

PROJECT GUIDELINES

CO 430/630, WINTER 2026

I am leaving open what form your final project should take (I hope some of you will take me up on unusual project formats and maybe we'll have a play or a dance or ?) I have, in the past, had projects including, a board game, a historical essay, and a lesson plan for high school level.

Your project will have two parts (1) the project itself, whatever it is, and (2) a short presentation in class about it.

Regarding part 1, I expect that most people will do a written project. If so, it should typically be 6-10 pages in length. If you do something else, then it will take whatever form it naturally takes. If it is unclear what that should mean in your case, **come talk to me in advance**. Whatever it is, it is due on **Monday April 6** at 4pm by email to me kayeats@uwaterloo.ca unless a different form of submission was pre-arranged with me.

Regarding part 2, everyone will give a 10-15 minute presentation in class time at some point during the last three weeks of class on what you did for your project so that everyone else in class will know something about it. If your project intrinsically requires a longer presentation please talk to me in advance.

Here are a few ideas for project topics.

- Expand on a concept mentioned briefly in class. Some that could work that came up include
 - Combinatorial use of formal Puiseux series
 - Prüfer encoding and Cayley's theorem for the number of labelled rooted trees
 - Isomorphism between the ring of formal Dirichlet series and the ring of formal power series in infinitely many variables, and what comes of it.
 - Poset counting things, see for instance chapter 3.15 of Stanley's Enumerative Combinatorics.
- Discuss the background and motivation to an open problem related to the class material.
- Do an interesting computation of some things discussed in class.
- Read a relevant research paper, explain the core idea and work out a detailed, insightful example.

The project should be at a level that your fellow classmates could understand and appreciate it.

The project will be graded on

- clarity and presentation: Is it clear and understandable? Does it tell a story in a compelling way?
- mathematical content and correctness: Is the mathematics in the project correct? Is it relevant to class and to the project topic? Is the mathematics insightful?

There are many ways to do a good project, so there is no rigid grading scheme.

Cite your sources and **don't copy**. You can get a 0 or worse for academic dishonesty.