

**ST745, Spring 2008**

**Homework 4 Due: Thursday, 03/13/2008**

1. The website <http://www.biostat.mcw.edu/homepgs/klein/kidtran.html> contains survival data on 863 kidney transplant patients. There are three covariates collected for each patient: gender, race and age. Fit an exponential AFT model to the data with these three covariates in the model. Answer the following questions:
  - (a) Compare the mean survival times for white and black patients.
  - (b) Since the exponential AFT model is also a proportional hazards model, find the estimates and 95% CIs for the hazard ratios comparing white and black patients.
2. For the data in (1), fit a Weibull AFT model. Answer the following questions:
  - (a) Compare the mean survival times for white and black patients.
  - (b) Since the Weibull AFT model is also a proportional hazards model, find the estimates and 95% CIs for the hazard ratios comparing white and black patients.
3. For the data in (1), fit a log-logistic model and answer the following questions:
  - (a) Compare the mean survival times for white and black patients.
  - (b) Find the estimates and 95% CIs of odds-ratios comparing white and black patients.
4. For the data in (1), assume the Gamma AFT model fits the data well. Conduct likelihood ratio test to see if a Weibull model or exponential model or log-logistic model is reasonable.