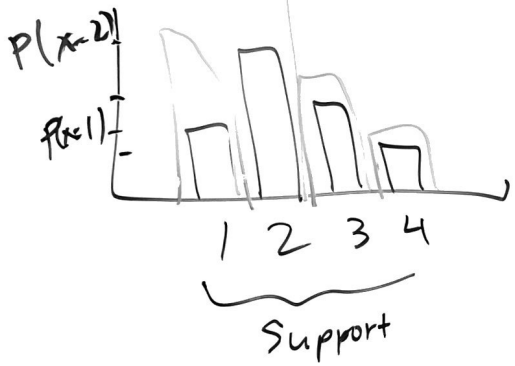
$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Discrete

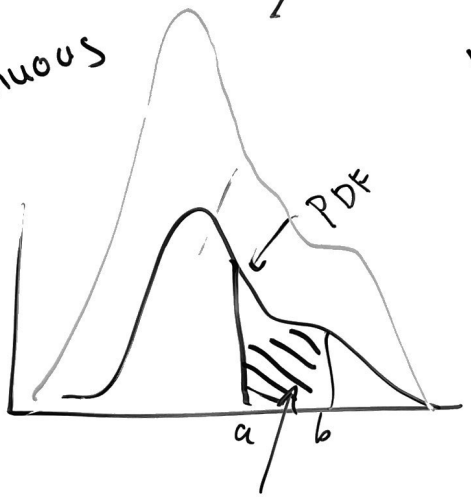
$P(X = x) =$ prob

PMF



Continuous

PDF



$P(a < X < b)$

$$P(X=1) + P(X=2) + \dots + P(X=4) = 1$$

Bernoulli

$$\mathcal{L}(\theta) = \theta^7(1-\theta)^3$$

$$\ell(\theta) = \ln(\mathcal{L}(\theta))$$

$$= 7\ln(\theta) + 3\ln(1-\theta)$$

$$\ell'(\theta) = 0$$

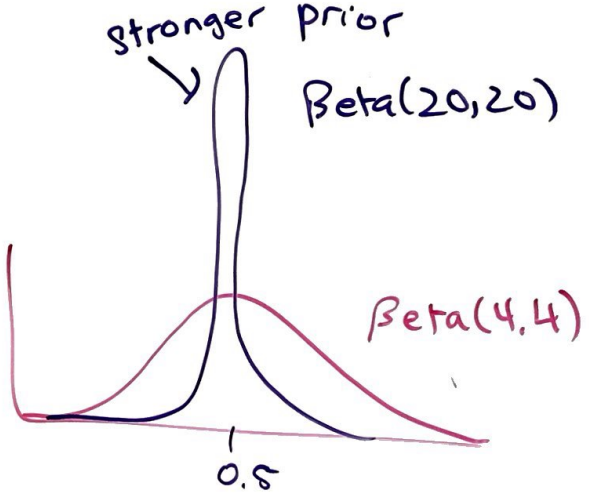
$$\ell'(\theta) = \frac{7}{\theta} - \frac{3}{1-\theta}$$

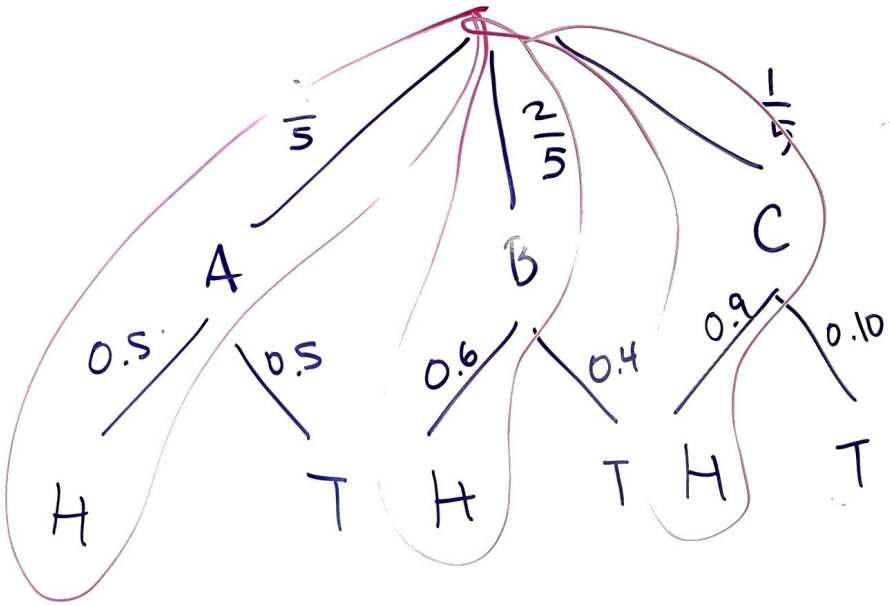
$$\Rightarrow \hat{\theta} = \frac{7}{10} \quad \text{MLE}$$

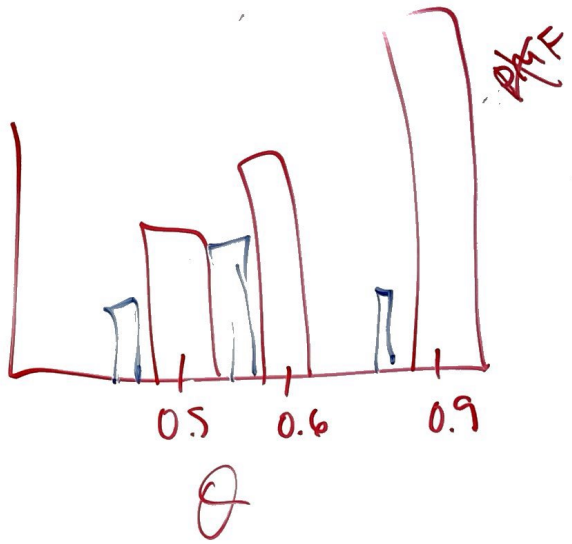
Binomial

$$\mathcal{L}(\theta) = \binom{n}{x} \theta^{\square}(1-\theta)^{\square}$$

Constant w.r.t. θ







$$P(A|H) = \frac{P(H|A) \cdot P(A)}{P(H) = 0.62}$$

$$P(x) = \int p(x,y)\,dy$$

$$P(x) = \sum_{y} p(x,y)$$

...

$-\infty$