Simplified Notation : Matrix-Vector

- Matrix : $X = \begin{bmatrix} x_{10} & x_{11} & x_{12} \\ x_{20} & x_{21} & x_{22} \\ \vdots & \vdots & \vdots \\ \end{bmatrix}$

  x_{i0}: all = 1, Intercept
  x_{i1}: Breast circumference
  x_{i2}: Height

Vectors : $y = \begin{bmatrix} y_1 \\ \vdots \\ y_N \end{bmatrix}$; $b = \begin{bmatrix} b_0 \\ b_1 \\ b_2 \end{bmatrix}$

y: Body weight

b_0 → Intercept
b_1 → Regression coefficient for BC
b_2 → Regression coefficient for Height

Unknown

$e = \begin{bmatrix} e_1 \\ \vdots \\ e_N \end{bmatrix}$

$E(y_i) = b_0 + b_1 x_{1i} + b_2 x_{2i}$

$E(y_1) = b_0 + b_1 x_{11} + b_2 x_{21}$
$E(y_2) = b_0 + b_1 x_{12} + b_2 x_{22}$
$E(y_N)$

$\hookrightarrow E(y) = Xb$

$y = Xb + e \Rightarrow e = y - Xb$