

## Maths 2094: Research Project # 2

### Spring 2011

**Due Date:** 2:10 on Thursday, April 21st.

**Points:** This project is out of 10 points.

**Instructions:** You may work together on this project, although all members of a group should turn in their own projects. You may ask for minor assistance from any of the departmental or library faculty.

You must turn in your project at the beginning of class on April 21st, and it must be **typed in Latex**. Late projects will not be accepted. You must cite your work properly. If you are not sure of the proper citation, then please go to the library's web site (<http://lib.trinity.edu/lib2/cite.php>).

#### Project Problems:

1. Find the mathematical definition of *permutation* and the definitions for the following statistics on permutations: *descent number*, *inversion number*, *major index*, *excedance*.
2. Find the descent number, inversion number, major index, and excedance of the permutation  $\sigma = 51623847$ .
3. Find the names of the Ph.D. Thesis advisors for Drs. Cabral Balreira, Ryan Daileida, and Brian Miceli. Find and print the first page of an article written by Dr. Miceli's Ph.D. advisor (it's okay if there are other co-authors) about any of the permutation statistics listed in above. (Hint: Permutations tend to fall under the study of *Combinatorics*, a field for which there are many a quality online journal. All research needed to be done on advisors can probably be done from right in front of your computer.)
4. Make one suggestion as to what you would like to get out of a course like 2094. While this may not affect you at all, it can certainly help us make the class better for future generations of TU math majors.