6.1800 DP Final Report Assignment, Spring 2025

Due: May 5, 2025; 11:59pm
Length: 6000 words[1]
Submit: On Canvas

Having now had two rounds of feedback on your design, it's time to write your final report. Unlike the proposal document, the report should contain enough detail that it could feasibly be turned over to NASA for implementation. It should also contain an evaluation of your design.

Late policy: Like all assignments in 6.1800, if you reach out to your TA in advance of the deadline, we will give your team a 24-hour extension, no questions asked. Beyond that, if you submit late, we will penalize you one letter grade per 48 hours, starting from the time of the deadline.

Outline of the Report

Your team's report should be approximately 6000 words and follow the basic outline below:

- **Title page:** Give your report a title that reflects the subject and scope of your project. Include your names, email addresses, the name of your recitation instructor, and the date on the title page.

- **Introduction:** Summarize the problem to be solved, what your design is intended to achieve, and who is most impacted by your system. When summarizing the problem, you should extrapolate and highlight the technical challenges that make this issue a hard systems problem from the design description. Outline your design and briefly outline why your design meets the requirements.

- **System Overview:** Provide a high-level description of your system's modules, behaviors, and innovating techniques or strategies. This should include an updated system diagram and **serve to introduce definitions for key terms** used in the Design section. The system overview also provides an opportunity to prioritize the main system objective(s).

- **Design:** Explain your design. Identify your design's main components and workflows. You should sub-divide the design, with corresponding subsections in the text, so that the reader can focus on and understand one piece at a time. Explain why your design makes sense as well as explaining how it works. Use diagrams, pseudo-code, and

[1] We often get questions about how strict the word count is. It is fine to be within +/- 10% of the given word count. If you are more than 10% over, your recitation instructors will not read your full report (i.e., they will stop reading after ~6600 words). If you are having trouble staying within the word limit, please reach out to your WRAP instructor for advice.

worked examples as appropriate. It should be clear from this section that your design meets the specifications of the assignment (e.g., that it does not exceed the storage capacity of any hardware, the capacity of the network, etc.). Leave any major calculations to the evaluation section, though it's fine to reference those calculations beforehand (e.g., "Our design results in a communication overhead of fewer than 1Kbit/sec; see Section 3.1 for an analysis.").

- **Evaluation:** Evaluate your design. There are more details about this section below.

- **Conclusion:** Briefly summarize your design, highlighting the novelty or specific focus of your system, and provide recommendations for further actions and a list of any problems that must be resolved before the design can be implemented.

- **Author contributions:** A brief statement (typically 1-3 sentences long) describing the contributions of each author. These contributions could include designing specific components of the system, research or investigation related to the design problem, qualitative or quantitative evaluation, writing the text of the report, editing the report, creating figures, etc.

- **Acknowledgments and references:** Give credit to individuals whom you consulted in developing your design. Provide a list of references if appropriate.

- **Appendix:** You may *optionally* include an appendix, but this should include material in excess of what may be needed to understand your design. Your recitation instructor may read the appendix only briefly or not at all at their discretion.

Evaluation

A good evaluation will do more than just calculate metrics relevant to your system; it will also use calculations to justify design decisions. For example, "Our method for transmitting data to Earth results in an average latency of two minutes, compared to a design without this method, which results in an average latency of ten minutes."

At a minimum, your evaluation section should address the following questions:

- What is the communication overhead of your system? What does your system gain from any additional communication that you added? That additional communication might be administrative overhead, it might be duplication of certain messages, etc.

- How long do various operations take on average? In the worst case? These operations could include the latency of getting a piece of data to a particular place, the amount of time it takes to locate a piece of data on local storage, etc.

- What parts of your system limit scale, and what are those limits? E.g., could your system handle the addition of more users? Of more data?

Throughout, it's likely that you will justify some of your design decisions based on how it impacts certain groups (e.g., "We made decision X as opposed to Y because Y had a negative impact on a certain group of people").

Additionally, we'd like you to address the following questions

- What group(s) of people did you have in mind as you designed your system? How did that shape your decisions?
- How does your system impact the following groups: astronauts on the Moon, citizens of Kyrgyzstan, and scientists using the telemetry data? Are there places where these groups are prioritized in your system? *De*-prioritized?

You should include this discussion in your Evaluation section if it does not come up earlier in your report.