STA 302/1001 Summer 2001 Assignment 3

Quiz on June 6th. Do this assignment in preparation for the quiz. Bring a calculator. Bring printouts of the log and list files to the quiz.

1. Use SAS `proc reg` to do problems 1.21, 2.6 (a, b, c and d but not e), 2.15 (a, b and c but not d), and 2.25. You will have to type in a very short raw data file based on the data in 1.21. Bring printouts of the log and list files to the quiz. Your will be asked questions based on the printouts, and you *may* be asked to hand one or both of them in. **Do not write anything on the log or list file printout exept your name and student number**.

2. Read Chapter 5. Do problems 5.3, 5.4, 5.17 and 5.18. For 5.17 and 5.18, assume that the Y_i random variables are independent, with $E(Y_i) = \mu_i$, and $\sigma^2\{Y_i\} = \sigma_i^2$. I have no idea if this is the assumption the authors make in the solution manual.

3. Let $\mathbf{X}$ be a $p \times 1$ random vector. State the definitions of $E(\mathbf{X})$ and $\boldsymbol{\sigma}^2\{\mathbf{X}\}$.

4. If the $p \times 1$ random vector $\mathbf{X}$ has mean $\boldsymbol{\mu}$ and variance-covariance matrix $\boldsymbol{\Sigma}$, show $\boldsymbol{\Sigma} = E(\mathbf{X}\mathbf{X}') - \boldsymbol{\mu}\boldsymbol{\mu}'$.

5. If the $p \times 1$ random vector $\mathbf{X}$ has variance-covariance matrix $\boldsymbol{\Sigma}$ and $\mathbf{A}$ is an $m \times p$ matrix of constants, prove that the variance-covariance matrix of $\mathbf{AX}$ is $\mathbf{A}\boldsymbol{\Sigma}\mathbf{A}'$.