MAXIMUM LIKELIHOOD

Have a parametric model

$$X_1, \ldots X_n \overset{iid}{\sim} P_X(x|\theta) \text{ or } f_X(x|\theta)$$

observe $x_1, \ldots x_n$

Likelihood function

$$L(\theta) = \begin{cases} \prod_{i=1}^{n} p(x_i|\theta) & \text{if discrete} \\ \prod_{i=1}^{n} f(x_i|\theta) & \text{if continuous} \end{cases}$$

If data are discrete, $L(\theta)$ is the probability of getting the observed data, as a function of θ.

If continuous, roughly proportional to the probability