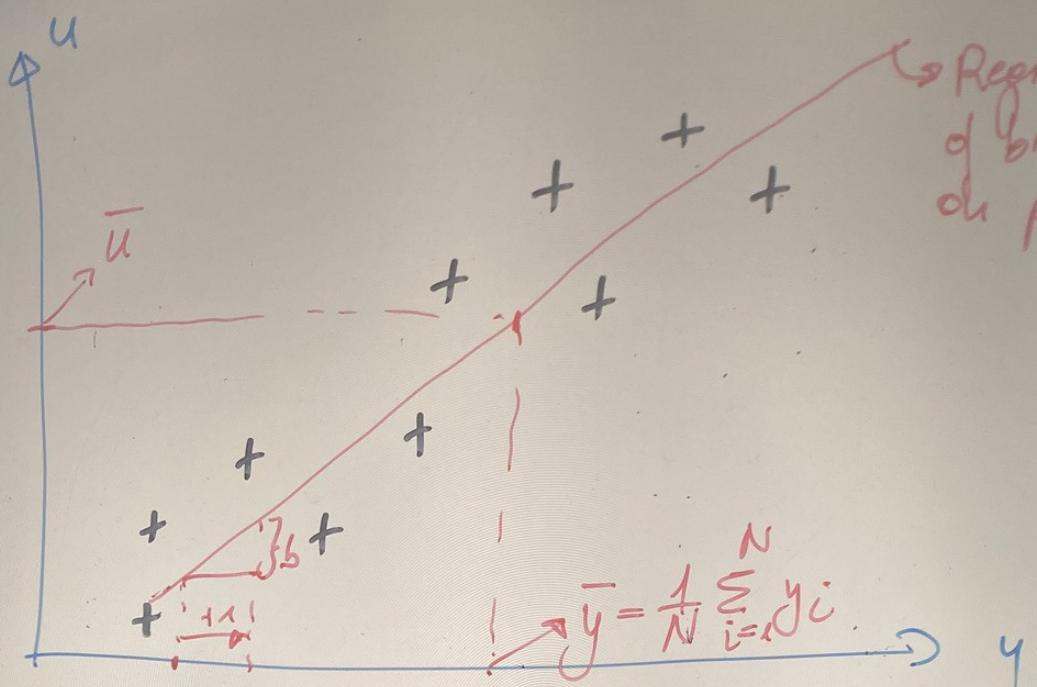
Assume: u_i known



- Regression line is given by slope b and intercept can be determined
- Slope: $b = \frac{cov(u,y)}{var(y)}$; according to definition of slope
- Model: $y_i = \mu + u_i + e_i$

$$\Rightarrow b = \frac{cov(u,y)}{var(y)} = \frac{cov(u,(\mu+u+e))}{var(y)} = \frac{cov(u,u)}{var(y)}$$

$$cov(u,(\mu+u+e)) = \underbrace{cov(u,\mu)}_{=0} + cov(u,u) + \underbrace{cov(u,e)}_{=0}$$

$$cov(u,u) = var(u)$$