

## Fitting a Straight Line

The equation of a straight line is defined by

$$y = a_0 + a_1 X, \text{ with } a_1 = \frac{n \sum x_i y_i - \sum x_i \sum y_i}{n \sum x_i^2 - (\sum x_i)^2}, a_0 = \bar{y} - a_1 \bar{x}$$

Derive  $a_1$  +  $a_0$  using the general least squares approach:

$$Y = ZA \quad \text{with} \quad A = [Z^T Z]^{-1} [Z^T Y]$$