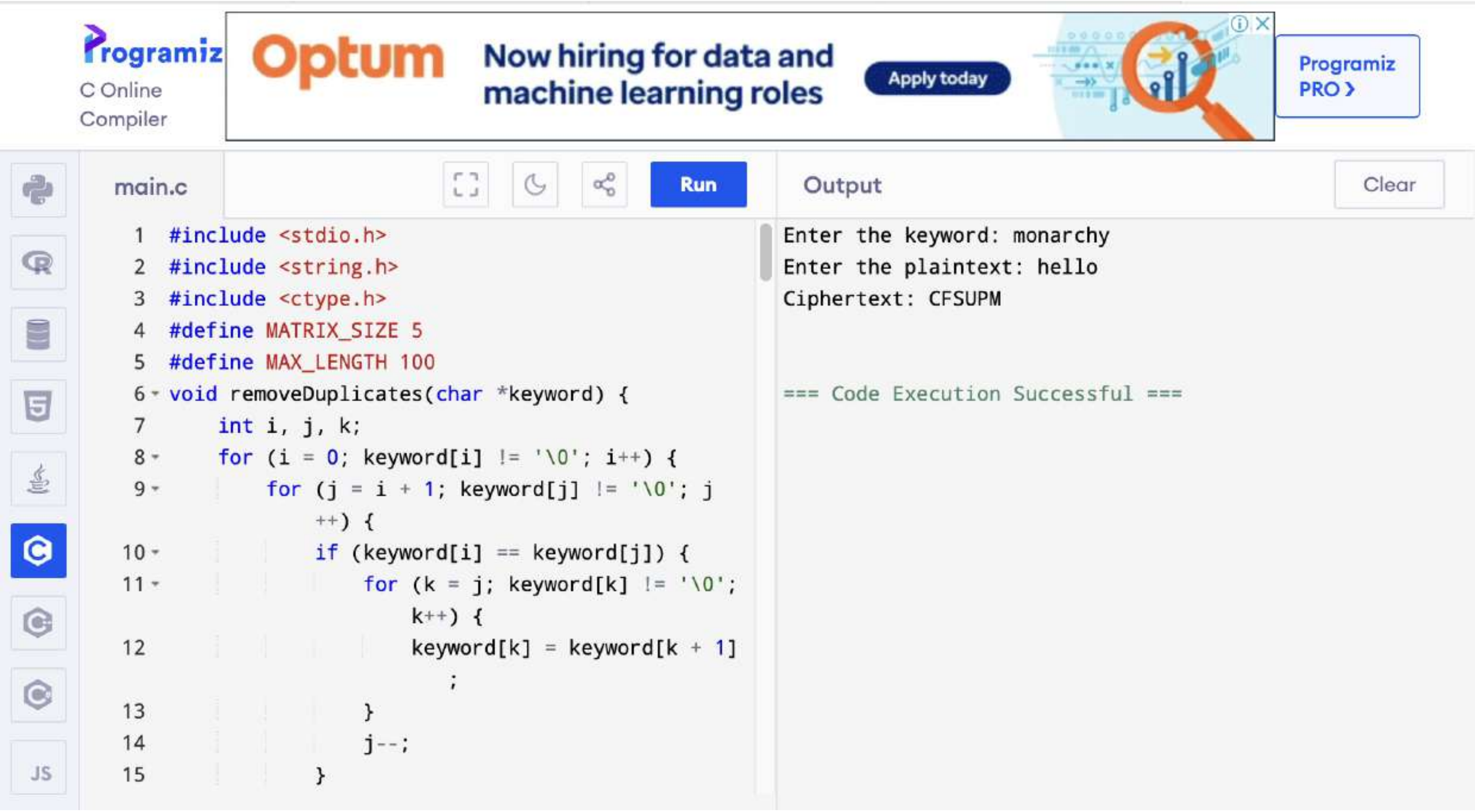
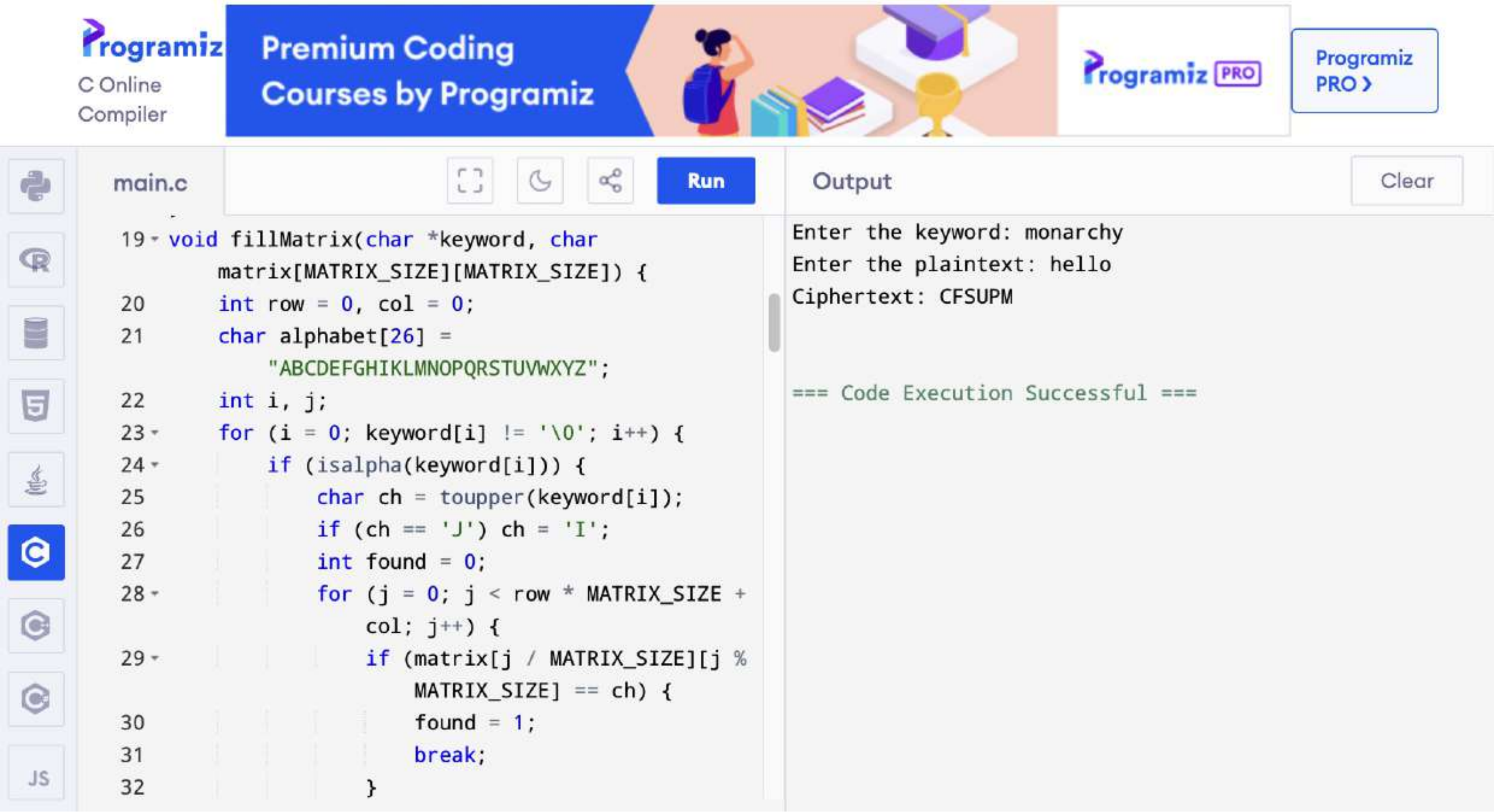


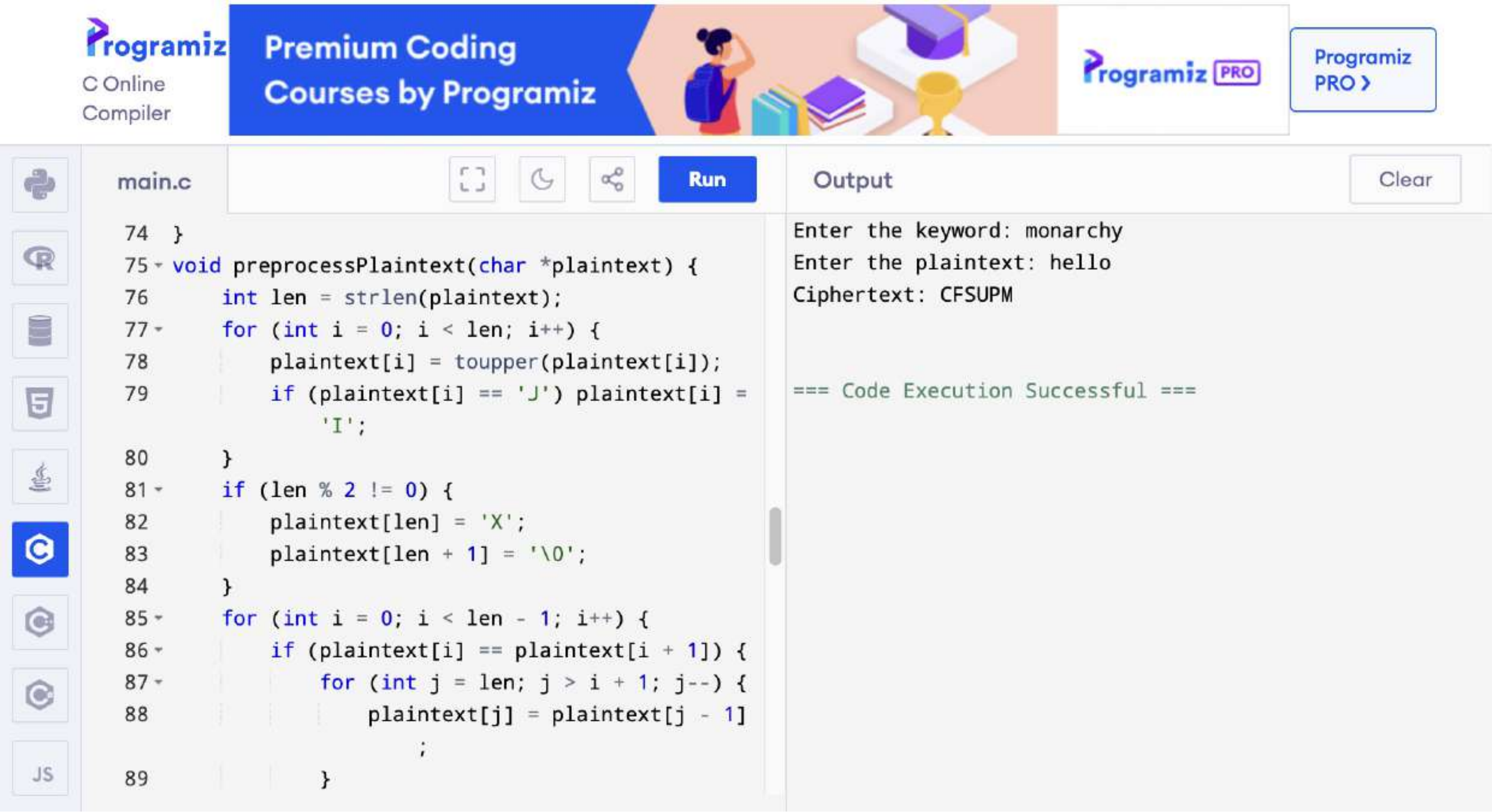
```c
#include <stdio.h>
#include <string.h>
#include <ctype.h>
#define MATRIX_SIZE 5
#define MAX_LENGTH 100
void removeDuplicates(char *keyword) {
    int i, j, k;
    for (i = 0; keyword[i] != '\0'; i++) {
        for (j = i + 1; keyword[j] != '\0'; j++) {
            if (keyword[i] == keyword[j]) {
                for (k = j; keyword[k] != '\0'; k++) {
                    keyword[k] = keyword[k + 1];
                }
                j--;
            }
```

```
Enter the keyword: monarchy
Enter the plaintext: hello
Ciphertext: CFSUPM


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



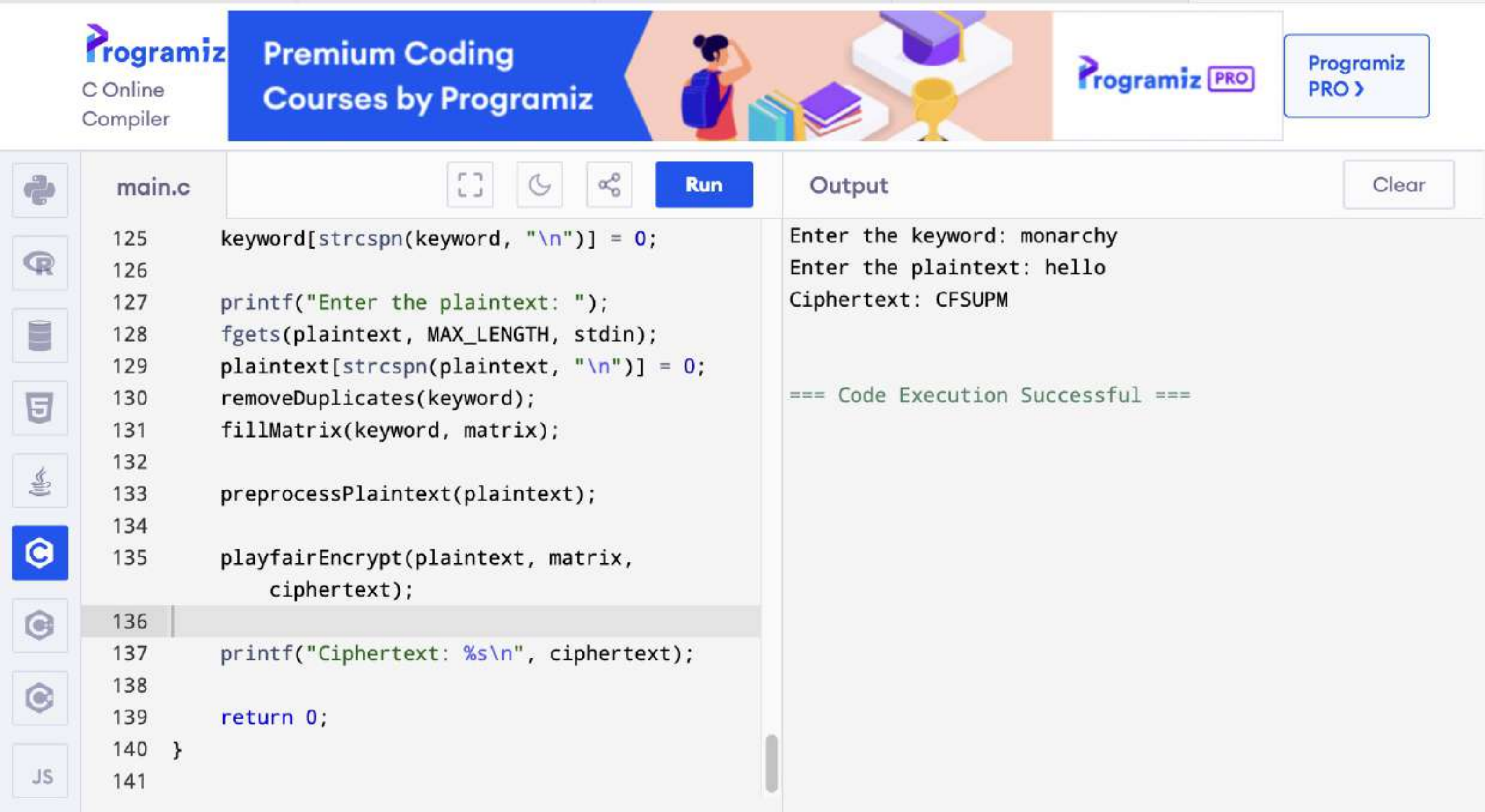
```c
void fillMatrix(char *keyword, char matrix[MATRIX_SIZE][MATRIX_SIZE]) {
    int row = 0, col = 0;
    char alphabet[26] = "ABCDEFGHIKLMNOPQRSTUVWXYZ";
    int i, j;
    for (i = 0; keyword[i] != '\0'; i++) {
        if (isalpha(keyword[i])) {
            char ch = toupper(keyword[i]);
            if (ch == 'J') ch = 'I';
            int found = 0;
            for (j = 0; j < row * MATRIX_SIZE + col; j++) {
                if (matrix[j / MATRIX_SIZE][j % MATRIX_SIZE] == ch) {
                    found = 1;
                    break;
                }
```

```
Enter the keyword: monarchy
Enter the plaintext: hello
Ciphertext: CFSUPM


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



```c
}
void preprocessPlaintext(char *plaintext) {
    int len = strlen(plaintext);
    for (int i = 0; i < len; i++) {
        plaintext[i] = toupper(plaintext[i]);
        if (plaintext[i] == 'J') plaintext[i] = 'I';
    }
    if (len % 2 != 0) {
        plaintext[len] = 'X';
        plaintext[len + 1] = '\0';
    }
    for (int i = 0; i < len - 1; i++) {
        if (plaintext[i] == plaintext[i + 1]) {
            for (int j = len; j > i + 1; j--) {
                plaintext[j] = plaintext[j - 1];
            }
```

```
Enter the keyword: monarchy
Enter the plaintext: hello
Ciphertext: CFSUPM


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



```
    keyword[strcspn(keyword, "\n")] = 0;

    printf("Enter the plaintext: ");
    fgets(plaintext, MAX_LENGTH, stdin);
    plaintext[strcspn(plaintext, "\n")] = 0;
    removeDuplicates(keyword);
    fillMatrix(keyword, matrix);

    preprocessPlaintext(plaintext);

    playfairEncrypt(plaintext, matrix,
        ciphertext);

    printf("Ciphertext: %s\n", ciphertext);

    return 0;
}
```

```
Enter the keyword: monarchy
Enter the plaintext: hello
Ciphertext: CFSUPM


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