Lab 2.9.5 Two-dimensional square array – symmetric or not?

Objectives

Familiarize the student with:

- using two-dimensional arrays (matrices) and their initializers;
- using nested **for** loops to iterate through rows and columns.

Scenario

A matrix (a two-dimensional array) is **symmetric** if:

- it's a square matrix (its sides are equal);
- its elements are placed symmetrically about the main diagonal (the diagonal that goes from the upper-left to the bottom-right vertex).

To be clear – this is a symmetric matrix:

```
1 2 3
2 1 2
3 2 1
```

and this is not:

```
1 2 3
2 1 2
4 2 1
```

The code below declares a 4×4 matrix initially filled with some data. Your task is to complete the code and to answer the fundamental question: is this matrix symmetric or not?

When you complete your code, play with the matrix a bit: change its dimensions, move some of the elements – be sure that your code works well in any situation.

```cpp
#include <iostream>

using namespace std;

int main(void) {

 double matrix[][4] = {  { 1, 2, 3, 4 },
        { 2, 2, 3, 1 },
        { 3, 3, 3, 2 },
        { 4, 1, 2, 4 }   };

 int side = sizeof(matrix[0]) / sizeof(matrix[0][0]);
 bool issymmetric = true;

 // Insert your code here

 if(issymmetric)
  cout << "The matrix is symmetric" << endl;
 else
  cout << "The matrix is not symmetric" << endl;
 return 0;
}
```