36-401 Homework #7 Due November 29, 2001

1. Refer to the dataset and problem outlined at http://lib.stat.cmu.edu/DASL/Datafiles/ICU.html. Download the data and use S-plus to:

   (a) Perform a logit regression of vital status on the following predictors: AGE, SER, CRN, INF, CPR, SYS, TYP, PO2, CRE, LOC. Which predictors appear significant?

   (b) Compare your results from (a) with the smaller model considering AGE, SYS, TYP, LOC. Are these predictors significant? How does this model compare with the model in part (a)?

   (c) From part (b), perform a final logit regression using only the predictors that were found to be significant in part (b). Interpret these coefficients.

   (d) Use the model in part (c) to determine the survival probability (denote this as $\hat{P}$) of a patient who is an emergency admit in a deep stupor, age 73. Hint: Think about what "survival" means in relation to the 0-1 representation for STA listed on website.

   (e) Construct a conditional effect plot for the relation between age and survival probability, with separate curves for:

      - an emergency admit that is not comatose
      - an elective admit that is not comatose

      Label the curves and interpret your results.

   (f) Construct the following diagnostic graphs and interpret your results:

      - $\Delta\chi^2_P$ versus $\hat{P}$,
      - $\Delta\chi^2_D$ versus $\hat{P}$.

   (g) Are there any other factors that you would include in this model? If so, what are they? If not, explain. How did you come to this conclusion? Summarize your procedure.