14.2 : least square Method.

Given X, Y

Given Data set $\{(x_i, y_i) ; i = 1, \dots n\}$

$\hat{y} = b_0 + b_1 X$.

to Estimate β_0, β_1.

→ least squares Method :

نقطة قصوى ← Min $\sum_{i=1}^{n} (y_i - \hat{y}_i)^2$ = Min $\sum_{i=1}^{n} (y_i - b_0 - b_1 X_i)^2$ =

Function of 2-variables (b_0, b_1).

MINIMUM

$\underbrace{\hspace{3cm}}_{Q(b_0, b_1)}$

لكي نصل إلى أقل ما يمكن

$\dfrac{\partial Q}{\partial b_0} = 0$, $\dfrac{\partial Q}{\partial b_1} = 0$ ←

معناه أصل إلى Min

Solving the above equations (we call them Normal equations) → ما اسمها معادلات Normal

$b_1 = \dfrac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sum (x_i - \bar{x})^2}$ → slope

$b_0 = \bar{y} - b_1 \bar{x}$ → y-intercept.

→ b_0 : least square estimate for β_0.

b_1 : least square estimate for β_1.

كلام غير واضح = !!