Exp: 1B PLAYFAIR CIPHER
Date: 03-02-2024

AIM:

To write a python program implementing playfair cipher algorithm

ALGORITHM:

1. Get the plaintext from the user
2. Get the key from the user
3. Plaintext is encrypted two letters at a time
4. If a pair is a repeated letter, insert filler like 'X'
5. If both letters fall in the same row, replace each with letter to right (wrapping back to start from end)
6. If both letters fall in the same column, replace each with the letter below it (again wrapping to top from bottom)
7. Otherwise each letter is replaced by the letter in the same row and in the column of the other letter of the pair.

PROGRAM:

```
key=input("Enter key: ")
key=key.replace(" ", "")
key=key.upper()
def matrix(x,y,initial):
	return [[initial for i in range(x)] for j in range(y)]
result=list()
for c in key:
	if c not in result:
	if c=='J':
	result.append('I')
	else:
	result.append(c)
flag=0
for i in range(65,91):
	if chr(i) not in result:
	if i==73 and chr(74) not in result:
	result.append("I")
	flag=1
	elif flag==0 and i==73 or i==74:
	pass
	else:
	result.append(chr(i))
k=0
my_matrix=matrix(5,5,0)
for i in range(0,5):
	for j in range(0,5):
	my_matrix[i][j]=result[k]
	k+=1

def locindex(c): #get location of each character
	loc=list()
	if c=='J':
```

```
        c='I'
        for i ,j in enumerate(my_matrix):
        for k,l in enumerate(j):
        if c==l:
                loc.append(i)
                loc.append(k)
                return loc

def encrypt():
        msg=str(input("ENTER MSG:"))
        msg=msg.upper()
        msg=msg.replace(" ", "")
        i=0
        for s in range(0,len(msg)+1,2):
        if s<len(msg)-1:
        if msg[s]==msg[s+1]:
                msg=msg[:s+1]+'X'+msg[s+1:]
        if len(msg)%2!=0:
        msg=msg[:]+'X'
        print("CIPHER TEXT:",end=' ')
        while i<len(msg):
        loc=list()
        loc=locindex(msg[i])
        loc1=list()
        loc1=locindex(msg[i+1])
        if loc[1]==loc1[1]:

        print("{}{}".format(my_matrix[(loc[0]+1)%5][loc[1]],my_matrix[(loc1[0]+1)%5][loc1[1]
]),end=' ')
        elif loc[0]==loc1[0]:

        print("{}{}".format(my_matrix[loc[0]][(loc[1]+1)%5],my_matrix[loc1[0]][(loc1[1]+1)%5
]),end=' ')
        else:
        print("{}{}".format(my_matrix[loc[0]][loc1[1]],my_matrix[loc1[0]][loc[1]]),end=' ')
        i=i+2

def decrypt():  #decryption
        msg=str(input("ENTER CIPHER TEXT:"))
        msg=msg.upper()
        msg=msg.replace(" ", "")
        print("PLAIN TEXT:",end=' ')
        i=0
        while i<len(msg):
        loc=list()
        loc=locindex(msg[i])
        loc1=list()
        loc1=locindex(msg[i+1])
        if loc[1]==loc1[1]:
        print("{}{}".format(my_matrix[(loc[0]-1)%5][loc[1]],my_matrix[(loc1[0]-
1)%5][loc1[1]]),end=' ')
        elif loc[0]==loc1[0]:
        print("{}{}".format(my_matrix[loc[0]][(loc[1]-1)%5],my_matrix[loc1[0]][(loc1[1]-
1)%5]),end=' ')
```

```
        else:
        print("{}{}".format(my_matrix[loc[0]][loc1[1]],my_matrix[loc1[0]][loc[1]]),end=' ')
        i=i+2

while(1):
        choice=int(input("\n 1.Encryption \n 2.Decryption: \n 3.EXIT\nEnter your choice: "))
        if choice==1:
        encrypt()
        elif choice==2:
        decrypt()
        elif choice==3:
        exit()
        else:
        print("Choose correct choice")
```

OUTPUT:

```
┌──(kali㉿kali)-[~]
└─$ vi playfaircipher.py

┌──(kali㉿kali)-[~]
└─$ python3 playfaircipher.py
Enter key: Monarchy

 1.Encryption
 2.Decryption:
 3.EXIT
Enter your Choice: 1
ENTER MSG:Balloon
CIPHER TEXT: IB SU PM NA
 1.Encryption
 2.Decryption:
 3.EXIT
Enter your Choice: 2
ENTER CIPHER TEXT:ibsupmna
PLAIN TEXT: BA LX LO ON
 1.Encryption
 2.Decryption:
 3.EXIT
Enter your Choice: 3
```

RESULT:

Thus the python program for playfair cipher is implemented successfully.