CE 506 Homework #9
Network Adjustment with GUI
Due: last day of class (6 December)

Design a MATLAB GUI and associated adjustment code to perform a least squares adjustment (by indirect observations) of an arbitrary horizontal (2D) network (i.e. traverse, triangulation, trilateration, or any combination).

Take input from 2 files (your program will query the user for 2 filenames):

Point file, ASCII text with format:

Point number, X, Y, control flag
- Do not assume that point numbers are sequential or in any numerical order
- X,Y are initial approximations or control values as appropriate
- Control flag: 1=known control point, 0=unknown point
- Note: you will have to map point number to parameter index

Observation file, ASCII text with format:

Obs. Type, I, J, K, observation value1, value2, value3
- Obs. Type: (minimum set) D, A, Z (distance, angle, azimuth)
- I, J, K: point numbers of "at", "from", "to" stations (K=0 for distance)
- Observation value: d,m,s for angle, etc, dist, 0, 0 for distance

Specify a priori sigmas in a dialogue box
Detect inconsistent point numbering and complain to operator
Make a network plot
(The following should be displayed as a listing and sent to a log file)
Display iterations and convergence info
Show final adjusted point coordinates
Show adjusted observations
Show residuals
Show n, n0, r

Optional items (for ambitious students):

Implement a design mode (no observation values)
Allow an option for a direction observation (code=R)
Show post adjustment statistics: global test, standard deviations of parameters, confidence ellipses at points, user input for ellipse scale
Allow alpha characters in the point name

Submit your code, it will be evaluated by running against one or two sets of network files that we generate.