BIOSTATISTICS 667
Homework 3

1. Based on Model 2 in Table 8.3 in the textbook, and for race = 0, present a 4×4 table of estimated linear predictors and another 4×4 table of fitted values. Within each group (row), plot the estimated linear predictor against time (column), with joined line segments. Describe what aspects of the graph reflect the estimate of β_3 and β_7.

2. For the TLC data set, fit a linear regression model for the last three observations on the baseline, with three different intercepts and three different slopes. That is, each Y_{ij} has a linear regression on Y_{i1} with intercept α_j and slope β_j, for $j = 2, 3, 4$. Assume an unstructured covariance matrix. Use REML. You'll get an estimate of β (3×1) and the corresponding estimated covariance matrix $\hat{V}$ (3×3) . Do this *separately* in each group; Active and Placebo. So, there will two vectors, $(\hat{\beta}_A, \hat{\beta}_P)$, and two matrices, $(\hat{V}_A, \hat{V}_P)$. Present these two vectors and two matrices. Then compute the test statistic as explained in class. Present the test statistic and the p-value.

   Also perform three separate tests using the numbers given on the midterm exam. Report the three p-values.