

CGIL Summer Course - 2007

3. Maternal Genetic Effects Model Genetic Evaluation and Parameter Estimation

1. Retrieve Fun3.d.(Pedigree file for large number of animals)
2. Create a data set according to the model,

$$y_{ijk} = CG_i + a_j + m_k + p_k + e_{ijk},$$

where CG_i is a fixed contemporary group effect, a_j is the animal additive genetic effect (direct), m_k is the dam maternal genetic effect, p_k is the dam maternal permanent environmental effect, and e_{ijk} is a random residual effect. Assume that the variances are 700 for residual effects, 66 for maternal permanent environmental effects, and

$$\begin{pmatrix} \sigma_a^2 & \sigma_{am} \\ \sigma_{am} & \sigma_m^2 \end{pmatrix} = \begin{pmatrix} 300 & -30 \\ -30 & 180 \end{pmatrix}.$$

- (a) Generate true breeding values (direct and maternal) for all animals.
 - (b) Generate permanent environmental effects for all animals.
 - (c) Generate contemporary group effects.
 - (d) Allocate animals to contemporary groups.
 - (e) Create the observation record.
 - (f) Change observations on all animals with unknown parents to NA.
3. Apply iteration on data techniques to solve the mixed model equations for the data set just created.
 - (a) Compute means and variances of EBVs (direct and maternal) by year of birth for animals with observations.
 - (b) Plot means and variances by year of birth.
 4. Modify the iteration on data technique to do Gibbs sampling, and estimate the variances.