Our program starts with the initial conditions and parameters that were presented within the project.

The equations of motion were implemented into a function to integrate the current state of the system and return its derivatives.

An optimization function was created to simulate via ODE45 whether the spacecraft made it back to Earth, crashed, or did not return.

Another function was created for the sole purpose of determining this outcome.

A grid search was performed to this optimization function to roughly narrow down the delta\_V required.

The fminsearch MATLAB function was then used on this closer estimate to find a precise delta\_V that results in the spacecraft returning to Earth.

This delta\_V was implemented in one last ODE45 call to model the result where the spacecraft returns with the minimum delta\_V required.