

# MATH 199 PROJECT PROPOSAL

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## PROJECT OUTLINE

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### Week 2

Create a Ferrers diagram window in Qt that uses DeSalvo's integer partition library as the engine.

### Week 3

**Dot manipulations, part 1 (micro, individual dots).** Design a class around a Ferrers diagram that will allow the user to change the colors, locations, etc. of a default set of dots corresponding to an integer partition.

### Week 4

**Dot manipulations, part 2 (macro, collections of dots).** Apply the micro manipulations to collections of dots by defining iterators of an appropriate type and using algorithms from the STL.

### Week 5

**Dot manipulations, part 3 (connecting with Pak's paper).** Encode each of the geometric/arithmetic transformations contained in Pak's paper so that the procedures can be copied verbatim. Focus mainly on transformations that do not split or paste together multiple diagrams.

### Week 6

**Sequences of transformations.** Pick a couple of simple bijections between partitions, such as a fishhook or another even/odd bijection, and create a function that accepts as input a partition and outputs another partition after the appropriate transformations have been performed. The program will output each step of the transformation so that it can be tracked and understood.

### Week 7

Interface the application so that a partition can be input, or a random partition generated, etc.

### Week 8

**Very large random partitions and connections with limit shapes.** Start writing for a conference proceedings in applied computer science.

### Week 9

Prepare the work for a conference proceedings in a computer science/computational math conference, to be decided later.