You are making observations of a comet in space to figure out if it is on a collision course with the Earth. For this you need to estimate as accurately as possible the trajectory of the comet. Your observations consist of coordinates x and y of the comet relative to the Sun at angles α measured with respect to a fixed point centrally located inside the orbit (this information is not normally available, but it might make the solution to this assignment easier). The measurements have errors which you don't know, but you have a way to estimate the measurement uncertainties. The problem is 2D, i.e. the comet, the Earth and all other planets are in the same plane.

Find the comet trajectory using INVERSION[1].

Please attach all the programs you wrote for this assignment.

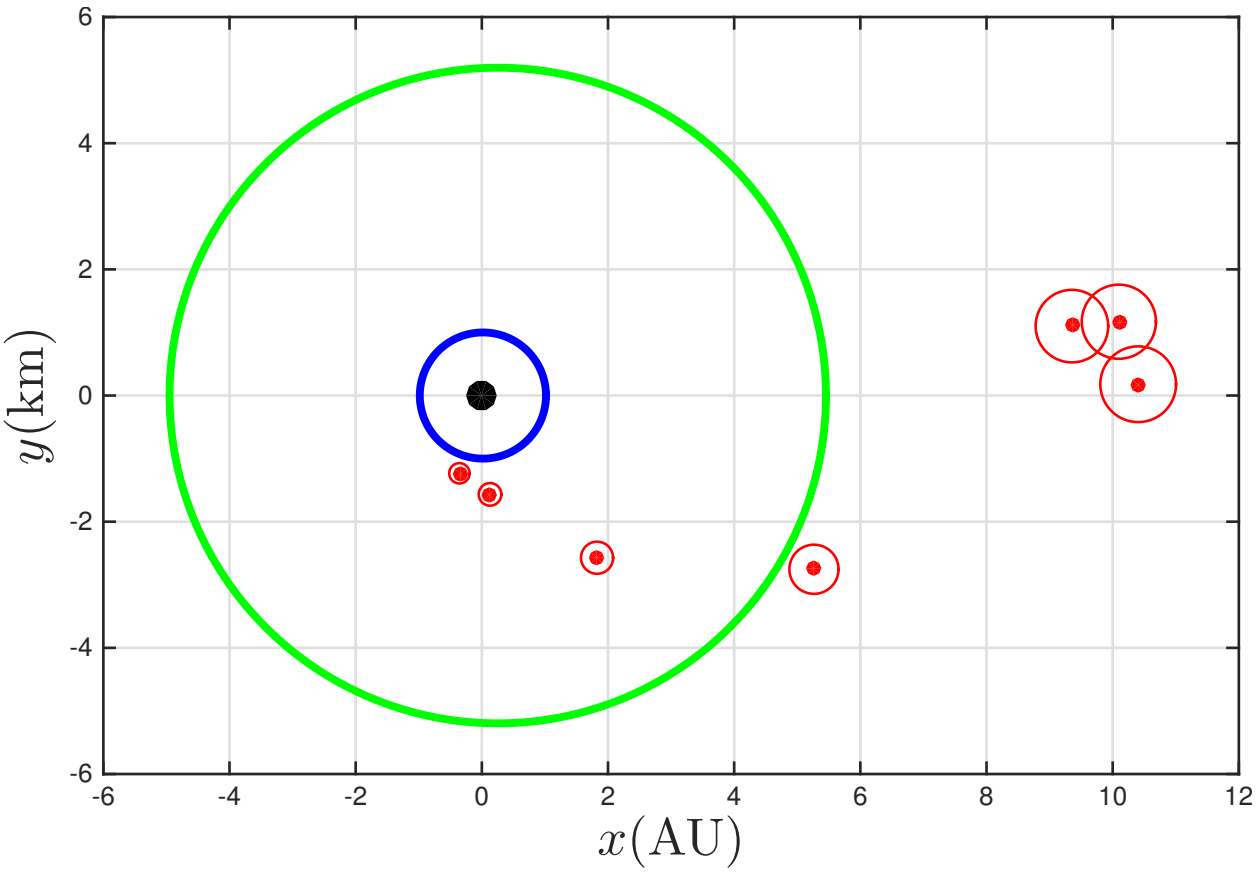

Figure 1: Measurement of the comet position with associated uncertainty, relative to the Sun (black dot), the Earth orbit (blue line) and the Jupiter orbit (green line).

N.B. This is an individual assignment – your work is subject to the Mines Student Honor Code.

[1] Hint: Google "parametric equations".

x (AU)	y (AU)	a (deg)	s (AU)
10.0979	1.1700	19.0529	0.5874
9.3538	1.1003	27.0752	0.5749
−0.3553	−1.2328	204.5682	0.1613
0.1299	−1.5668	213.5933	0.1789
1.8263	−2.5716	239.6657	0.2543
5.2648	−2.7542	274.7632	0.3894
10.4042	0.1793	358.9972	0.6000