

# LDA

Bayes' theorem tells us that:

$$P(y | X) = \frac{P(X|y)P(y)}{\sum_y P(X|y)P(y)}$$

↑                      ↑  
Posterior           Data  
                         likelihood

← Prior

Our book uses a different notation for prior ( $\pi$ ) and likelihood ( $f$ ):

$$P(y = k | X = x) = p_k(x) = \frac{f_k(x)\pi_k}{\sum_y f_k(x)\pi_k}$$