]}"
 elif w!=-1 and x!=-1 and y!=-1 and z!=-1:return f"{k[w][z]}{k[y][x]}"
 return""
k=[[0]*MX for _ in range(MX)]
s=input("Enter key: ").upper().replace('J','I')
s=''.join(dict.fromkeys(s))
t=input("Enter text: ").upper().replace('J','I')
t=''.join(filter(str.isalpha,t))
r=[c for c in'ABCDEFGHIKLMNOPQRSTUVWXYZ'if c not in s]
a=s+''.join(r)
for i in range(MX):
 for j in range(MX):k[i][j]=a[i*MX+j]
p=[]
i=0
while i<len(t):
 if i==len(t)-1:p.append((t[i],'X'));i+=1
 else:
  if t[i]==t[i+1]:p.append((t[i],'X'));i+=1
  else:p.append((t[i],t[i+1]));i+=2
c=''.join([pf(a,b,k)for a,b in p])
print(f"Text: {t}\nCipher: {c}")
```

OUTPUT:-

```
 Enter Key: hello
 Enter Text: cse
H E L O A
B C D F G
I K M N P
Q R S T U
V W X Y Z
Text: CSE
Cipher: DRLW
```