Write a C 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.

Program:

# Playfair Cipher Encryption with fixed matrix

# 5x5 matrix (I/J treated as the same)

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']

]

# Find position of a character in matrix

def find\_position(ch):

if ch == 'J':

ch = 'I'

for i in range(5):

for j in range(5):

if matrix[i][j] == ch:

return i, j

return None, None

# Prepare plaintext: uppercase, remove non-letters, handle repeats

def prepare\_text(text):

text = ''.join(filter(str.isalpha, text.upper()))

prepared = []

i = 0

while i < len(text):

a = text[i]

if i+1 < len(text):

b = text[i+1]

if a == b:

prepared.append(a)

prepared.append('X')

i += 1

else:

prepared.append(a)

prepared.append(b)

i += 2

else:

prepared.append(a)

prepared.append('X')

i += 1

return prepared

# Encrypt function

def playfair\_encrypt(plaintext):

ciphertext = ""

for i in range(0, len(plaintext), 2):

a, b = plaintext[i], plaintext[i+1]

r1, c1 = find\_position(a)

r2, c2 = find\_position(b)

if r1 == r2: # same row → next right

ciphertext += matrix[r1][(c1 + 1) % 5]

ciphertext += matrix[r2][(c2 + 1) % 5]

elif c1 == c2: # same column → next below

ciphertext += matrix[(r1 + 1) % 5][c1]

ciphertext += matrix[(r2 + 1) % 5][c2]

else: # rectangle → swap columns

ciphertext += matrix[r1][c2]

ciphertext += matrix[r2][c1]

return ciphertext

# --- Main Program ---

plaintext = "Must see you over Cadogan West. Coming at once."

prepared = prepare\_text(plaintext)

ciphertext = playfair\_encrypt(prepared)

print("Plaintext:", plaintext)

print("Prepared Text:", "".join(prepared))

print("Encrypted Ciphertext:", ciphertext)

output:

