

305 Lecture 6.2 - About Probability Functions

Brian Weatherson

Plan

- This lecture looks at some general features of probability functions, and looks at some ways to think probabilistically about real world events.

Associated Reading

Odds and Ends, Chapter 5

$$0 \leq \Pr(A) \leq 1$$

Negation

$$\Pr(\neg A) = 1 - \Pr(A)$$

$$\Pr(A) + \Pr(\neg A) = 1$$

Partition

Some events A_1, \dots, A_n form a partition if, necessarily, exactly one of them is true.

- So they are **exclusive** - you can't have any two of them both be true.
- And they are **exhaustive** - you have to have at least one true.

Partition

If A_1, \dots, A_n form a partition then

$$\Pr(A_1) + \dots + \Pr(A_n) = 1$$

Exclusive

If A, B are exclusive

$$\Pr(A \vee B) = \Pr(A) + \Pr(B)$$

General Principle

$$\Pr(A) + \Pr(B) = \Pr(A \vee B) + \Pr(A \wedge B)$$

General Principle

$$\Pr(A) + \Pr(B) = \Pr(A \vee B) + \Pr(A \wedge B)$$

It's worth thinking through why this is true in terms of possibilities.

For Next Time

We'll look at the use of truth trees to estimate probabilities.