CS 374

ID: 201801015

Individual contribution:

- Section 3: Analysis of Double Pendulum: 201801015
- Section 4: Lagrange Interpolation: 201801015
- Section 5: Numerical Integration
    - Part 1: 201801015
- Section 6: Solution to Ordinary Differential Equations
    - Part 2: 201801015

What have I learnt through this project and course?

This course provided me with deep insights regarding the working of various numeric techniques and models. Some of them are often used quite frequently, but the reasoning was hitherto unknown to me. Hence it embeds me with a solid understanding of the working of a lot of mathematical models and the techniques and thought process behind them. The growth in computing power has revolutionized the use of realistic mathematical models in science and engineering, and subtle numerical analysis is required to implement these detailed models of the world. Moreover, these concepts have scope much beyond the course boundary and the standard mathematical regime. Numerical methods are used in space missions and market analysis and it is always computationally efficient to know optimal algorithms to solve the desired equations. Matrices and differentials show up everywhere while solving real world problem and now we have efficient algorithms to tackle such problems with considerate accuracy. Techniques like interpolation are actively used in Economics to draw extension to existing curves. This incidentally helped me in my HM -106 (Economics) course. The various algorithms taught in the course can be very useful for IT students. Furthermore, the project was unique in its own approach and helped me explore a lot of concepts. Since our project had components from chaos theory and vandermonde matrices we had to shuffle through a lot of research papers to build a solid understanding. Hence although these weren't in the purview of the course but this course provided motivation to go above and beyond to understand certain topics. We are also looking forward to use these concepts learned in other courses like Machine Learning, Optimization, Computer Graphics, etc. Overall, the thrill of designing and analysis techniques to give approximate but accurate solutions to hard problems and the entire mathematics behind it will always have a special place in by brain.