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main.c

Run

Output

Clear

```c
#include <stdio.h>
#include <string.h>
#include <ctype.h>
#define MATRIX_SIZE 5
#define ALPHABET_SIZE 25
void create_playfair_matrix(const char *key,
    char matrix[MATRIX_SIZE][MATRIX_SIZE]) {
    int used[26] = {0};
    int k = 0;
    for (int i = 0; key[i] != '\0'; i++) {
        char ch = toupper(key[i]);
        if (ch == 'J') ch = 'I';
        if (ch >= 'A' && ch <= 'Z' && !used[ch -
            'A']) {
            matrix[k / MATRIX_SIZE][k %
                MATRIX_SIZE] = ch;
            used[ch - 'A'] = 1;
            k++;
```

```
Playfair Cipher Matrix:
M F H I K
U N O P Q
Z V X Y E
L A R G D
S T B C W
Plaintext: Must see you over Cadogan West. Coming at
    once.
Ciphertext: UZTBWZZEPNNXXDTGRQDRQTZWBWUHFPDRBNPTZY


=== Code Execution Successful ===
```

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```c
    }
}
void prepare_message(const char *message, char
    *prepared_message) {
    int j = 0;
    for (int i = 0; message[i] != '\0'; i++) {
        char ch = toupper(message[i]);
        if (ch == 'J') ch = 'I';  // Treat I and
            J as the same letter
        if (ch >= 'A' && ch <= 'Z') {
            prepared_message[j++] = ch;
        }
    }
    if (j % 2 != 0) {
        prepared_message[j++] = 'X';
    }
    prepared_message[j] = '\0';
}
```

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```
50 void playfair_encrypt(const char *message, char
       *ciphertext, char
       matrix[MATRIX_SIZE][MATRIX_SIZE]) {
51     int i = 0;
52     while (message[i] != '\0') {
53         char first = message[i++];
54         char second = message[i++];
55         int row1, col1, row2, col2;
56         find_position(first, matrix, &row1,
               &col1);
57         find_position(second, matrix, &row2,
               &col2);
58         if (row1 == row2) {
59             ciphertext[i - 2] = matrix[row1][
                   (col1 + 1) % MATRIX_SIZE];
60             ciphertext[i - 1] = matrix[row2][
                   (col2 + 1) % MATRIX_SIZE];
61         } else if (col1 == col2) {
```

```
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```c
}
int main() {
    const char *key = "MFHIKUNOPQZVXYELARGDSTBC"
        ;
    char matrix[MATRIX_SIZE][MATRIX_SIZE];
    create_playfair_matrix(key, matrix);
    printf("Playfair Cipher Matrix:\n");
    for (int i = 0; i < MATRIX_SIZE; i++) {
        for (int j = 0; j < MATRIX_SIZE; j++) {
            printf("%c ", matrix[i][j]);
        }
        printf("\n");
    }
    const char *plaintext = "Must see you over
        Cadogan West. Coming at once.";
    char prepared_message[100];
    prepare_message(plaintext, prepared_message
        );
    char ciphertext[strlen(prepared_message) +
```

```
Playfair Cipher Matrix:
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```c
        printf("%c ", matrix[i][j]);
    }
    printf("\n");
}
const char *plaintext = "Must see you over Cadogan West. Coming at once.";
char prepared_message[100];
prepare_message(plaintext, prepared_message);
char ciphertext[strlen(prepared_message) + 1];
playfair_encrypt(prepared_message, ciphertext, matrix);
printf("Plaintext: %s\n", plaintext);
printf("Ciphertext: %s\n", ciphertext);

return 0;
}
```

```
Playfair Cipher Matrix:
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