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CLASS: TE-CO ROLL-NO.: 18CO63
EXPERIMENT NO. 02: PLAYFAIR CIPHER USING PYTHON.

PROGRAM:

```
print("\n\t\t PLAYFAIR CIPHER \n")

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):
    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)
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            return loc

def encrypt():
   msg=str(input("\nENTER MESSAGE: "))
   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("\nCIPHER 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

   print("")

def decrypt():
   msg=str(input("\nENTER CIPHER TEXT: "))
   msg=msg.upper()
   msg=msg.replace(" ", "")
   print("\nPLAIN 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=' ')
```
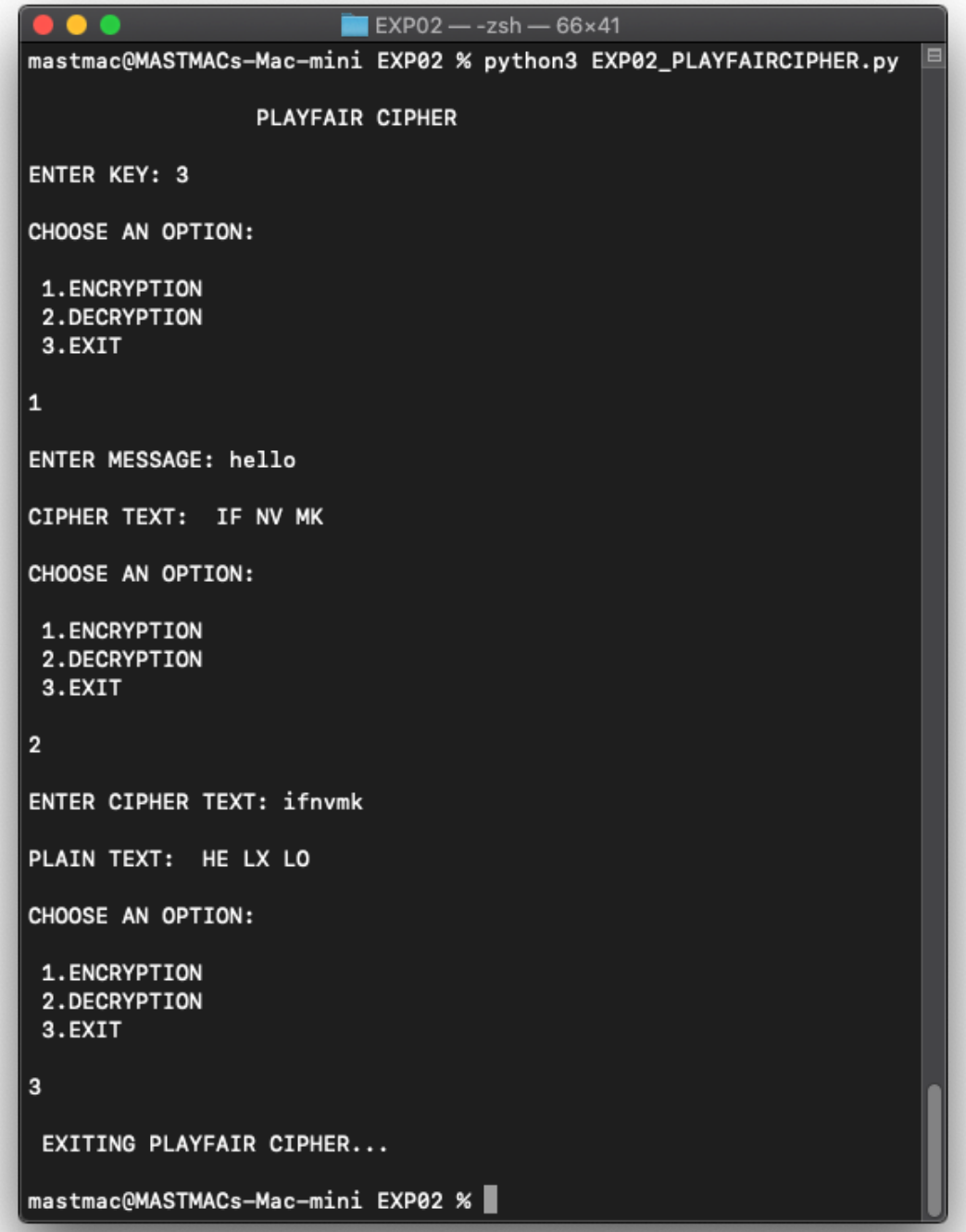

```
        elif loc[0]==loc1[0]:
            print("{}{}".format(my_matrix[loc[0]][(loc[1]-1)%5],my_matrix[loc1[0]][(loc1[1]-
1)%5]),end=' ')
        else:
            print("{}{}".format(my_matrix[loc[0]][loc1[1]],my_matrix[loc1[0]][loc[1]]),end=' ')
        i=i+2

    print("")

while(1):
    print("\nCHOOSE AN OPTION: \n")
    choice=int(input(" 1.ENCRYPTION \n 2.DECRYPTION \n 3.EXIT \n\n"))
    if choice==1:
        encrypt()
    elif choice==2:
        decrypt()
    elif choice==3:
        print("\n EXITING PLAYFAIR CIPHER... \n")
        exit()
    else:
        print("\nINVALID OPTION! CHOOSE CORRECT OPTION \n")
```

OUTPUT:


EXP02 — -zsh — 66×41
mastmac@MASTMACs-Mac-mini EXP02 % python3 EXP02_PLAYFAIRCIPHER.py
PLAYFAIR CIPHER
ENTER KEY: 3
CHOOSE AN OPTION:
1.ENCRYPTION
2.DECRYPTION
3.EXIT
1
ENTER MESSAGE: hello
CIPHER TEXT: IF NV MK
CHOOSE AN OPTION:
1.ENCRYPTION
2.DECRYPTION
3.EXIT
2
ENTER CIPHER TEXT: ifnvmk
PLAIN TEXT: HE LX LO
CHOOSE AN OPTION:
1.ENCRYPTION
2.DECRYPTION
3.EXIT
3
EXITING PLAYFAIR CIPHER...
mastmac@MASTMACs-Mac-mini EXP02 %