

Programming Assignment #1 — due Tuesday, November 14

General description

For this assignment you are required to implement two algorithms for multiplying two square matrices: Strassen's algorithm (Section 31.2 of CLR) and the usual $O(n^3)$ matrix multiplication algorithm. Grading will be based on the correctness of your code (80%) and programming style (20%).

Input

The code you turn in should read *from the standard input* the matrix size, n , on a line by itself, followed by a blank line, followed by n lines each containing n integers separated by blanks (first matrix), followed by a blank line, followed by n more lines each containing n integers separated by blanks (second matrix). You may assume that n is a power of 2.

Sample input:

```
2
  
1 0
1 0
  
1 1
0 1
```

Output

For each algorithm your code should print *to the standard output* the result of multiplying the two input matrices (of course, the two results should be identical) and the running time *not including I/O time*.

Sample output corresponding to the above sample input:

```
O(n^3) matrix multiplication:
1 1
1 1
Time: 0.00 sec
  
Strassen's algorithm:
1 1
1 1
Time: 0.00 sec
```

Programming language

You may use C, C++, or Java for completing the project. Your code should compile and execute on acme. By default your code will be compiled using `gcc`. If your source code is spread over several files or you are using a compiler other than `gcc`, you must also submit the appropriate `make` file with your project.

Turn-in

E-mail your source code (attachments preferred) in a message with the subject "3500c project #1 submission" to `gte855t@prism.gatech.edu` by midnight, Tuesday, November 14. If your code consists of several files, send a single `tar` file containing all of them.