Inverse of a square matrix

Problem definition

One way to find the inverse of a square matirx is by Gauss-Jordan elimination. In order to finish this homework, you need to read the description under the subtitle of "Finding the inverse of a matrix" at the Wikipedia for Gaussian elimiation. You can also check out the following videos to grasp the idea quickly:

- Inverse Matrix Using Gauss-Jordan / Row Reduction , Example 1
- Inverse Matrix Using Gauss-Jordan / Row Reduction , Example 2

Write a program to calculate the inverse of a given matrix A. (We shall denote the inverse as B.) The input format is shown next:

```
n ← The number of rows (also the number of columns) of A
a11 a12 . . . . . a1n ← the n numbers of row 1 of A
a21 a22 . . . . . a2n ← the n numbers of row 2 of A
.
.
.
an1 an2 . . . . . ann ← the n numbers of row n of A
```

The output format is shown next:

```
error ← the error of A*B
b11 b12 . . . . . b1n ← the n numbers of row 1 of B
b21 b22 . . . . . b2n ← the n numbers of row 2 of B
.
.
.
bn1 bn2 . . . . . bnn ← the n numbers of row n of B
```

The output format is the error (defined later) followed by the inverse matrix. See the test cases for the output examples.

Requirements & suggestions

a. To keep high precision, use the data type "double" to store each element. All intermediate variables should be declared as "double" too.
b. You can safely assume $0 < n < 201$.
c. You can safely assume the inverse matrix always exists. (So no exception handling for singular matrices is necessary.)
d. Your program should take the input from the standard input and send the output to the standard output. Therefore you can redirect input and output files if necessary, such as "myProgram < input.txt > output.txt".
e. The error in the output file is only for your own verification. Our judge system will compute the error based on the product of the original matrix and the computed inverse. The computed inverse is considered correct if the error is less than an error threshold of 1e-2. The error is defined as the maximum element of the absolute value of A*B-I, where I is an identity matrix of size n-by-n. (Check out the output of the test cases shown below.)
f. Please make sure your output should have at least 6 digits below the decimal point to keep precision. (When you print out your error, usually it is less than 1e-5. Our error tolerance is much higher since we need to read the inverse from your output file, which introduces extra error due to the difference between the internal double data type and its printed version.)
g. TAs will use 10 test cases (including the following ones) to test the accuracy of your program.