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Operations with matrices using c#

The resulting program is able to:

- Add — adding two matrices of the same size.

- Mult — multiplicating two matrices of the same size.

- Inverse — matrix inversre.

- Det — compute the determinant of a matrix.

For adding and multiplicating the algorithm is direct. The complexity of mult is O(n^3). There is also a Strassen algorithm with complexity O(n^2.8) which works better on big square matrices, but I decided not to use it.

Inverse:

For the matrix inverse, I used the adjugate matrix (also called the classical adjoint) and the cofactor matrix. There is a theorem which says:

A^(-1) = 1/det(A)*adj(A)

Testing data:

6 6 6

0 12 12

0 0 18

Result:

6 -3 0

0 3 -2

0 0 2

Determinant:

For finding the determinant I use a recursive algorithm, the complexity of which is O(n!). it finds determinants of smaller sizes (n-1, n-2, … up to 1) and use Laplace expansion.

Testing data:

2 4 6

2 4 4

3 3 7

Result: -12.

2 0 1

3 4 5

7 0 8

Result: 36.