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## Robust future interplanetary mission planning

Future mission planning requires years of planning in advance. Preliminary mission design must be evaluated years before the mission launches. A generic robust program was developed to solve Kepler's Problem via Gauss' Solution using universal variables. The program was developed to be general and allow for more celestial objects, other than the nine planets, to be added to the ephemeris. The file developed can analyze C3, launch  $\Delta V$ , arrival  $\Delta V$ , or total mission  $\Delta V$ . The Gauss' Solution is generic enough analyze missions independent of the launch or arrival body. The program developed only evaluates type 1 and 2 orbits, however analysis could be continued to include type 3 or 4 orbits, or planetary fly-by gravity assists.