CE 422: Finite Element Analysis Project #1

Using any Commercial FEA software (e.g., ANSYS, ABAQUS, SAP2000, etc), compute the deflection of a 2D truss system subjected to a static loading.

Problem 1A: Determinate System

- Select a 2D truss system that is determinate
- Select boundary conditions such that your structural system is stable.
- Subject your truss system to a static loading, with discrete loads applied at specific joints.
- Your structural system should have no less than 20 truss members.
- Using your FEA software of choice, evaluate the truss system's deflections, stresses, and reaction forces.
- Verify the computed analysis values with hand calcs.

Problem 1B: Indeterminate System

- Introduce additional boundary conditions to render your structural system indeterminate.
- Using the FEA software of choice, re-evaluate the truss system's deflections, stresses, and reaction forces.

Analysis Report

Summarize your study in a brief report that includes the following:

- Problem description
- Modeling considerations
- Hand calcs used to verify the determinate structure
- Discussion of displacement results and observations
    - Graphical portrayal of results
    - Comparison of the computed results w.r.t. hand-calc solution
- Appendix
    - Input data for both Problem 1A and Problem 1B analyses
    - Output data for both Problem 1A and Problem 1B analyses

Project Deadline

- October 26, 2021

October 12, 2021