Is identity? X35986_en

Write a function `is_identity` that, given a non-empty integer matrix A, returns true if and only if A is an identity matrix, that is, if it is a square matrix and all its components are zeros, except those in the main diagonal which must be ones.
Use the C++ code below, so that your function will be run with several input cases. You must add code only in the parts marked with ..., respecting the rest and making an adequate use of it with the appropriate calls and declarations.

```
#include <iostream>
#include <vector>
using namespace std;

typedef vector<int> Row;
typedef vector<Row> Matrix;

// Reads a matrix  with n rows and m columns
// from the input and returns it. Assumes
// that the input format is
// a00 ... a0(m-1) a10 ... a1(m-1) ... a(n-1)0 ... a(n-1)(m-1)
Matrix read_matrix(int n, int m)
{
   Matrix M(n, Row(m));
   for (int i = 0; i < n; ++i)
      for (int j = 0; j < m; ++j)
          cin >> M[i][j];
   return M;
}

// returns true iff the given non-empty matrix A is an
// identity matrix
bool is_identity(const Matrix& A) {
     ...
}

int main() {
    int n,m;
    while (cin >> n >> m) {
        Matrix A = read_matrix(n, m);
        if (is_identity(A))
         cout << "yes" << endl;
        else
         cout << "no" << endl;
    }
}
```

Exam score: 2.5 **Automatic part:** 100%

Input

The input consists in a sequence of matrices. For every matrix we have its dimensions $n, m \geq 1$, followed by its elements in row order. Every integer is separated by the next one by a blank space and each row is ended with a line break. Two consecutive matrices are separated by a blank line.

Output

The program writes ”yes” or ”no” for every matrix in the input, depending on whether the matrix in the input is an identity matrix or not.

Sample input

```
2 2
1 -1
0 1

1 2
1 0

2 2
1 0
0 1

2 2
0 1
1 0

3 4
1 0 0 0
0 1 0 0
0 0 1 0

2 2
1 0
0 0

2 2
0 0
0 1

3 3
1 0 0
0 1 0
0 0 1

3 3
1 0 0
0 0 1
0 1 0

1 1
0

1 1
1
```

Sample output

```
no
no
yes
no
no
no
no
yes
no
no
yes
```

Problem information

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