

<u>Data</u>			
Animal	Sire	Dam	y
i	s	d	$y_i$
$k_1$	i	$l_1$	
$k_2$	i	$l_2$	
$k_n$	i	$l_n$	

Example:

Animal	Sire	Dam	y
1	NA	NA	4.5
2	"	"	2.9
3	"	"	3.9
4	1	2	3.5
5	4	3	5.0

Model components:

$$y = X\mu + Zu + e; \quad y = \begin{bmatrix} 4.5 \\ 2.9 \\ 3.9 \\ 3.5 \\ 5.0 \end{bmatrix}; \quad \beta = \begin{bmatrix} \mu \end{bmatrix}$$

$$X = \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{bmatrix}$$

$$Zu = \begin{bmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \\ u_5 \end{bmatrix}$$

$$Z = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ & 1 & & & \\ & & 1 & & \\ & & & 1 & \\ 0 & & & & 1 \end{bmatrix}$$