Math 436 Project Requirements
Instructor: Jessica Striker

Goal. In groups of 2-3 students, learn *in depth* about a specific combinatorial collection along with its statistics and maps. Explain what you learn to both your classmates and the world. Perhaps you will even discover a previously unknown mathematical connection!

The Project will consist of two parts:

1. Contribute to the FindStat.org statistics database and wiki.
2. Give a 10-15 minute presentation during our final exam time May 16.

Process:

- Start-up:
  - Choose your group members and combinatorial collection.
  - Create individual accounts on the FindStat wiki.
  - Create a sagemathcloud project to play with the sage code for your combinatorial collection. Give all your group members (and me!) permission to access it.
  - Create a document where you can keep track of your personal contributions.
  - Make a plan for what each group member will work on.
  - Find at least 3 resources to help you learn about your combinatorial collection.
- Investigate:
  - Create a list of items missing from the *wiki* page for your combinatorial collection.
  - Research your combinatorial collection to find the missing information and to augment existing information.
  - Investigate the *statistics* on your combinatorial collection that are already in the FindStat database. See what you learn by running the statistics through the Statistics Finder. Experiment with the Sage code for these statistics.
  - Research to find new *statistics* to submit.
  - I will give you a list of the *maps* on your combinatorial collection that are currently implemented in FindStat. Experiment with the maps in Sage to find out what they do and/or research them.
  - *Research to find new *maps* to implement.
  - Keep a running list of interesting or unexpected mathematical facts you find. (You will use these in your presentation.)

- Contribute:
  - Edit the *wiki* with the information you've learned from your research.
  - Cite/link your resources properly on the *wiki* page.
  - List and explain interesting *statistics* on the wiki page. Make links from the wiki to the actual statistic page for all the statistics listed on the wiki.
  - Describe each *map* on your wiki page.
  - Edit existing *statistics* to insert further explanation and/or links to the OEIS.
  - Submit new *statistics*.
  - *Identify *maps* in Sage that are not in FindStat.
  - *Write code in Sage for new *maps*.
  - Email me about any bugs you find in FindStat (that you can't fix yourself).
- Report and present / Important Dates:
  - March 14-24: Tell me in class March 14 or 24 (or by email anytime in-between) your group members and first and second choices of combinatorial collection.
  - March 24: Project kick-off day in class.
  - April 2: Start-up report due. (Tell me, specifically, your group's progress on the above items. You should have completed all the tasks under 'Start-up'.)
  - April 23: Progress report due. (Tell me, specifically, your group's progress on the above items and what contributions each group member has made.)
  - May 5-9: During the last week of class, I will give you some class time to work on your presentation. (Ideas: Scroll through the wiki page, show off your statistics, show what the statistics finder finds when you run it on your statistics, show your links to the OEIS. You may also create additional slides for the presentation to explain the mathematics you learned.)
  - May 16: Present! Self and group evaluations due. Online contributions in their final form.
- Summer and beyond: You're an expert now; feel free to continue contributing cool combinatorics! Have a great summer!