

1. Problems from Graybill's *Theory and Application of the Linear Model*.

Chapter 1: 8, 11, 28, 30, 37, 39, 44, 46

2. Determine the specific  $\underline{Y} = \mathbf{X}\underline{\beta} + \underline{e}$  characterization for each of the following models. State the size of each vector of matrix, and determine the entries in  $\mathbf{X}$  and  $\underline{\beta}$ .

- (a) The regression model that regresses  $Y$  on two predictors  $x_1$  and  $x_2$ . Assume that  $n = 5$ .
- (b) The balanced two-factor model with interaction, where Factor A has 2 levels and Factor B has 3 levels. Assume there are 2 observations per cell.
- (c) Redo part (b), but this time assume that cell (1,2) has only one observation and the cell (2,1) is empty.
- (d) Examples 4 & 8 in the Nested & Random Handout.
- (e) Example 5 in the Design Handout.