Code

Code for decryption

import numpy as np

def proc(r):

    a=r.lower()

    b=a.replace(" ","")

    return b

def same(b):

    for i in range(len(b)-1):

        if (b[i]==b[i+1]):

            b=b[0:i+1]+'z'+b[i+1:]

            b=same(b)

    return b

def even(s):

    if (len(s)%2==0):

        return s

    else:

        s+='z'

        return s

def Diagraph(text):

    Diagraph = []

    group = 0

    for i in range(2, len(text), 2):

        Diagraph.append(text[group:i])

        group = i

    Diagraph.append(text[group:])

    return Diagraph

list1 = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'k', 'l', 'm',

         'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z']

def matrix(w,l):

    p=[]

    for i in w.lower():

        if i not in p:

            p.append(i)

    for j in l:

        if j not in p:

            p.append(j)

    m = np.asarray(p)

    w=m.reshape(5,5)

    return w.tolist()

def search(mat, element):

    for i in range(5):

        for j in range(5):

            if(mat[i][j] == element):

                return i, j

def encrypt\_RowRule(matr, e1r, e1c, e2r, e2c):

    char1 = ''

    if e1c == 0:

        char1 = matr[e1r][4]

    else:

        char1 = matr[e1r][e1c-1]

    char2 = ''

    if e2c == 0:

        char2 = matr[e2r][4]

    else:

        char2 = matr[e2r][e2c-1]

    return char1, char2

def encrypt\_ColumnRule(matr, e1r, e1c, e2r, e2c):

    char1 = ''

    if e1r == 0:

        char1 = matr[4][e1c]

    else:

        char1 = matr[e1r-1][e1c]

    char2 = ''

    if e2r == 0:

        char2 = matr[4][e2c]

    else:

        char2 = matr[e2r-1][e2c]

    return char1, char2

def encrypt\_RectangleRule(matr, e1r, e1c, e2r, e2c):

    char1 = ''

    char1 = matr[e1r][e2c]

    char2 = ''

    char2 = matr[e2r][e1c]

    return char1, char2

def encryptByPlayfairCipher(Matrix, plainList):

    CipherText = []

    for i in range(0, len(plainList)):

        c1 = 0

        c2 = 0

        ele1\_x, ele1\_y = search(Matrix, plainList[i][0])

        ele2\_x, ele2\_y = search(Matrix, plainList[i][1])

        if ele1\_x == ele2\_x:

            c1, c2 = encrypt\_RowRule(Matrix, ele1\_x, ele1\_y, ele2\_x, ele2\_y)

        elif ele1\_y == ele2\_y:

            c1, c2 = encrypt\_ColumnRule(Matrix, ele1\_x, ele1\_y, ele2\_x, ele2\_y)

        else:

            c1, c2 = encrypt\_RectangleRule(

                Matrix, ele1\_x, ele1\_y, ele2\_x, ele2\_y)

        cipher = c1 + c2

        CipherText.append(cipher)

    return CipherText

key=input('Enter the Key: ')

plain=input("Enter the text for decryption: ")

print("Matrix of cipher:",matrix(key,list1))

print("Text division:",Diagraph(proc(plain)))

print("Decrypted Text:",encryptByPlayfairCipher(matrix(key,list1),Diagraph(proc(plain))))

Output:

