CE597 Adj. Geospa. Obs. Homework 1

assigned Tues. 27 Aug, due Tues. 3 Sept.

1. For the given data, y = observation, x = constant, y_i equal precision & uncorrelated, fit a line of the form $y = mx + b$ by least squares, using the "hand computation" approach. (You may solve the normal equations with matlab or equivalent.)

x	y
1	3.50
4	4.50
7	5.70
9	6.80

Show the residuals (always!) and the adjusted observations, and the parameter estimates.

2. Solve the same problem by "searching" using scaled parameters. $y = \frac{a}{125}x + \frac{b}{25}$. Test values of a: 25 ... 75, and values for b: 50 ... 100. For each value of a & b compute $V_i = \hat{y}_i - y_i = \frac{a}{125}x_i + \frac{b}{25} - y_i$, then $\Phi = \sum v_i^2$. Find a, b giving minimum Φ. Show contour plot of Φ. [This is integer LS]

3. Repeat 2, for the L_1 objective function

$$\Phi = \sum |v_i|$$