

BAYES THEOREM

$$P(A|B) = \frac{P(A \text{ and } B)}{P(B)} \quad ; \quad P(A \text{ and } B) = P(A|B) \cdot P(B) \quad \text{--- (1)}$$

$$P(B|A) = \frac{P(B \text{ and } A)}{P(A)} \quad ; \quad P(B \text{ and } A) = P(B|A) \cdot P(A) \quad \text{--- (2)}$$

$$P(A \text{ and } B) = P(B \text{ and } A)$$

① and ② are equal

↓
Refer to multiplication document
to understand outcome space
restrictions.

$$P(A|B) \cdot P(B) = P(B|A) \cdot P(A)$$

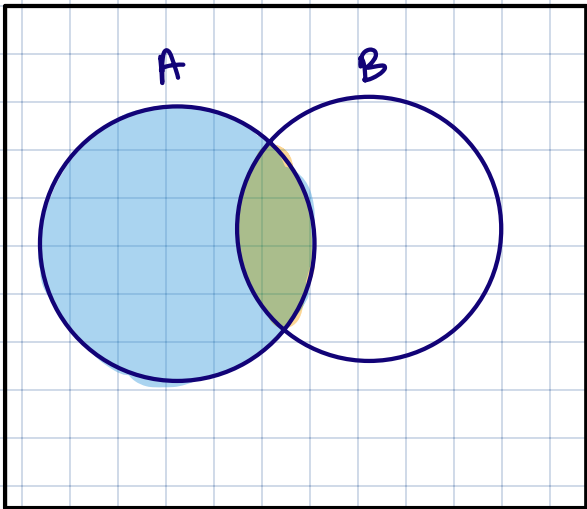
$$P(A|B) = \frac{P(B|A) \cdot P(A)}{P(B)}$$

posterior

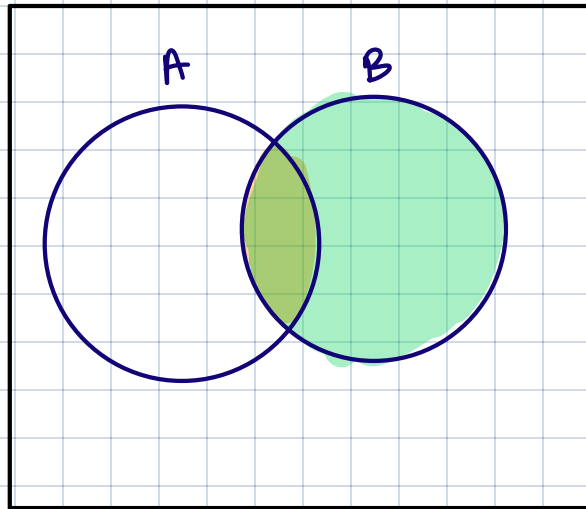
likelihood

prior probability

marginal likelihood.



$$P(B \cap A) = P(B|A)P(A)$$



$$P(A \cap B) = P(A|B)P(B)$$