

In [1]:

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import numpy as np

keyMatrix = [[0] * 3 for i in range(3)]
messageVector = [[0] for i in range(3)]
cipherMatrix = [[0] for i in range(3)]
plainMatrix = [[0] for i in range(3)]

def getKeyMatrix(key):
    k = 0
    for i in range(3):
        for j in range(3):
            keyMatrix[i][j] = ord(key[k]) % 65
            k = k + 1

def encrypt(messageVector): #(plaintext 3*3 matrix * key 3*1 matrix)%(mod 26)
    for i in range(3):
        for j in range(1):
            cipherMatrix[i][j] = 0
            for x in range(3):
                cipherMatrix[i][j] += (keyMatrix[i][x] * messageVector[x][j])
            cipherMatrix[i][j] = cipherMatrix[i][j] % 26

def HillCipher(message, key):
    getKeyMatrix(key)

    for i in range(3):
        messageVector[i][0] = ord(message[i]) % 65

    encrypt(messageVector)

    CipherText = []
    for i in range(3):
        CipherText.append(chr(cipherMatrix[i][0] + 65))
    print("Ciphertext: ", "".join(CipherText))

message = input("Enter message to be encrypted : ") #ACT
key = input("Enter key : ") #GYBNQKURP

HillCipher(message, key)
```

Enter message to be encrypted : ACT
Enter key : GYBNQKURP
Ciphertext: POH

In []: