

# SolarSym - Solar System Simulator

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# 1 Introduction

A program for computing the best possible initial time, place and velocity for a launch of an object from one stellar object to the other in a solar system. The program works using Newton's mechanics.

## 1.1 Features

1. Computing the launch time, place and velocity due to the data given(start and end object, time interval of the search and if the object is a rocket or not, if is a rocket then mass of the rocket with and without fuel),
2. Can output a 3D plot of the trajectory,
3. Can also output a fitted curve for the trajectory.

## 2 Tasks breakdown

1. Model the physics for the simple object simulation,
2. Learn the numerical methods required,
3. Implement the methods,
4. Design and develop the brute force algorithm for the search; i.e. minimization of the results of the integrators for least *energy usage* and *time duration* of trajectory,
5. Implement the algorithm,
6. Design and implement the inputs,
7. Design the outputs,
8. Design and implement the *real time Solar system planet data* from databases,
9. Implement the output of launch data,
10. Test the program with live data,
11. Implement the output of the fitted curve of the trajectory,
12. Implement the output of the 3D plot of the trajectory,
13. Test all outputs.

*NOTE: each task also includes minor testing and fixing*