

Indian Statistical Institute, Delhi Centre

Linear Models and GLM

Spring 2008

Assignment # 5

Date Given: March 28, 2008 (Friday)
To be Discussed on: April 11, 2008 (Friday)

Total Points: 20

1. Consider the following *three-way classification model* with one observation per cell

$$y_{ijk} = \mu + \alpha_i + \beta_j + \gamma_k + \lambda_{12(ij)} + \lambda_{23(jk)} + \lambda_{31(ki)} + \varepsilon_{ijk} \quad 1 \leq i \leq I, 1 \leq j \leq J, 1 \leq k \leq K,$$

where we assume that the errors ε_{ijk} 's are i.i.d. Normal $(0, \sigma^2)$.

- Find all the estimable linear parametric functions.
 - Write the normal equations and find the LSEs.
 - Find the residual sum of square and its degrees of freedom.
 - Write the ANOVA table and interpret the sum of squares for various testing problems.
2. Solve all the exercises from Professor T. Krishnan's lectures, given in the class during the week March 24 - 28, 2008.