

What is pcov ?

The covariance matrix

$$\text{cov}(a, b) = \overline{ab} - \bar{a} \bar{b}$$

Fit parameters a, b, c

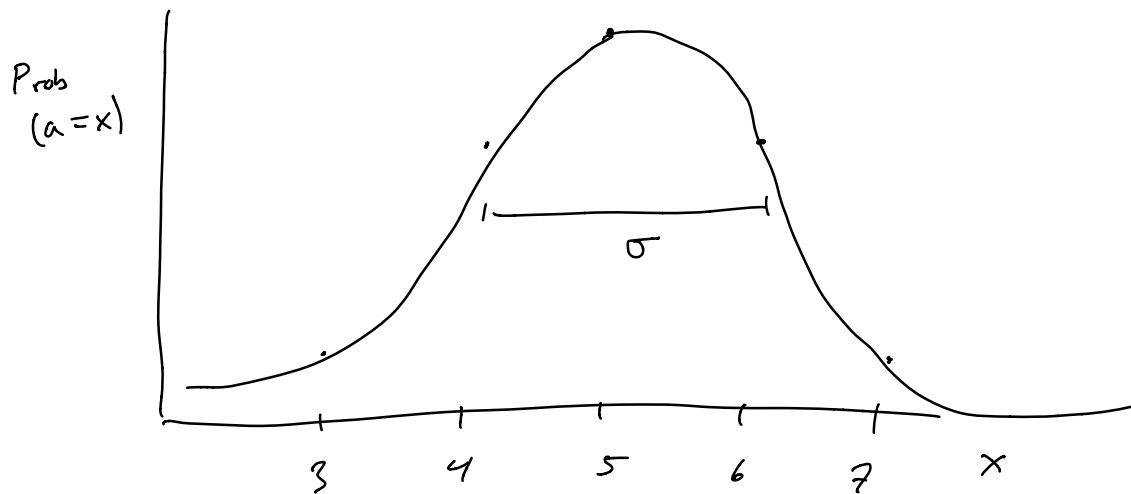
$$\begin{array}{c} a \\ b \\ c \end{array} \begin{pmatrix} \text{cov}(a, a) & \text{cov}(a, b) & \text{cov}(a, c) \\ \text{cov}(b, a) & \text{cov}(b, b) & \text{cov}(b, c) \\ \text{cov}(c, a) & \text{cov}(c, b) & \text{cov}(c, c) \end{pmatrix}$$

$$\text{cov}(a, a) = \overline{a \cdot a} - \bar{a} \cdot \bar{a} = \sigma^2$$

the variance

Variance is related to the uncertainty on the estimates of our fit parameters

$$y = ax + b$$



$\sim 68\%$ chance that true value of a
is in between $(a - \sigma, a + \sigma)$

Bottom line: σ is the "uncertainty"