

Review - Probability Theory

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Probability

- Give the frequentist definition of probability.
- Give the degree of belief interpretation of probability.

Axioms and Other Rules

The axioms of probability are

- 1.
- 2.
- 3.

Related rules.

- $P(A^c) =$
- $P(\emptyset) =$
- If $A \subset B$, then

Addition Rules

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

Conditional Probability and Independence

- $P(A|B) =$
- $P(A \cap B) =$
- The following 4 statements are *logically equivalent*. This means that if any of them are true, then all of them are true. Likewise, if any of them are false, then they all must be false.
 - Events A and B are independent.
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Law of Total Probability

If B_1, B_2, \dots, B_k form a partition, then the LoTP state that for any event A

$$\text{version 1: } P(A) =$$

$$\text{version 2: } P(A) =$$

- Subtraction Rule: Recall that $A - B = A \cap B^c$

$$P(A \cap B^c) =$$

Bayes Theorem

Simple case:

$$P(A|B) =$$

General Case: If B_1, B_2, \dots, B_k form a partition, then

$$P(A|B_i) =$$