Final Project Proposal (due 3/3)

DS-563 / CS-543 @ Boston University

Spring 2023

General information

Each project can involve 1–3 students. Larger groups are expected to propose more challenging projects that may involve more work.

Any project should be a result of independent investigation and in particular, there should be a clear distinction between what has already been known and what this project aims to achieve. This does not rule out projects that, for instance, attempt to reproduce experimental results of another work.

Reusing any work developed or being developed for another class is not allowed without an approval from the instructor.

Possible Types of Final Projects

Various types of final projects are allowed. Here we specify a few basic types of possible projects. Some projects could span more than one category or could aim for one category but use another one as a fallback if the problem turns out too challenging.

- **Original research:** This could include proving a new upper or lower bound, proposing a new problem and investigating its complexity, simplifying an algorithm or lower bound, or showing a new way to solve a problem.

- **Implementation:** Implement a known non-trivial algorithm or class of algorithms and make it publicly available on GitHub or elsewhere. (You may want to specify the license you will use.) This could also involve implementing heuristics that will make the implementation more efficient in typical cases.

- **Experimental:** Implement one or more algorithms and ask interesting questions about its properties. This could involve attempting to reproduce experimental results of another work. See Programming Assignment 1, in which we ask several questions about CountMin Sketch, for inspiration.

- **Reading:** This type of project will involve reading one or more papers. Possible projects here include writing a survey on a specific problem and discussing different techniques that can be used to approach it, or understanding a not–so–easy–to–read paper and writing a simpler exposition that perhaps includes suboptimal bounds but explains the crucial techniques in a more approachable way.

Other types of projects are possible as well. You are invited to discuss your project idea, whatever it is, with the instructor ahead of the project proposal deadline.

Content

There is no prescribed minimum or maximum number of words to be used, but please be more specific than "We'll implement a few algorithms." Apart from clearly specifying the desired content of the final project, topics you may want to discuss include:

- Why do you find this project interesting?

- What is already known about the problem?

- How is what you are doing different from what was previously achieved?

- What tools are you going to use?

- If the project involves more than one person, how are you going to collaborate? Are you going to have regular meetings? How will you partition the work required to finish the project?

Submitting

Please submit a project proposal via Gradescope (entry code: 4VYBJ6) as a PDF. For project proposals involving more than one person, it suffices that only one project member submits the proposal.

Feedback

We will schedule meetings of all groups with the instructor to discuss the project proposals.

Final Project Presentations and Reports

The last week of classes will feature final project presentations. The length and timing will depend on the number of projects. Final project reports are due on 5/9.