

# Statistics

## 1 Conditional probability

$$\Pr(A|B) = \frac{\Pr(A \cap B)}{\Pr(B)} \quad \text{where } \Pr(B) \neq 0$$

$$\Pr(A) = \Pr(A|B) \cdot \Pr(B) + \Pr(A|B') \cdot \Pr(B') \quad (\text{law of total probability})$$

For independent events:

- $\Pr(A \cap B) = \Pr(A) \cdot \Pr(B)$
- $\Pr(A|B) = \Pr(A)$
- $\Pr(B|A) = \Pr(B)$