10. Write a python program for Playfair matrix:

M F H I/J K

U N O P Q

Z V W X Y

E L A R G

D S T B C

Encrypt this message: Must see you over Cadogan West. Coming at once.

Code:

```
# Playfair matrix
matrix = [
    ['M','F','H','I','K'],
    ['U','N','O','P','Q'],
    ['Z','V','W','X','Y'],
    ['E','L','A','R','G'],
    ['D','S','T','B','C']
]
# Function to find position of a letter in the matrix
def find_pos(ch):
    if ch == 'J': ch = 'I'
    for r in range(5):
        for c in range(5):
            if matrix[r][c] == ch:
                return r, c
# Function to prepare digraphs
def prepare_text(text):
    text = text.upper().replace("J","I").replace(" ","").replace(".","")
    digraphs = []
```

```
    i = 0
    while i < len(text):
        a = text[i]
        b = text[i+1] if i+1 < len(text) else 'X'
        if a == b:
            b = 'X'
            i += 1
        else:
            i += 2
        digraphs.append(a+b)
    return digraphs
# Encrypt function
def encrypt_playfair(text):
    digraphs = prepare_text(text)
    cipher = ""
    for pair in digraphs:
        r1,c1 = find_pos(pair[0])
        r2,c2 = find_pos(pair[1])
        if r1 == r2:
            cipher += matrix[r1][(c1+1)%5] + matrix[r2][(c2+1)%5]
        elif c1 == c2:
            cipher += matrix[(r1+1)%5][c1] + matrix[(r2+1)%5][c2]
        else:
         cipher += matrix[r1][c2] + matrix[r2][c1]
    return cipher
# Message to encrypt
message = "Must see you over Cadogan West. Coming at once."
ciphertext = encrypt_playfair(message)
```

print("Encrypted message:\n", ciphertext)