This project explores three methods for solving BVP problems of the type:

\[ x'' = f(t, x, x'), \quad x(a) = \alpha, \quad x(b) = \beta \]

The three methods are 1) Shooting Method, 2) Finite Differences, and 3) Galerkin’s Method. The goal is to write a report that compares and contrasts the three methods from the perspective of accuracy, stability, implementation, computer times, and the circumstances when one method may be better than the others. You should focus on at least one nonlinear problem to base your conclusions such as the large angle pendulum or \( x'' = -(x')^2, \quad x(0) = 0, \quad x(1) = 1 \) explored in lectures. In your conclusions, address each method’s handling of nonlinear difficult problems. If you were to implement a robust program to handle these problems using your preferred method, list some of the key implementation steps needed to develop an efficient program which perhaps you did inefficiently for this project.

**Project 2 Report Scoring Rubric**

- Report quality: Introduction, Body, Conclusion/Summary
- Addresses all that is asked
- Quality of Comparison
- Stability discussion
- Difficulty with Nonlinear problems
- Implementation guidance from project’s implementation
- Creativity in any of the above