You do not have to type your problem sets. But please PRINT neatly, on a single-side of paper with no jagged edges.

Be sure to explain all your answers, and clearly indicate what values from your estimates lead to your answers.

Data: http://www.nyu.edu/classes/nagler/quant2/data/mcolin11.asc
Data: http://www.nyu.edu/classes/nagler/quant2/data/omit1.asc

Load the file mcolin11.asc. It contains the variables y1, x1, x2, x3, x4, and x5 (in that order). Your theory suggests that y1 is a linear function of x1 thru x5. Estimate a model of y1 as a function of x1 thru x5.

1) Do you think there is multicollinearity present? If so, why? Present any relevant evidence.

2) Are you 95% confident that x1 has an effect on y? Are you 95% confident that x2 has an effect on y? Present any relevant evidence.

3) Perform the appropriate test to see if x1, x2, x3, and x4 are jointly significant at the 99% confidence level. Describe very precisely all the steps and calculations involved in the test. Be sure to state the null and research hypotheses involved. State very clearly what you conclude.

For the following use the dataset omit1.asc, which contains y, x1, and x2.

You believe the following is the true model:

\[ Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \epsilon_i \]  

(1)

4) What are your best estimates of the parameters of the true model? Are you 95% sure that X1 affects Y? X2?

5) Say you were not able to get data on X2. Estimate the model with X2 omitted:

\[ Y_i = \beta_{20} + \beta_{20} X_{1i} + \omega_i \]  

(2)

6) Give an expression for the expected value of \( \hat{\beta}_{20} \).

7) Can you demonstrate that your expression in (6) explains the results from OLS estimation of equation (2)? [To do this, you need to estimate model (2) with OLS, report those results, and explain.]