CE 506 Homework 4
Assigned Tuesday 12 October, due Tuesday 19 October

1. We observe a 3D range from each of 4 control stations, A,B,C, and D, to an unknown point, E. The point coordinates and the observations are shown in the table.

Point	X	Y	Z		From	To	Dist	Sigma
A	22.369	95.588	1.725		A	E	42.177	0.02
B	92.254	102.717	1.736		B	E	44.534	0.02
C	62.705	15.849	1.587		C	E	63.491	0.02
D	42.039	39.771	1.652		D	E	43.355	0.02
E (approx)	60	75	14					

Use the least squares method of indirect observations, and nonlinear techniques, to determine the estimate of point E.

2. Horizontal distances are observed in a 2D network. There are 13 points and 27 observed distances. Load the file *hw4_2.mat* from the \\geomatics drive or from ftp.ecn . That file has coordinates of 13 points (hold 2 & 12 fixed as control, others are approximate) and 27 distance observations. Use a sigma of 0.007 for all observed distances. Use nonlinear least squares, indirect observations, to adjust the network. Make sure that you use your program to assign all of the elements of the B-matrix and the f-vector. Do not hand-craft a solution here, that is an important aspect of the assignment.