Homework 6
BIOST 515
Due: February 24, 2004 **in class**
This assignment is worth 30 points.

1. Harrell, chapter 10, # 1 (a-f). In part (a), also perform a relative risk regression and a least squares regression with age and sex as predictors. Be sure to interpret your results. In part (f), assess linearity in age by recoding age into dummy variables defined by grouping age into intervals of equal length, compare the results from the two models to see if they are consistent, and then preform an appropriate test for linearity in age.

2. Harrell, chapter 10 #2.

3. A local health clinic sent fliers to its clients to encourage everyone, but especially older persons at high risk of complications, to get a flu shot. In a pilot follow-up study, 50 clients were randomly selected and asked whether they actually received a flu shot. In addition, data were collected on their age (X1) and health awareness. The latter data were combined into a health awareness index (X2), for which higher values indicate greater awareness. A client who received a flu shot was coded $Y = 1$, and a client who did not receive a flu shot was coded $Y = 0$. The data are available on the web site as flu.dat.

   Assess how age and health awareness were related to a client recieving a flu shot using the model
   $$\text{logit}(\pi_i) = \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X1 \times X2.$$

   (a) Find the estimates of β_0, β_1, β_2 and β_3. State the fitted response function.

   (b) Obtain $\exp(\hat{\beta}_1)$. Does it have a simple interpretation? Explain.

   (c) What is the estimated probability that clients aged 55 with a health awareness index of 60 will receive a flu shot?