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Conditional Probability and Independence Introduction

Introduction

In the last section, we established the five basic rules of probability, which include the two restricted versions of the Addition Rule and Multiplication Rule: The Addition Rule for **Disjoint** Events and the Multiplication Rule for **Independent** Events. We have also established a General Addition Rule for which the events need not be disjoint. In order to complete our set of rules, we still require a General Multiplication Rule for which the events need not be independent. In order to establish such a rule, however, we first need to understand the important concept of **conditional probability.**

This section will be organized as follows: We'll first introduce the idea of conditional probability, and use it to formalize our definition of independent events, which in the first module was presented only in an intuitive way. We will then develop the General Multiplication Rule, a rule that will tell us how to find P(A **and** B) in cases when the events A and B are not necessarily independent. We'll conclude with a discussion of probability trees, a method of displaying conditional probability visually that is very helpful in solving problems.

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