Adj. of Geospatial Obs.

Homework 1, assigned Monday 20 August 2012
due " 27 " "

Matlab Practice & Statistics Warm-Up

1. generate 1000 "random" samples, normal, mean 0, standard deviation 1, for X_1, X_2, X_3
   make 2 scatterplots of (X_1, X_2) and (X_2, X_3)
2. generate $Y_1 = X_1 + X_2$, $Y_2 = X_3 + X_2$, $Y_3 = X_3 - X_2$
   make 2 scatter plots of (Y_1, Y_2) and (Y_1, Y_3)
3. compute sample <u>covariance</u> matrices & <u>correlation</u> matrices for (X_1, X_2) , (X_2, X_3) , (Y_1, Y_2) , (Y_1, Y_3)

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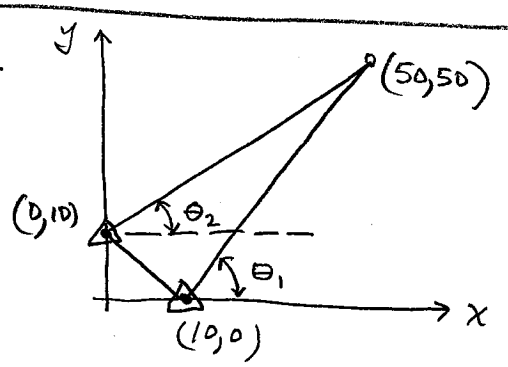
4. compute nominal values for Θ_1, Θ_2 from sketch.



5. generate 1000 "random" samples, normal, mean 0, standard deviation = $10'' \cdot \left(\frac{1}{60}\right)\left(\frac{1}{60}\right)\left(\frac{1}{57.29\ldots}\right)$ for $\Delta\Theta_1, \Delta\Theta_2$
6. for all 1000 pairs, perturb angles $\Theta_1 + \Delta\Theta_1$, $\Theta_2 + \Delta\Theta_2$, compute slopes of 2 lines, compute intersection point
7. Save 1000 intersection points in X, Y arrays
8. make scatterplot, compute sample <u>covariance</u> matrix, and correlation matrix.

→ Comment on anything interesting that you see. ←

useful matlab commands


```
R = random('norm', μ, σ, [10,1]) ;
cov_mat = cov([x Y]) ;   assume X & Y are column vectors
corr_mat = corr([x y]) ;      "   "
plot(X, Y, 'R*') ;
axis equal
diary filename.lst
  :
diary off
format compact, format long g , format short g
title('Title for Current Plot') ;
figure      = open a new figure
%  = comment, following this symbol, text is ignored
     EXCEPT in fprintf format specifiers !
rho = 180/pi      (57.29...)   degrees per radian
X = zeros(1000,1) ;
Y = zeros(1000,1) ;   } column vectors !
for i = 1:1000
    X(i) = ...
    Y(i) = ...
    end
```