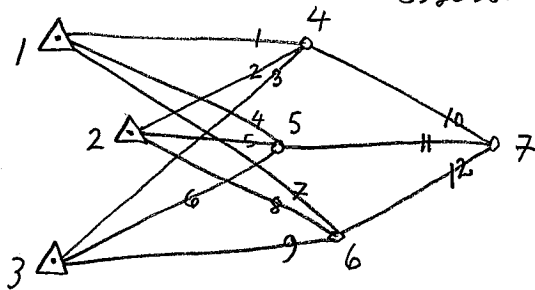


# Adj. of Geospatial Obs. Homework 8

assigned monday 5, Nov. due monday 12, Nov.

1. Estimate the unknown point coordinates by least squares. Make 2 sided global test at  $\alpha = 0.05$ . Plot 99% confidence ellipses for all of the unknown points (overlayed on network plot).



observations are 2D distances with  $\sigma = 0.03$

	X	Y
1	10.000	50.000
2	15.000	25.000
3	10.000	10.000

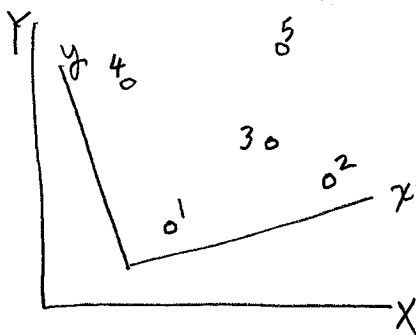
Control points

d1	37.074	d7	49.519
d2	39.372	d8	31.614
d3	53.059	d9	35.364
d4	36.104	d10	26.396
d5	25.510	d11	30.440
d6	36.087	d12	31.981

2. Estimate the parameters of the model:
- $$x = a_0 + a_1 X + a_2 Y$$
- $$y = b_0 + b_1 X + b_2 Y$$

Both  $x, y$  and  $X, Y$  are observed.  $\sigma_x, \sigma_y = 0.4$ ,  $\sigma_X, \sigma_Y = 0.2$

make a 2-sided global test at  $\alpha = 0.05$ . Compute the physical parameters from the  $a$ 's &  $b$ 's.



	X	Y	x	y
1	30.06	20.06	12.51	5.35
2	59.83	29.99	45.99	5.77
3	49.97	40.12	38.69	17.54
4	20.22	50.22	11.93	36.50
5	49.83	60.01	44.57	35.43

For nonlinear homework problems, be sure to show initial approximations, and all matrices for the first iteration. Of course show all of the other relevant items:  $n, n_0, r$ , which method you use, parameters, sample condition equations, estimated parameters, residuals, ... etc.