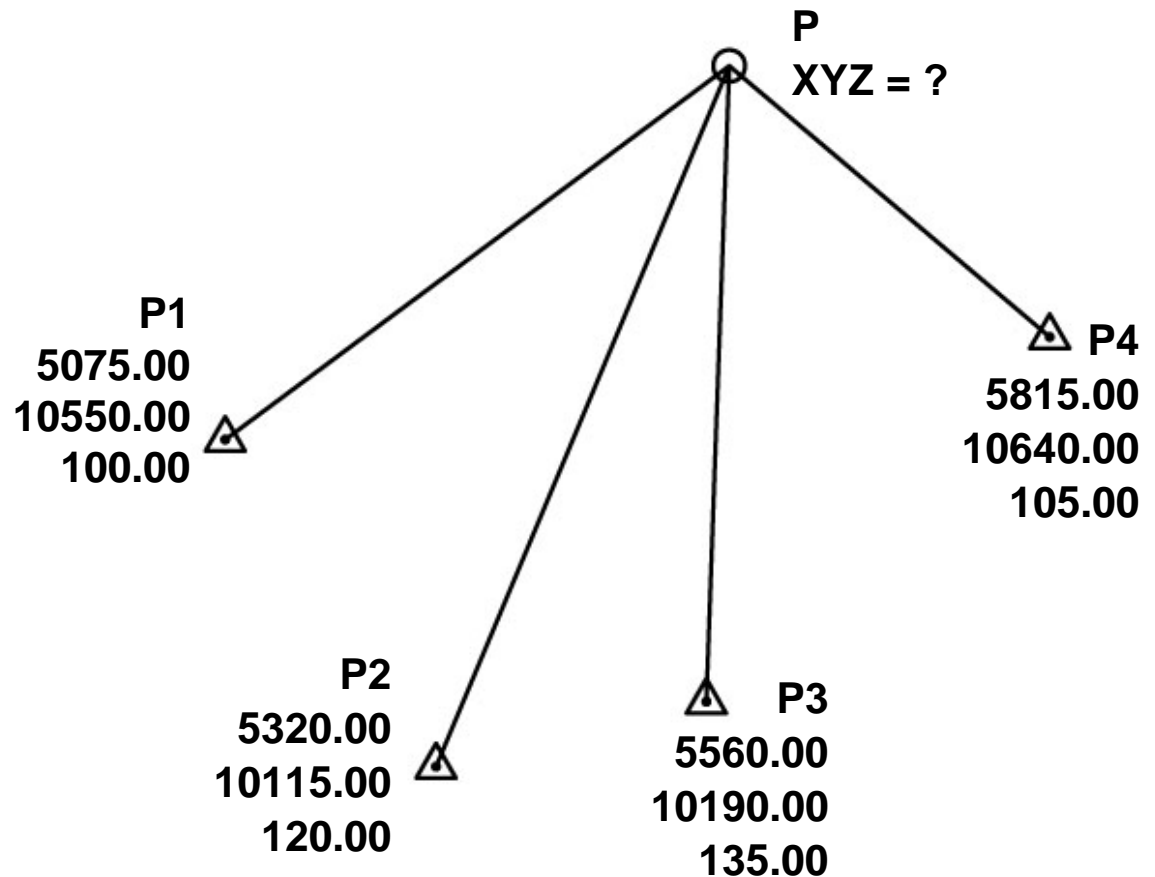


CE 597Z Homework 2
 Assigned Wed. 26 Sept. 07
 Due Thur. 4 Oct.

1. In the accompanying table, d_i corresponds to the 3D range observation between fixed control point P_i and unknown point P . Also given are *a priori* sigmas for each observation. Using the method of indirect observations, obtain the least squares estimate of the coordinates of point P .

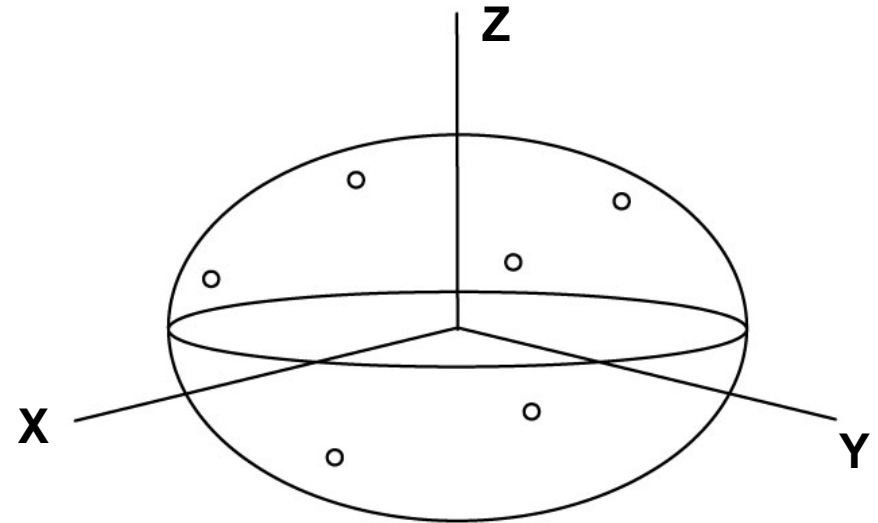
i	d	sigma
1	698.00	0.40
2	628.40	0.40
3	483.05	0.05
4	430.30	0.40



2. Six points are observed in all three coordinates, with the given sigma describing each of the x,y, and z components. Fit a rotational ellipsoid to these data points using the method of general least squares, or the mixed model. The equation representing the ellipsoid is as follows,

$$\frac{x^2 + y^2}{a^2} + \frac{z^2}{b^2} = 1$$

For initial approximations, use the dimensions of WGS84



pnt	X (km)	Y (km)	Z (km)	Sigma (km)
1	4600.00	2200.00	3818.70	0.020
2	1000.00	1000.00	-6198.50	0.020
3	-3200.00	3400.00	4330.60	0.020
4	-2100.00	-2500.00	5460.75	0.020
5	-2700.00	-5000.00	-2886.95	0.002
6	200.00	-500.00	-6334.05	0.020

General comments:

- Solve the iterative problem using Matlab
- Turn in all source code, annotated listing of numerical output
- For first iteration only show all relevant matrices, subsequent iterations show only information about convergence
- For each problem make a cover sheet with analysis of problem and executive summary of solution
- Comments in code are helpful for me and you, variable names that convey clear meaning are helpful
- Implementing algorithms in code is part of the assignment, collaboration and examination of existing codes are fine, but ultimately you make and are responsible for your own code.
- On assignment like this one, waiting until the night before it is due to start is a bad strategy
- When convergence achieved, show the residuals, and the adjusted observations
- Note or comment on anything about the problem or the results that seems worthy
- Use “format compact” to reduce pages of output, make sure enough digits are displayed to evaluate the results