$(x_0, y_0), (x_1, y_1), \ldots, (x_{n-1}, y_{n-1})$

related by $y_i = a_0 + a_1 x_i + e_i$

$a_0 + a_1 x_i$: linear relationship

e_i: error

$e_i = y_i - a_0 - a_1 x_i$

$$S_r = \sum_{i=0}^{n-1} e_i^2 = \sum_{i=0}^{n-1} (y_i - a_0 - a_1 x_i)^2$$

error criterion

↳ minimise

$$\frac{\delta S_r}{\delta a_0} = -2 \sum (y_i - a_0 - a_1 x_i) \quad \text{(slope)}$$

$$\frac{\delta S_r}{\delta a_1} = -2 \sum [(y_i - a_0 - a_1 x_i) x_i] \quad \text{(intercept)}$$

Set both to zero and solve simultaneously...

$$a_0 = \bar{y} - a_1 \bar{x}, \quad a_1 = \frac{\bar{y} - a_0}{\bar{x}}$$

means

Lecture two

Just Gauss-Jordan bits for solving systems of equations, that's it. Expand on this myself