AI Project 3: AI Use in Teaching Transport

Due: 10/14/25

Overview

Artificial Intelligence (AI) is increasingly useful not only for solving transport problems, but also as a tool for studying and consolidating concepts. This project is designed to help you prepare for the upcoming midterm (10/16) while developing skills in AI-assisted problem solving, technical writing in LaTeX, and oral presentation.

Assignment

You are asked to use AI to study and analyze the Spring 2021 midterm (posted on the class website). For each problem on that exam:

1. **Restatement of Problem:** Have AI provide a concise restatement of the problem being solved.
2. **AI Solution in LaTeX:** Use AI to prepare a LaTeX-formatted solution to the problem. Edit the AI output as needed for clarity, correctness, and formatting.
3. **Study Guide:** Provide a short study guide for the concepts behind the problem. This should include:
   - 2–3 key concepts students must master to solve the problem.
   - References to BSL (sections/examples), identify which class lecture is most applicable to the problem (provide url), and identify a reputable related web source with verified url.
   - At least one additional practice problem or variation (state the problem, do not solve it).
4. **Screen Recording.** Create a narrated screen recording (similar to recorded lectures). In your recording:
   - Explain the solution to each problem.
   - Highlight the conceptual analysis and study guide elements.
   - Emphasize your reasoning, not just reading the AI-generated text.

   Upload the recording to Panopto and insert the link(s) into both your LaTeX source and PDF.
5. **AI Interaction Notes.** Include in an appendix selected excerpts of your AI prompts and responses, especially where you had to refine or correct the output. Briefly explain any corrections or adjustments you made.

Deliverables

- A compiled PDF report containing:
  a. A restatement of each problem.
  b. Solutions in LaTeX for each problem.
  c. Concept analysis and study guide for each problem.
  d. Panopto link(s) to your screen recording.
  e. Appendix with AI interaction notes.
- Your Panopto recording uploaded and linked into the PDF.

Guidelines

- Keep your total recording time under 30 minutes. Aim for about 5–7 minutes per problem.
- It is useful (and faster!) to do these problems one at a time with separate files and recordings for each. The links to the recordings need to be added into the LaTeX after the recordings are generated. The individual LaTeX files should be combined (e.g., cut and paste with a single preamble and end of document command) to yield a single PDF at the end, with a single appendix discussing AI interactions.
- Remember: the midterm will be closed-book and closed-AI. The purpose of this project is to use AI as a learning partner now, so you are prepared to work independently on the exam.
- Professionalism in both your LaTeX write-up and recorded presentation will be part of the evaluation.

Rubric

Your grade will be based on the following criteria:

1. **Accuracy of Solutions (30%)** Correctness of the LaTeX-formatted solutions and appropriateness of any edits to AI output.
2. **Depth of Conceptual Analysis (15%)** Clarity in identifying the key transport phenomena concepts each problem is testing.
3. **Usefulness of Study Guide (15%)** Quality of references, clarity of explanations, and inclusion of at least one meaningful practice problem per question.
4. **Clarity and Professionalism of LaTeX Write-Up (10%)** Organization, readability, formatting, and integration of links.
5. **AI Interaction (10%)** Approach to using AI well described.
6. **Quality of Recorded Presentation (20%)** Effectiveness of narration and clarity of reasoning.