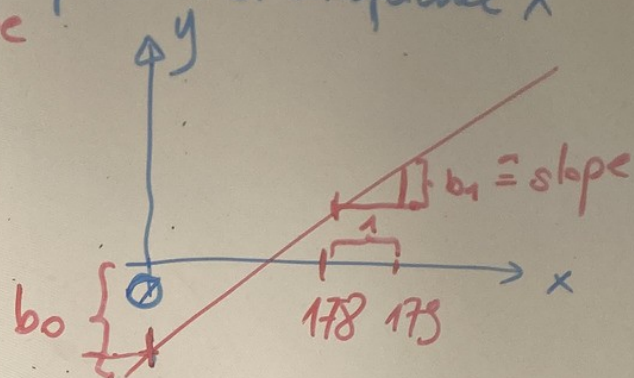


How to find the red-line (Regression line)

□ Red-line gives the expected body weight ($E(y)$) based on a given value of breast circumference x

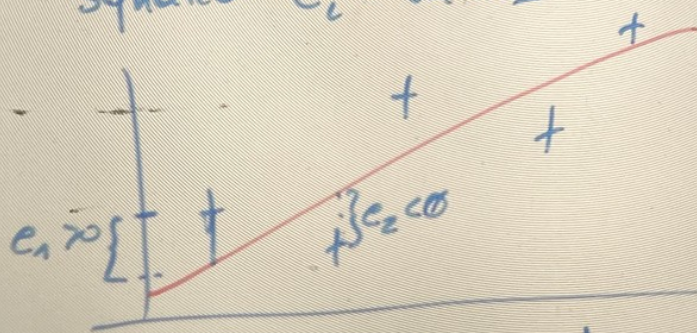
$$\hat{y} = E(y) = \underbrace{b_0}_{\text{intercept}} + \underbrace{b_1 \cdot x}_{\text{slope}}$$



Every observation

$$\begin{aligned} y_i &= E(y) + e_i \\ &= \underbrace{b_0}_{\text{known}} + \underbrace{b_1}_{\text{unknown}} \cdot \underbrace{x_i}_{\text{Observed, known}} + e_i \end{aligned}$$

□ Regression Line (defined by b_0 and b_1) is determined by minimizing the sum of the squared e_i -values



Use: $L = e_1^2 + e_2^2 + \dots + e_n^2$
 $= \sum_{i=1}^n e_i^2$

⇒ Goal: Determine b_0 and b_1 such that L is minimal

Use $y_i = b_0 + b_1 x_i + e_i$