

# MA/CSSE 473 – Design and Analysis of Algorithms

## Trominoes Implementation Problem (100 Homework Points)

**Summer, 2016 Due Friday, June 24 at 11:55 PM**

**You may do this assignment alone or with a partner. See below.**

For any  $k \geq 1$ , if  $n = 2^k$  for some integer  $k$ , we examined two algorithms (one in the Johnsonbaugh reading, one in problems 6-7 of HW04) for using trominoes to tile an  $n \times n$  deficient grid with trominoes.

Implement both algorithms, including drawing the grid tiling using a graphics package. Your program should give the user a choice of algorithms. It should somehow indicate the order in which the trominoes are drawn by each recursive algorithm; for example, animation, numbering the drawn trominoes, or a color scheme.

Your implementations should be in a language (or combinations of languages) that I can easily (compile and) run and that supports drawing lines and other shapes that are necessary for your approach to drawing this).

Examples: Python 3 (submit your source files, including any non-standard libraries that you use)  
using TkInter, zellegraphics, rosegraphics, etc.

Java (submit an Eclipse project if you have multiple source files) using Swing or some other readily available graphics package

JavaScript (submit .html, .css, .js file, etc.) using HTML Canvas or some other graphics package,  
Maple using its plotting capability.

A version of scheme that includes graphics, such as [DrRacket](#).

If you want to use something else, please ask me in advance if it is okay.

The program should somehow (through console or GUI interface) ask the user for the value of  $k$ , the location of the “missing” square in the grid, and which of the two recursive approaches to tiling is to be used.

### **Submit it to the Trominoes drop box on Moodle**

You should submit a ZIP or RAR file containing your well-documented code to the Trominoes drop box on Moodle. If any special instructions are needed for running your code once I have unpacked it, please include those instructions in a README file. Please include your name(s) in the name of the ZIP or RAR file.

**If you wish, you may do this problem with another student from the summer 473 course.** If you do it together, only one of you should submit it, but include both students’ names in the name of your archive file.

**If you want to work with another student but do not know who to work with,** send me an email with subject line

473: Looking for Trominoes Partner

by the end of Wednesday, June 15. Include a list of languages in which you'd feel comfortable writing this simple recursive code that draws graphics. On June 16, I will send you this information for everyone who is looking for a partner, and you can then work it out.