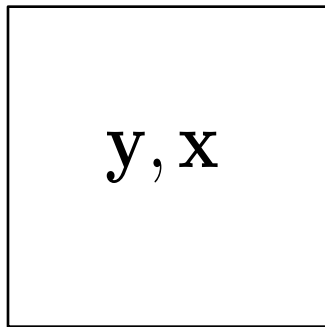


A single “group”



$$g(\beta_0, \beta_1, x_i) = \beta_0 + \beta_1 x_i$$

$$[\beta_0, \beta_1, \sigma^2 \mid y_i] \propto [\beta_0, \beta_1, \sigma^2, y_i]$$

factoring rhs using DAG:

$$[\beta_0, \beta_1, \sigma^2 \mid y_i] \propto [y_i \mid g(\beta_0, \beta_1, x_i), \sigma^2][\beta_0][\beta_1][\sigma^2]$$

joint for all data :

$$[\beta_0, \beta_1, \sigma^2 \mid \mathbf{y}] \propto \prod_{i=1}^n [y_i \mid g(\beta_0, \beta_1, x_i), \sigma^2][\beta_0][\beta_1][\sigma^2]$$

choose specific distributions:

$$\begin{aligned} [\beta_0, \beta_1, \sigma^2 \mid \mathbf{y}] &\propto \prod_{i=1}^n \text{normal}(y_i \mid g(\beta_0, \beta_1, x_i), \sigma^2) \\ &\times \text{normal}(\beta_0 \mid 0, 10000) \text{normal}(\beta_1 \mid 0, 10000) \\ &\times \text{uniform}(\sigma^2 \mid 0, 500) \end{aligned}$$

