## **Ques 5.** Implement play fair cipher substitution operation.

Ans:-

```
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import string
import numpy as np
key=input("Enter key :- ")
key=key.lower()
key=key.replace(" ","")

temp=[]
for alpha in key:
    if alpha not in temp:
        temp.append(alpha)
key=temp
matrix=[]
for i in string.ascii_lowercase[:26]:
    if i not in key:
        key.append(i)
i=key.index('i')
j=key.index('j')
if i<j:
    del key[j]
else:
    del key[i]
temp1=key
while key!=[]:
    matrix.append(key[:5])
    key=key[5:]

print("Playfair Cipher Matrix is :- ",matrix)
def getpoistion(alpha,matrix):
    for i in range(len(matrix)):
        for j in range(len(matrix[i])):
            if matrix[i][j] == alpha:
                return (i, j)



text=input("Enter Text to Encrypt  :- ")
```
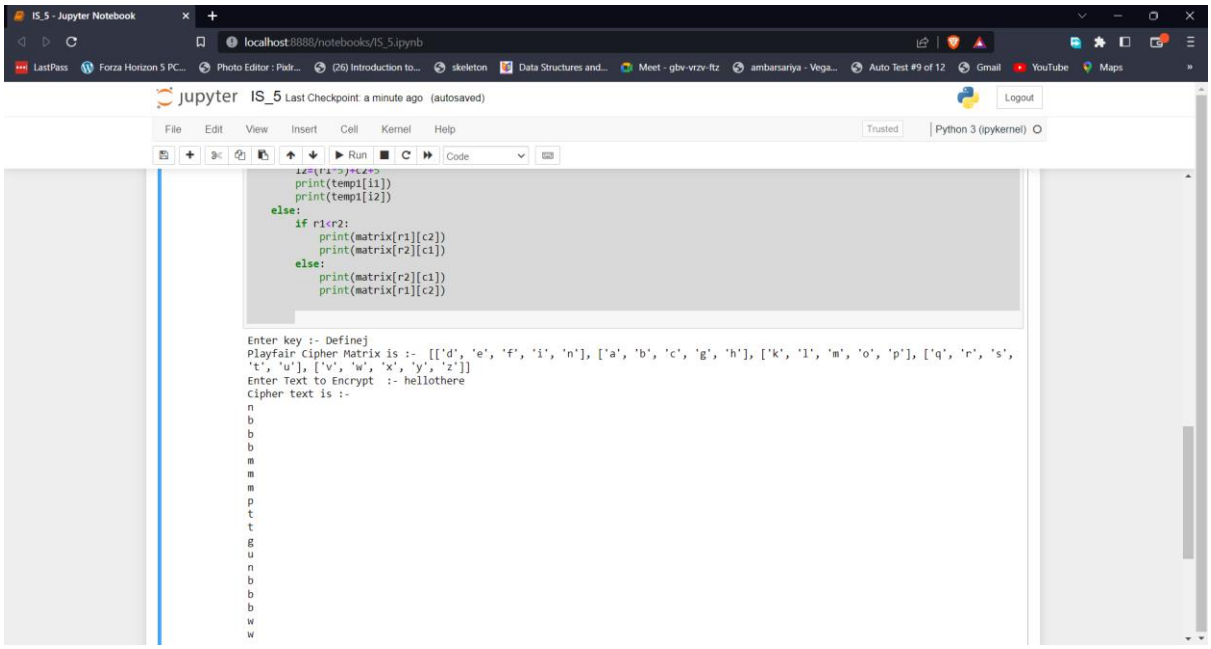

```
text=text.lower()
text=text.replace(" ","")
text1=[]
for i in text:
    if i not in temp1:
        if i=='j':
            text1.append('i')
        else:
            text1.append('j')
    else:
        text1.append(i)

text=text1
print("Cipher text is :- ")
for i in range(len(text)):
    r1,c1=getpoistion(text[i],matrix)
    r2,c2=getpoistion(text[i+1],matrix)
    i=i+1
    if r1==r2:
        i1=(r1*5)+c1+1
        i2=(r1*5)+c2+1
        i1=i1%25
        i2=i2%25
        print(temp1[i1])
        print(temp1[i2])
    elif c1==c2:
        i1=(r1*5)+c1+5
        i2=(r1*5)+c2+5
        print(temp1[i1])
        print(temp1[i2])
    else:
        if r1<r2:
            print(matrix[r1][c2])
            print(matrix[r2][c1])
        else:
            print(matrix[r2][c1])
            print(matrix[r1][c2])
```

OUTPUT:-


IS_5 - Jupyter Notebook
localhost:8888/notebooks/IS_5.ipynb
jupyter IS_5 Last Checkpoint: a minute ago (autosaved)
Logout
File Edit View Insert Cell Kernel Help
Trusted
Python 3 (ipykernel)
Run
Code
print(temp1[11])
print(temp1[12])
else:
if r1<r2:
print(matrix[r1][c2])
print(matrix[r2][c1])
else:
print(matrix[r2][c1])
print(matrix[r1][c2])
Enter key :- Definej
Playfair Cipher Matrix is :- [['d', 'e', 'f', 'i', 'n'], ['a', 'b', 'c', 'g', 'h'], ['k', 'l', 'm', 'o', 'p'], ['q', 'r', 's', 't', 'u'], ['v', 'w', 'x', 'y', 'z']]
Enter Text to Encrypt :- hellothere
Cipher text is :-
n
b
b
b
m
m
m
p
t
t
g
u
n
b
b
b
w
w