

Matrix

$$X = \begin{bmatrix} 1 & 176 & 161 \\ 1 & 177 & 121 \\ \vdots & \vdots & \vdots \\ 1 & 184 & 130 \end{bmatrix}$$

Flag for intercept
Breast Circumference
Height

Model : before

$$y_i = b_0 + b_1 x_{1i} + b_2 x_{2i} + e_i$$

$$\begin{cases} 471 = b_0 + b_1 \cdot 176 + b_2 \cdot 161 + e_1 \\ 463 = b_0 + b_1 \cdot 177 + b_2 \cdot 121 + e_2 \\ \vdots \\ 541 = b_0 + b_1 \cdot 184 + b_2 \cdot 130 + e_{10} \end{cases}$$

New: $y = X \cdot b + e$

$$\begin{bmatrix} 471 \\ 463 \\ \vdots \\ 541 \end{bmatrix} = \begin{bmatrix} 1 & 176 & 161 \\ 1 & 177 & 121 \\ \vdots & \vdots & \vdots \\ 1 & 184 & 130 \end{bmatrix} \cdot \begin{bmatrix} b_0 \\ b_1 \\ b_2 \end{bmatrix} + \begin{bmatrix} e_1 \\ e_2 \\ \vdots \\ e_{10} \end{bmatrix}$$

Dot-Product