

3.7: Key Terms

Conditional Probability

the likelihood that an event will occur given that another event has already occurred

Contingency Table

the method of displaying a frequency distribution as a table with rows and columns to show how two variables may be dependent (contingent) upon each other; the table provides an easy way to calculate conditional probabilities.

Equally Likely

Each outcome of an experiment has the same probability.

Event

a subset of the set of all outcomes of an experiment; the set of all outcomes of an experiment is called a **sample space** and is usually denoted by S . An event is an arbitrary subset in S . It can contain one outcome, two outcomes, no outcomes (empty subset), the entire sample space, and the like. Standard notations for events are capital letters such as A , B , C , and so on.

Experiment

a planned activity carried out under controlled conditions

Independent Events

The occurrence of one event has no effect on the probability of the occurrence of another event. Events A and B are independent if one of the following is true:

1. $P(A | B) = P(A)$
2. $P(B | A) = P(B)$
3. $P(A \cap B) = P(A)P(B)$

Mutually Exclusive

Two events are mutually exclusive if the probability that they both happen at the same time is zero. If events A and B are mutually exclusive, then $P(A \text{ AND } B) = 0$.

Or Event

An outcome is in the event $A \text{ OR } B$ if the outcome is in A or is in B or is in both A and B .

Outcome

a particular result of an experiment

Probability

a number between zero and one, inclusive, that gives the likelihood that a specific event will occur; the foundation of statistics is given by the following 3 axioms (by A.N. Kolmogorov, 1930's): Let S denote the sample space and A and B are two events in S . Then:

- $0 \leq P(A) \leq 1$
- If A and B are any two mutually exclusive events, then $P(A \cup B) = P(A) + P(B)$.
- $P(S) = 1$

Sample Space

the set of all possible outcomes of an experiment

Tree Diagram

the useful visual representation of a sample space and events in the form of a “tree” with branches marked by possible outcomes together with associated probabilities (frequencies, relative frequencies)

Union: the \cup Event

An outcome is in the event $A \cup B$ if the outcome is in A or is in B or is in both A and B .

Venn Diagram

the visual representation of a sample space and events in the form of circles or ovals showing their intersections

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