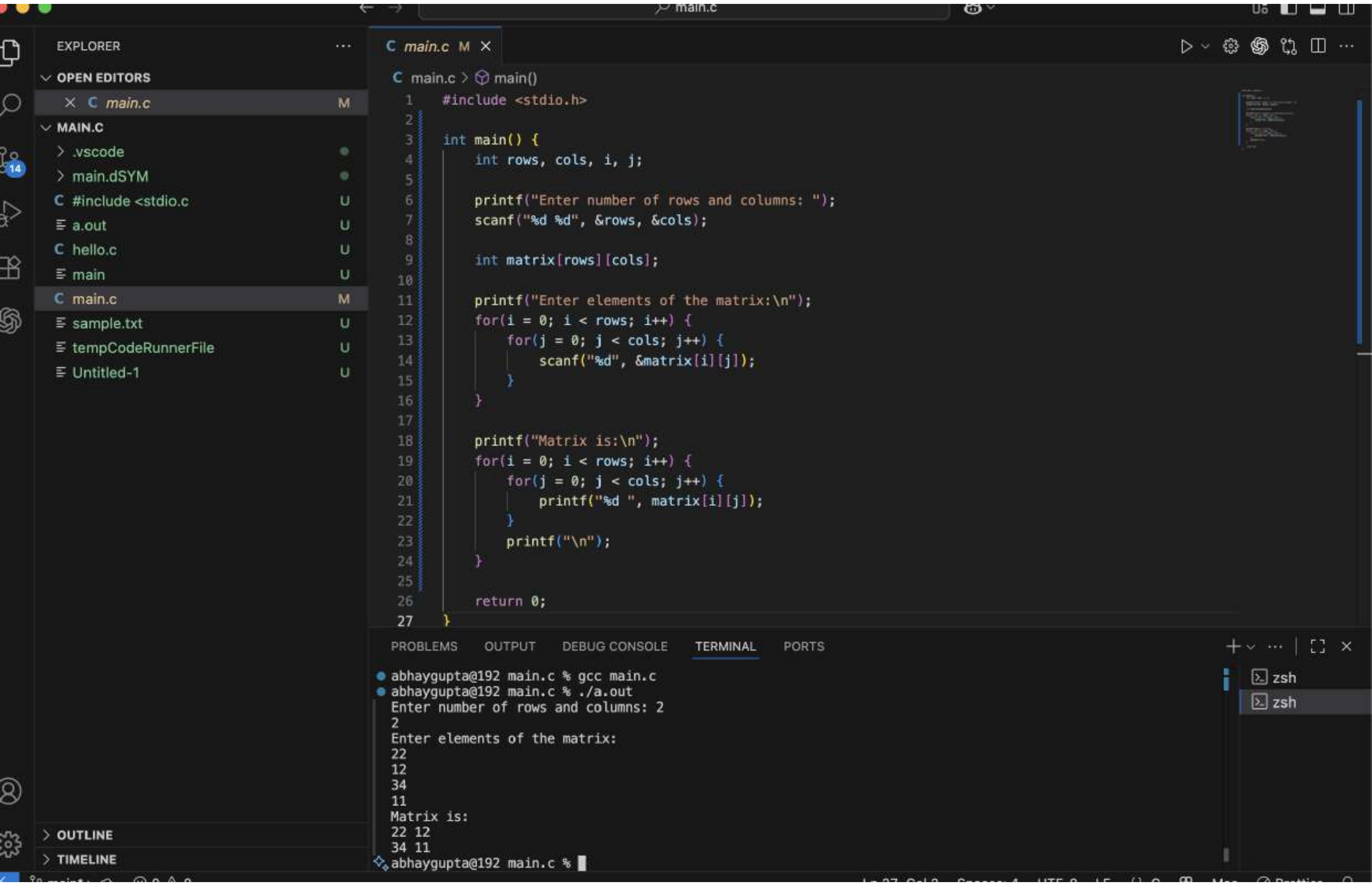
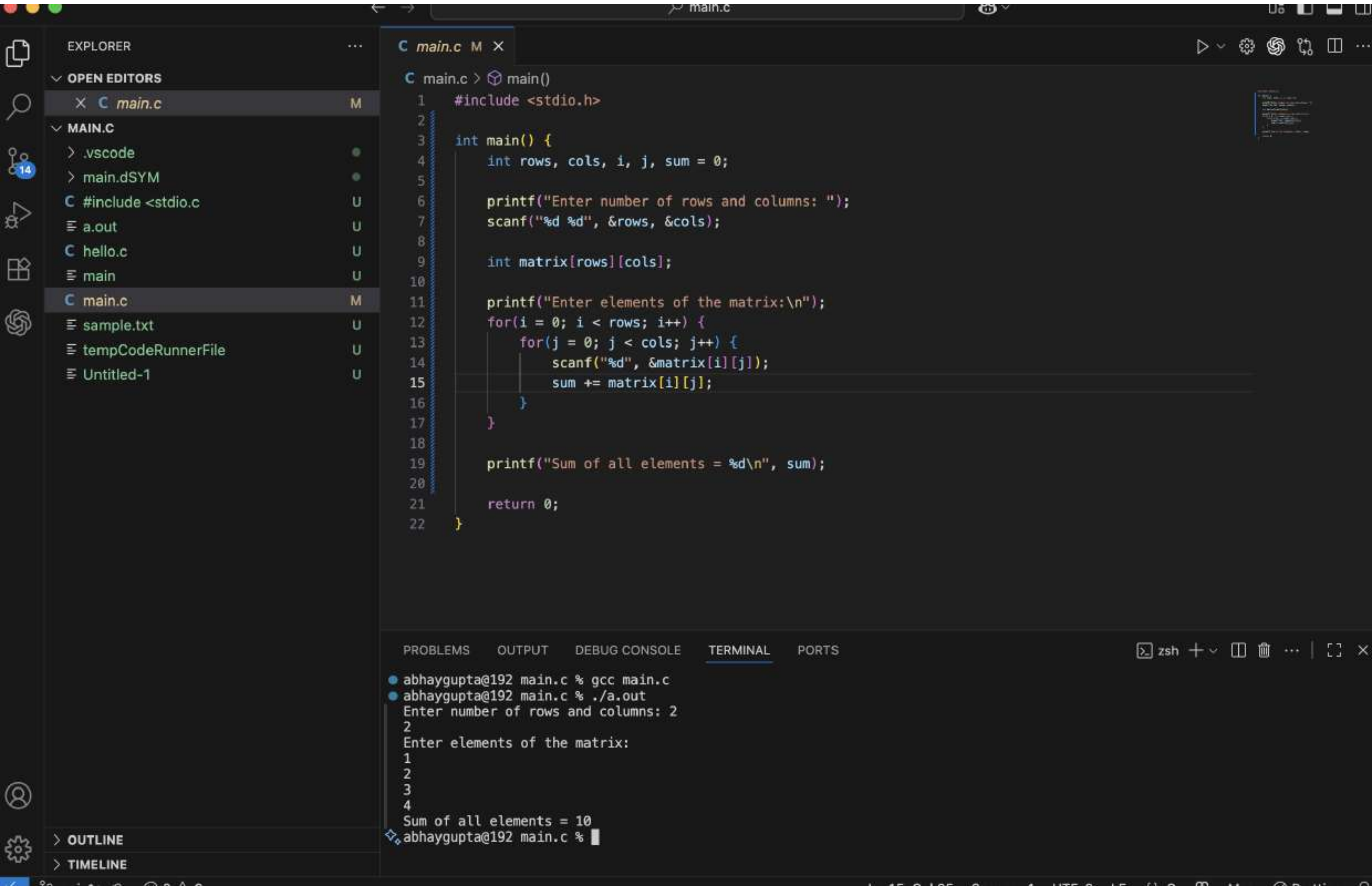


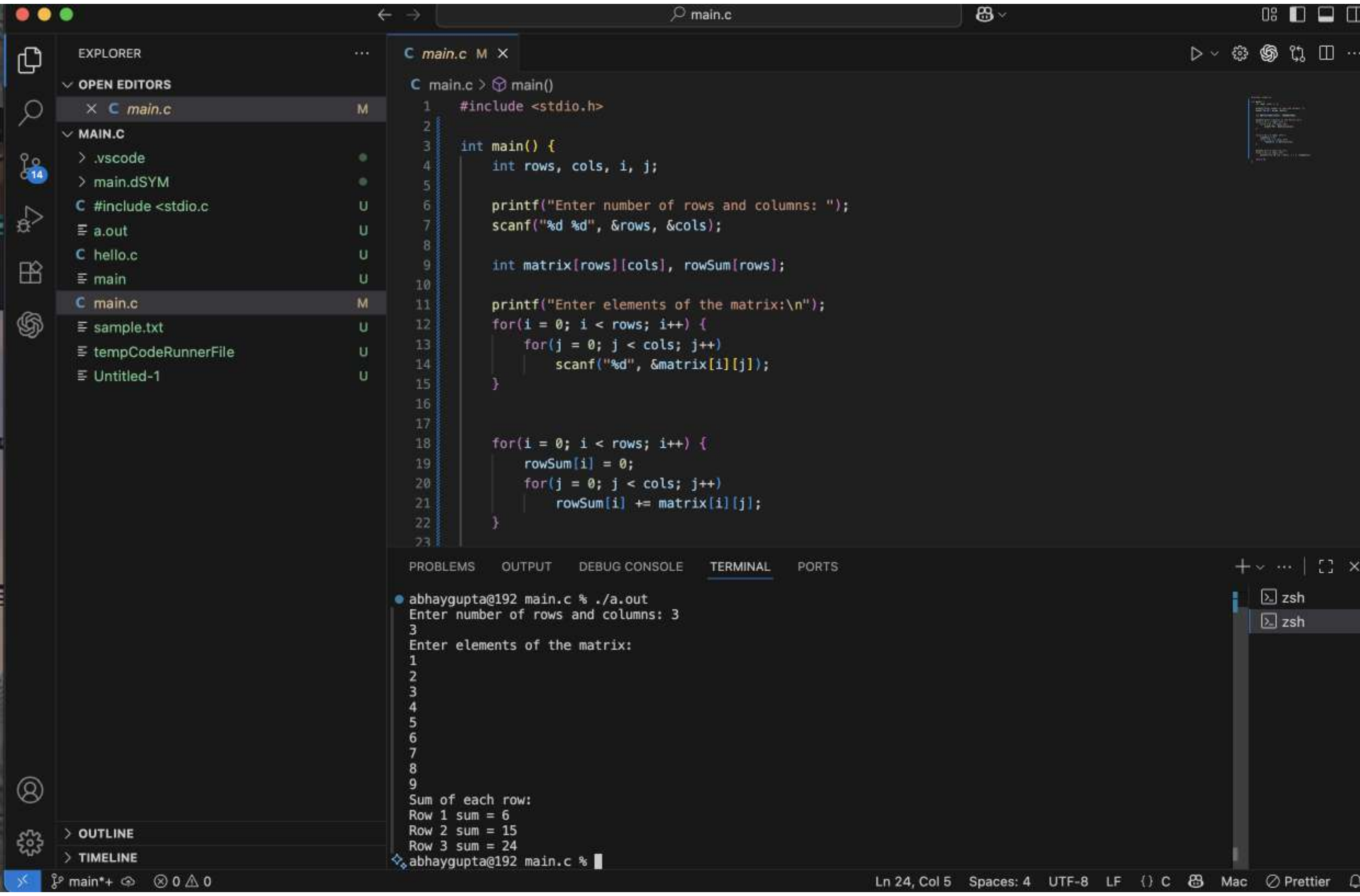
```c
#include <stdio.h>

int main() {
    int rows, cols, i, j;

    printf("Enter number of rows and columns: ");
    scanf("%d %d", &rows, &cols);

    int matrix[rows][cols];

    printf("Enter elements of the matrix:\n");
    for(i = 0; i < rows; i++) {
        for(j = 0; j < cols; j++) {
            scanf("%d", &matrix[i][j]);
        }
    }

    printf("Matrix is:\n");
    for(i = 0; i < rows; i++) {
        for(j = 0; j < cols; j++) {
            printf("%d ", matrix[i][j]);
        }
        printf("\n");
    }

    return 0;
}
```

```
abhaygupta@192 main.c % gcc main.c
abhaygupta@192 main.c % ./a.out
Enter number of rows and columns: 2
2
Enter elements of the matrix:
22
12
34
11
Matrix is:
22 12
34 11
abhaygupta@192 main.c % 
```



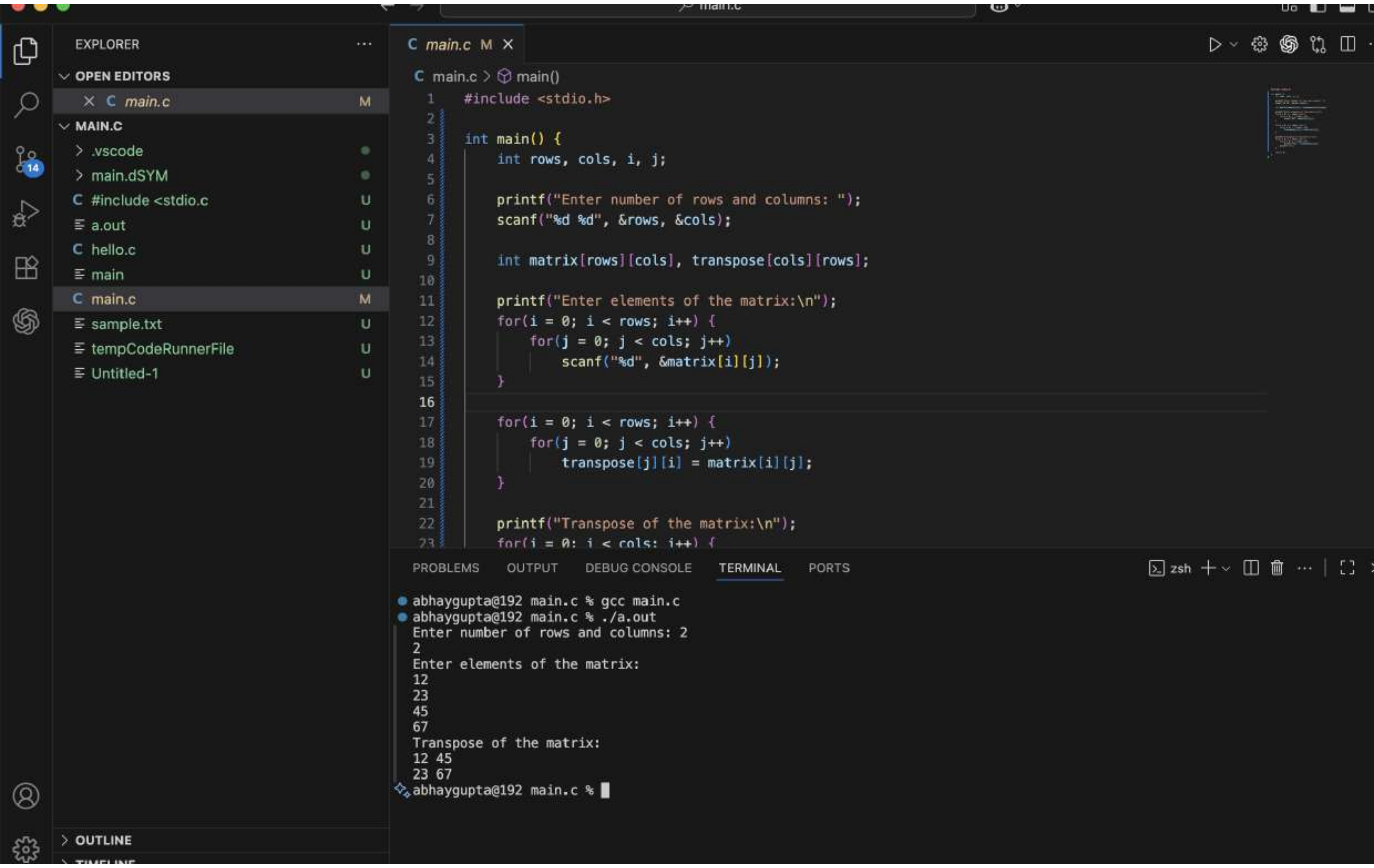
```c
#include <stdio.h>

int main() {
    int rows, cols, i, j, sum = 0;

    printf("Enter number of rows and columns: ");
    scanf("%d %d", &rows, &cols);

    int matrix[rows][cols];

    printf("Enter elements of the matrix:\n");
    for(i = 0; i < rows; i++) {
        for(j = 0; j < cols; j++) {
            scanf("%d", &matrix[i][j]);
            sum += matrix[i][j];
        }
    }

    printf("Sum of all elements = %d\n", sum);

    return 0;
}
```

```
abhaygupta@192 main.c % gcc main.c
abhaygupta@192 main.c % ./a.out
Enter number of rows and columns: 2
2
Enter elements of the matrix:
1
2
3
4
Sum of all elements = 10
abhaygupta@192 main.c %
```



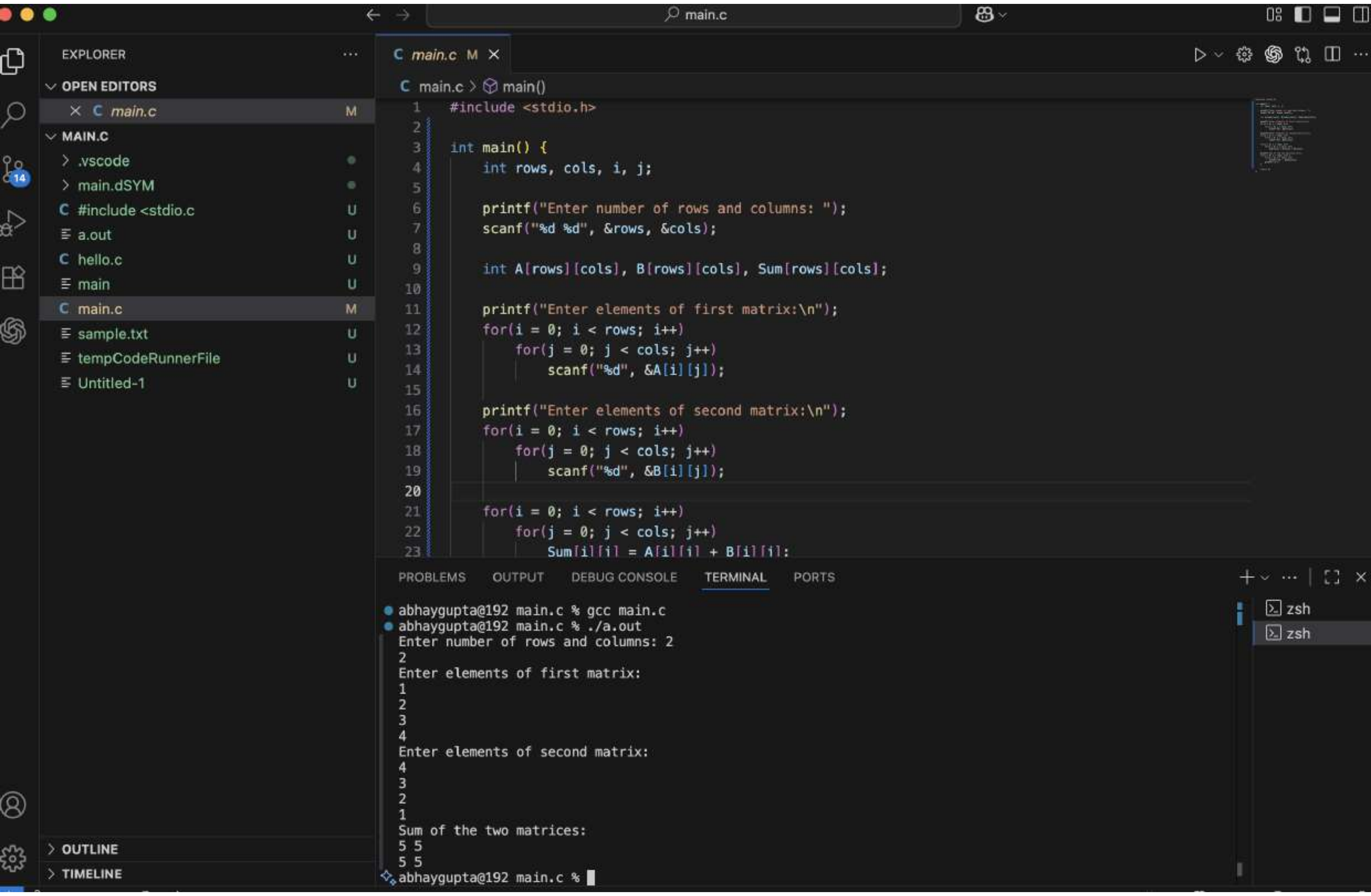
```c
#include <stdio.h>

int main() {
    int rows, cols, i, j;

    printf("Enter number of rows and columns: ");
    scanf("%d %d", &rows, &cols);

    int matrix[rows][cols], rowSum[rows];

    printf("Enter elements of the matrix:\n");
    for(i = 0; i < rows; i++) {
        for(j = 0; j < cols; j++)
            scanf("%d", &matrix[i][j]);
    }


    for(i = 0; i < rows; i++) {
        rowSum[i] = 0;
        for(j = 0; j < cols; j++)
            rowSum[i] += matrix[i][j];
    }
```

```
abhaygupta@192 main.c % ./a.out
Enter number of rows and columns: 3
3
Enter elements of the matrix:
1
2
3
4
5
6
7
8
9
Sum of each row:
Row 1 sum = 6
Row 2 sum = 15
Row 3 sum = 24
abhaygupta@192 main.c %
```



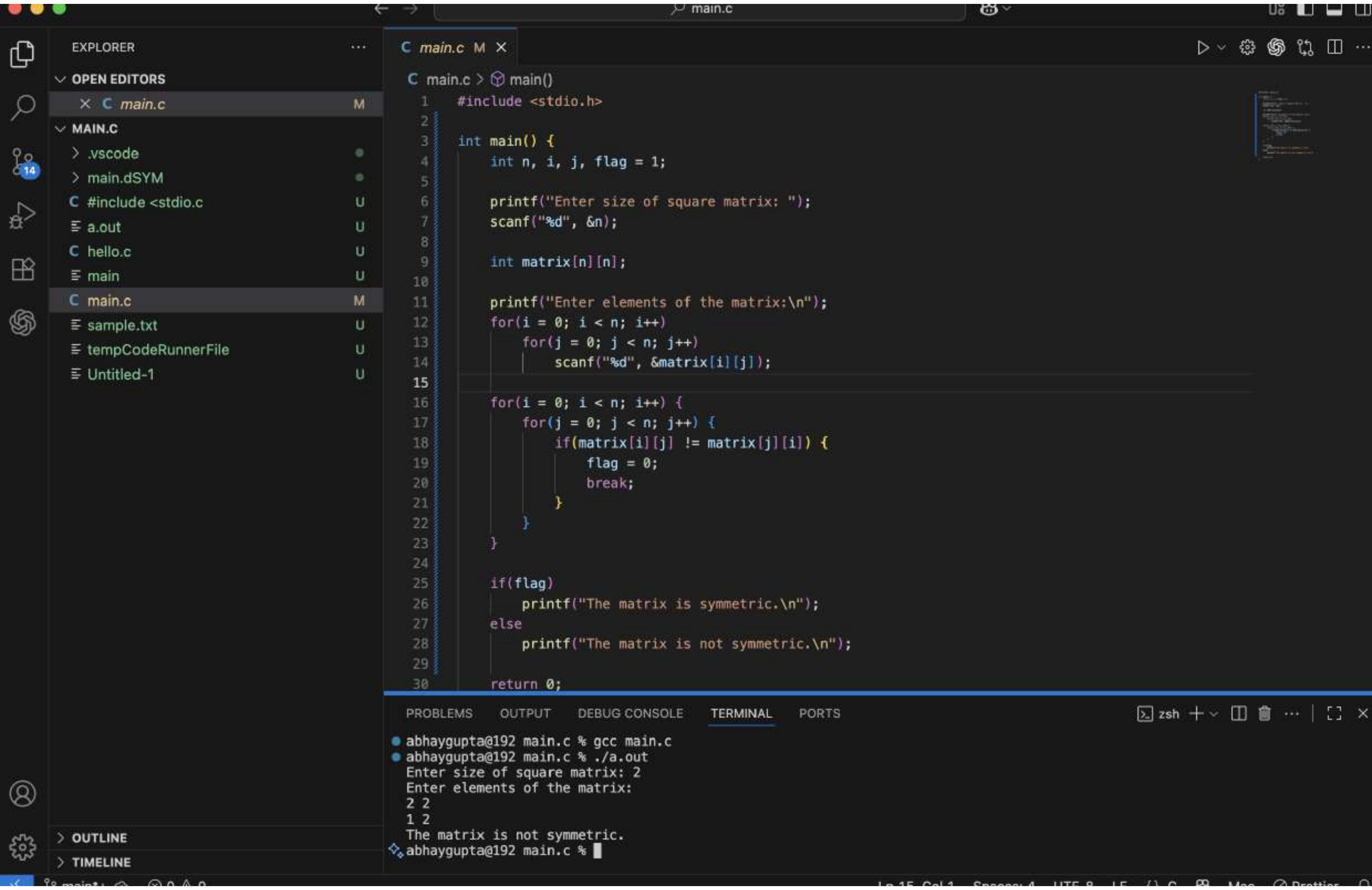
```c
#include <stdio.h>

int main() {
    int rows, cols, i, j;

    printf("Enter number of rows and columns: ");
    scanf("%d %d", &rows, &cols);

    int matrix[rows][cols], transpose[cols][rows];

    printf("Enter elements of the matrix:\n");
    for(i = 0; i < rows; i++) {
        for(j = 0; j < cols; j++)
            scanf("%d", &matrix[i][j]);
    }

    for(i = 0; i < rows; i++) {
        for(j = 0; j < cols; j++)
            transpose[j][i] = matrix[i][j];
    }

    printf("Transpose of the matrix:\n");
    for(i = 0; i < cols; i++) {
```

```
abhaygupta@192 main.c % gcc main.c
abhaygupta@192 main.c % ./a.out
Enter number of rows and columns: 2
2
Enter elements of the matrix:
12
23
45
67
Transpose of the matrix:
12 45
23 67
abhaygupta@192 main.c % █
```



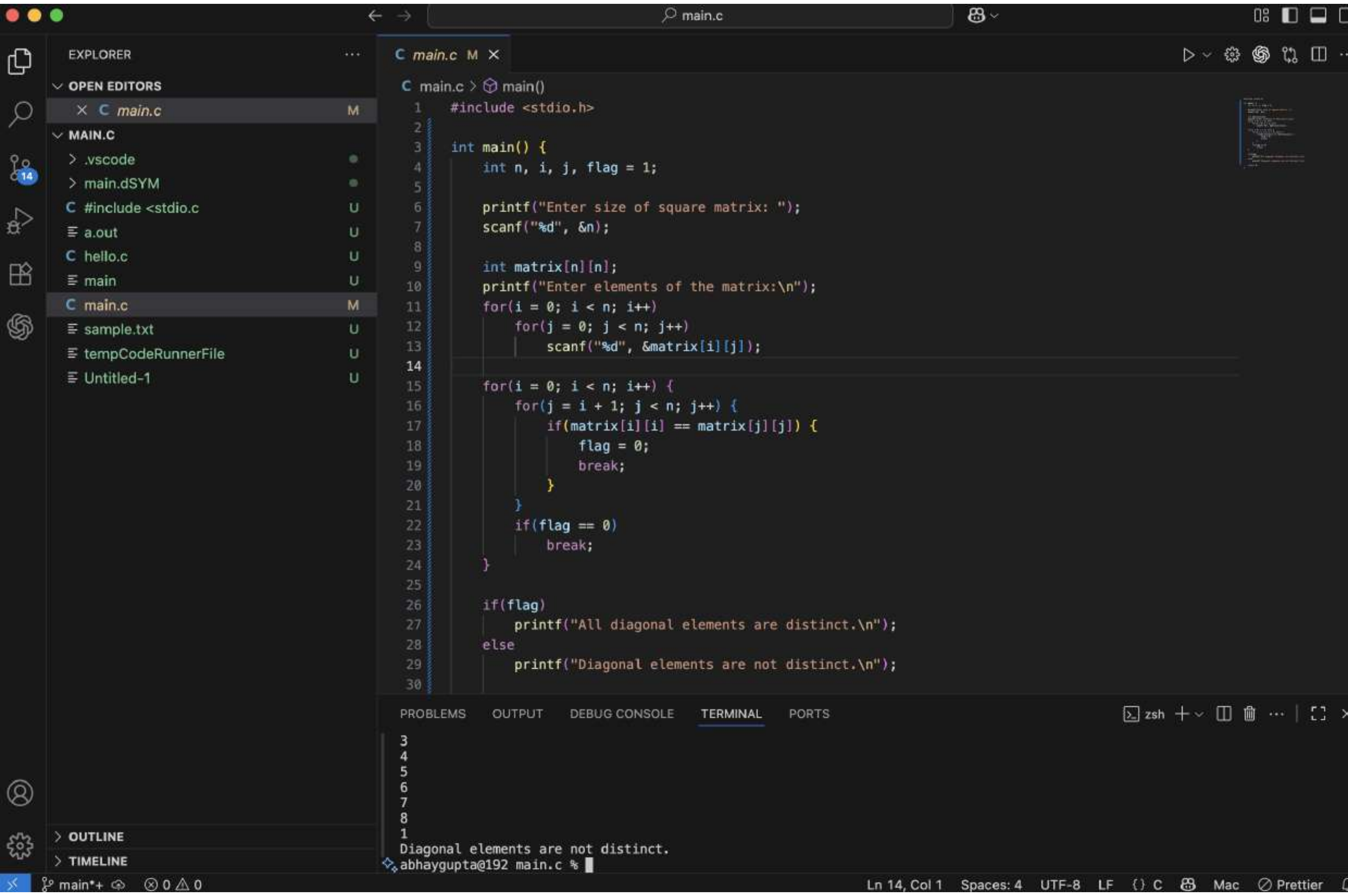
```c
#include <stdio.h>

int main() {
    int rows, cols, i, j;

    printf("Enter number of rows and columns: ");
    scanf("%d %d", &rows, &cols);

    int A[rows][cols], B[rows][cols], Sum[rows][cols];

    printf("Enter elements of first matrix:\n");
    for(i = 0; i < rows; i++)
        for(j = 0; j < cols; j++)
            scanf("%d", &A[i][j]);

    printf("Enter elements of second matrix:\n");
    for(i = 0; i < rows; i++)
        for(j = 0; j < cols; j++)
            scanf("%d", &B[i][j]);

    for(i = 0; i < rows; i++)
        for(j = 0; j < cols; j++)
            Sum[i][j] = A[i][j] + B[i][j];
```

```
abhaygupta@192 main.c % gcc main.c
abhaygupta@192 main.c % ./a.out
Enter number of rows and columns: 2
2
Enter elements of first matrix:
1
2
3
4
Enter elements of second matrix:
4
3
2
1
Sum of the two matrices:
5 5
5 5
abhaygupta@192 main.c % 
```



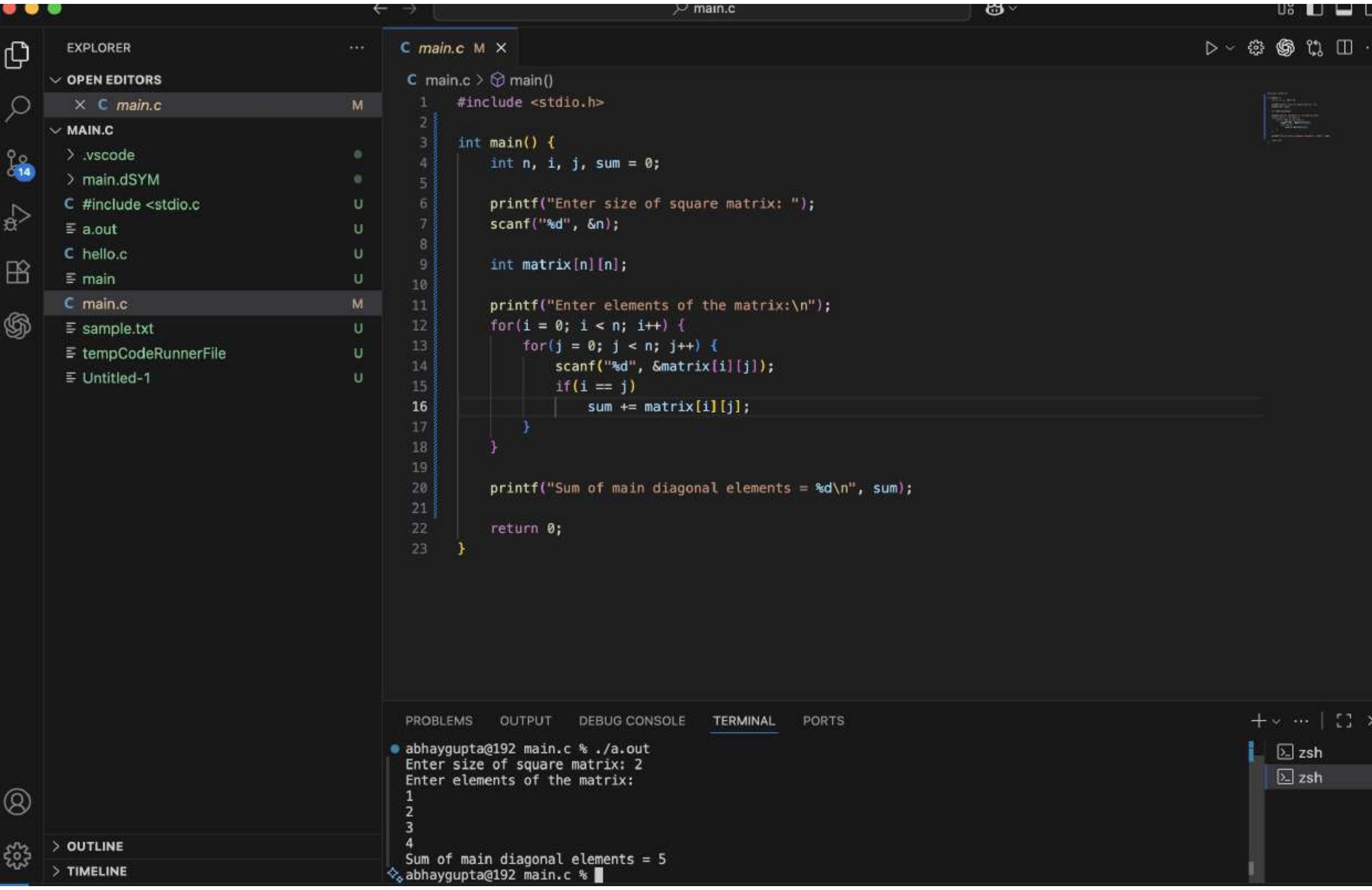
```c
#include <stdio.h>

int main() {
    int n, i, j, flag = 1;

    printf("Enter size of square matrix: ");
    scanf("%d", &n);

    int matrix[n][n];

    printf("Enter elements of the matrix:\n");
    for(i = 0; i < n; i++)
        for(j = 0; j < n; j++)
            scanf("%d", &matrix[i][j]);

    for(i = 0; i < n; i++) {
        for(j = 0; j < n; j++) {
            if(matrix[i][j] != matrix[j][i]) {
                flag = 0;
                break;
            }
        }
    }

    if(flag)
        printf("The matrix is symmetric.\n");
    else
        printf("The matrix is not symmetric.\n");

    return 0;
```

```
abhaygupta@192 main.c % gcc main.c
abhaygupta@192 main.c % ./a.out
Enter size of square matrix: 2
Enter elements of the matrix:
2 2
1 2
The matrix is not symmetric.
abhaygupta@192 main.c %
```



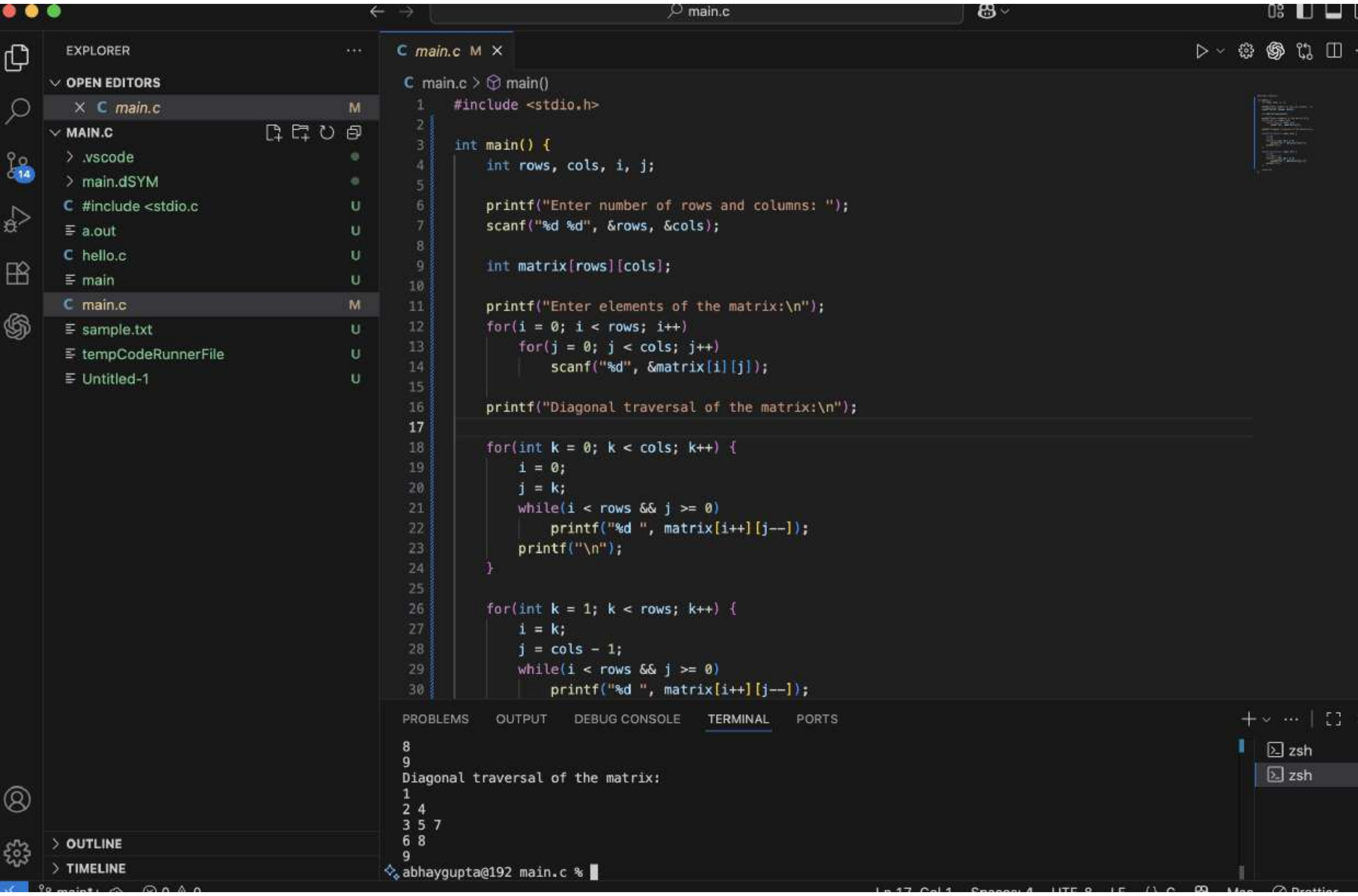
```c
#include <stdio.h>

int main() {
    int n, i, j, flag = 1;

    printf("Enter size of square matrix: ");
    scanf("%d", &n);

    int matrix[n][n];
    printf("Enter elements of the matrix:\n");
    for(i = 0; i < n; i++)
        for(j = 0; j < n; j++)
            scanf("%d", &matrix[i][j]);

    for(i = 0; i < n; i++) {
        for(j = i + 1; j < n; j++) {
            if(matrix[i][i] == matrix[j][j]) {
                flag = 0;
                break;
            }
        }
        if(flag == 0)
            break;
    }

    if(flag)
        printf("All diagonal elements are distinct.\n");
    else
        printf("Diagonal elements are not distinct.\n");

```

```
3
4
5
6
7
8
1
Diagonal elements are not distinct.
abhaygupta@192 main.c %
```



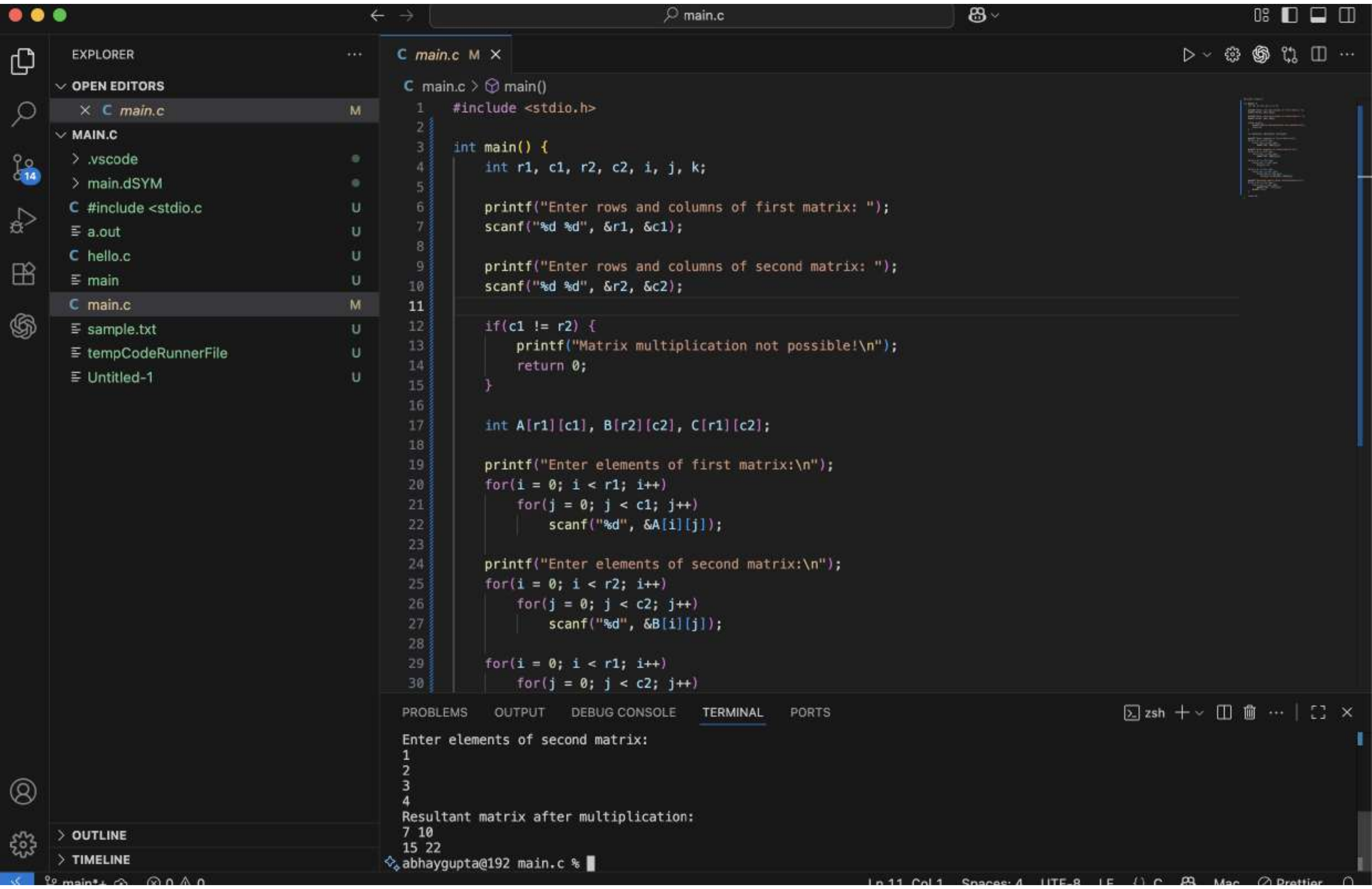
```c
#include <stdio.h>

int main() {
    int n, i, j, sum = 0;

    printf("Enter size of square matrix: ");
    scanf("%d", &n);

    int matrix[n][n];

    printf("Enter elements of the matrix:\n");
    for(i = 0; i < n; i++) {
        for(j = 0; j < n; j++) {
            scanf("%d", &matrix[i][j]);
            if(i == j)
                sum += matrix[i][j];
        }
    }

    printf("Sum of main diagonal elements = %d\n", sum);

    return 0;
}
```

```
abhaygupta@192 main.c % ./a.out
Enter size of square matrix: 2
Enter elements of the matrix:
1
2
3
4
Sum of main diagonal elements = 5
abhaygupta@192 main.c %
```



```c
#include <stdio.h>

int main() {
    int rows, cols, i, j;

    printf("Enter number of rows and columns: ");
    scanf("%d %d", &rows, &cols);

    int matrix[rows][cols];

    printf("Enter elements of the matrix:\n");
    for(i = 0; i < rows; i++)
        for(j = 0; j < cols; j++)
            scanf("%d", &matrix[i][j]);

    printf("Diagonal traversal of the matrix:\n");

    for(int k = 0; k < cols; k++) {
        i = 0;
        j = k;
        while(i < rows && j >= 0)
            printf("%d ", matrix[i++][j--]);
        printf("\n");
    }

    for(int k = 1; k < rows; k++) {
        i = k;
        j = cols - 1;
        while(i < rows && j >= 0)
            printf("%d ", matrix[i++][j--]);
```

```
8
9
Diagonal traversal of the matrix:
1
2 4
3 5 7
6 8
9
abhaygupta@192 main.c %
```



```c
#include <stdio.h>

int main() {
    int r1, c1, r2, c2, i, j, k;

    printf("Enter rows and columns of first matrix: ");
    scanf("%d %d", &r1, &c1);

    printf("Enter rows and columns of second matrix: ");
    scanf("%d %d", &r2, &c2);

    if(c1 != r2) {
        printf("Matrix multiplication not possible!\n");
        return 0;
    }

    int A[r1][c1], B[r2][c2], C[r1][c2];

    printf("Enter elements of first matrix:\n");
    for(i = 0; i < r1; i++)
        for(j = 0; j < c1; j++)
            scanf("%d", &A[i][j]);

    printf("Enter elements of second matrix:\n");
    for(i = 0; i < r2; i++)
        for(j = 0; j < c2; j++)
            scanf("%d", &B[i][j]);

    for(i = 0; i < r1; i++)
        for(j = 0; j < c2; j++)
```

```
Enter elements of second matrix:
1
2
3
4
Resultant matrix after multiplication:
7 10
15 22
abhaygupta@192 main.c % 
```