

Animal	Herd	Sire
3	1 → herd ₁	1
4	2 → herd ₂	NA
5	2	4
6	1	5

2 herds

$$\begin{array}{c} y \\ \rightarrow \boxed{4.5} \\ \rightarrow 2.9 \\ 3.9 \\ 3.5 \end{array} = \begin{array}{cc} \text{herd}_1 & \text{herd}_2 \\ \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 1 \\ 1 & 0 \end{bmatrix} & \begin{bmatrix} 0 & 1 \\ 1 & 0 \\ 1 & 0 \\ 0 & 0 \end{bmatrix} \end{array} \beta + \begin{array}{c} Z \\ \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \end{array} \begin{array}{c} u_s \\ \begin{bmatrix} u_1 \\ u_4 \\ u_5 \end{bmatrix} \end{array}$$

Solutions for estimate $\hat{\beta}$ of fixed herd effect β and predictions \hat{u}_s for sire breeding values by Mixed Model Equations.