

OpenIntro: Statistics

This book introduces students to the discipline of statistics as a science of understanding and analyzing data. Throughout the semester, students learn how to effectively make use of data in the face of uncertainty: how to collect data, how to analyze data, and how to use data to make inferences and conclusions about real world phenomena. The learning goals are as follows:

- Goal 1.** Recognize the importance of data collection, identify limitations in data collection methods and other sources of statistical bias, and determine their implications and how they affect the scope of inference.
- Goal 2.** Use statistical software to summarize data numerically and visually, and to perform data analysis.
- Goal 3.** Have a conceptual understanding of the unified nature of statistical inference.
- Goal 4.** Apply estimation and testing methods to analyze single variables or the relationship between two variables in order to understand natural phenomena and make data-based decisions.
- Goal 5.** Model numerical response variables using a single explanatory variable or multiple explanatory variables in order to investigate relationships between variables.
- Goal 6.** Interpret results correctly, effectively, and in context without relying on statistical jargon.
- Goal 7.** Critique data-based claims and evaluate data-based decisions.
- Goal 8.** Complete two research projects: one that employs simple statistical inference and another that employs more advanced modeling techniques.