A concise introduction to logic 14th

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Overview

A Concise Introduction to Logic, Fourteenth Edition, by Patrick J. Hurley, is a comprehensive textbook designed to teach the fundamental principles of deductive and inductive reasoning. The book is structured to guide students from the basic building blocks of logic—such as identifying arguments and distinguishing premises from conclusions—through formal systems of categorical and propositional logic, and finally to more advanced topics like predicate logic and inductive reasoning. Its main argument is that logic is a practical, learnable skill that empowers individuals to analyze, evaluate, and construct arguments effectively. The text emphasizes the application of logical principles to everyday reasoning, using numerous examples and exercises drawn from real-world sources, including politics, law, and science.

The book is organized into distinct parts that progressively build on each other. The early chapters focus on informal logic, covering language, definition, and fallacies, which are essential for recognizing flawed reasoning. The middle sections delve into formal logic, including categorical propositions, syllogisms, and propositional logic, where students learn to use symbols and truth tables. Later chapters introduce predicate logic and induction, including analogical and causal reasoning. Throughout, Hurley provides clear explanations, step-by-step methods, and a wealth of practice problems, making complex concepts accessible to beginners.

This edition remains a standard in logic education because it balances theoretical rigor with practical application. It matters because it equips readers with critical thinking skills that are vital in academic, professional, and personal contexts. By mastering the techniques in this book, students can improve their ability to construct sound arguments, detect logical errors, and make more rational decisions. The book's enduring popularity attests to its effectiveness as a teaching tool and its relevance in an age of information overload and misinformation.

Key Takeaways

- Identify the conclusion and premises of any argument before evaluating its strength or validity.
- Distinguish between deductive and inductive arguments, and know that deductive arguments aim for certainty while inductive arguments aim for probability.
- Learn to recognize common formal and informal fallacies, such as ad hominem, straw man, and false dilemma, to avoid them in your own reasoning and spot them in others.

• Use Venn diagrams to test the validity of categorical syllogisms, a visual method that clarifies logical relationships.

• Master truth tables and natural deduction to prove the validity of propositional arguments, which are the foundation of symbolic logic.

• Apply predicate logic to represent and analyze arguments that involve quantifiers like 'all', 'some', and 'none', extending beyond simple propositional forms.

• Evaluate inductive arguments, including analogical and causal reasoning, by assessing the strength of the analogy or the causal evidence.

• Practice with the book's extensive exercises to internalize logical techniques, as proficiency comes from active application.

Chapter Summaries

Part I: Informal Logic - Chapter 1: Basic Concepts

This chapter introduces the core concepts of logic, defining arguments as sets of statements where premises support a conclusion. It explains how to identify arguments, distinguish them from non-arguments like explanations and reports, and recognize the difference between deductive and inductive arguments. Key terms include validity, soundness, strength, and cogency. The chapter also covers how to paraphrase and diagram arguments to clarify their structure, providing foundational skills for all subsequent chapters.

Chapter 2: Language: Meaning and Definition

This chapter explores the functions of language, including informative, expressive, and directive uses, and how these relate to argumentation. It discusses various types of definitions, such as stipulative, lexical, precising, and persuasive, and their purposes. The chapter also covers techniques for defining terms, like genus and difference, and the criteria for evaluating definitions, such as clarity and precision. Understanding language is essential for analyzing arguments because ambiguous or vague terms can undermine logical reasoning.

Chapter 3: Informal Fallacies

This chapter catalogs common informal fallacies, which are errors in reasoning that are not due to formal structure but to content or context. It covers fallacies of relevance (e.g., ad hominem, appeal to force, appeal to pity), fallacies of weak induction (e.g., hasty generalization, false cause, slippery slope), fallacies of presumption (e.g., begging the question, false dilemma), and fallacies of ambiguity (e.g., equivocation, amphiboly). Each fallacy is defined with examples, and the chapter emphasizes recognizing them in real-world arguments.

Part II: Formal Logic - Chapter 4: Categorical Propositions

This chapter introduces categorical propositions, which assert relationships between classes (e.g., 'All S are P'). It explains the four standard forms (A, E, I, O) and their distribution of terms. The chapter covers the square of opposition, conversion, obversion, and contraposition, which are operations that transform propositions. It also introduces Venn diagrams as a visual tool for representing categorical propositions, setting the stage for testing syllogisms in the next chapter.

Chapter 5: Categorical Syllogisms

This chapter focuses on categorical syllogisms, which are arguments consisting of two premises and a conclusion, each a categorical proposition. It explains the structure of syllogisms, including major, minor, and middle terms, and the concepts of mood and figure. The chapter provides methods for testing validity, including Venn diagrams and the rules of the syllogism (e.g., the middle term must be distributed). It also covers how to reduce the number of terms and handle singular propositions.

Chapter 6: Propositional Logic

This chapter introduces propositional logic, which uses symbols to represent simple statements and logical connectives (e.g., conjunction, disjunction, negation, conditional). It explains how to translate English sentences into symbolic form and how to use truth tables to determine the truth values of compound propositions. The chapter also covers logical equivalence, tautologies, contradictions, and contingencies, and introduces the concept of validity for propositional arguments, which is tested using truth tables.

Chapter 7: Natural Deduction in Propositional Logic

This chapter presents a method of proof called natural deduction, which uses inference rules (e.g., modus ponens, modus tollens, hypothetical syllogism) and replacement rules (e.g., De Morgan's laws, distribution) to derive conclusions from premises. It teaches students to construct formal proofs step by step, demonstrating the validity of arguments without relying on truth tables. The chapter includes strategies for proof construction and numerous exercises to develop skill.

Chapter 8: Predicate Logic

This chapter extends propositional logic to predicate logic, which handles arguments involving quantifiers and predicates. It introduces symbols for universal and existential quantifiers, and explains how to translate statements like 'All humans are mortal' into symbolic form. The chapter covers the rules of inference for quantifiers, including universal instantiation, universal generalization, existential instantiation, and existential generalization, and shows how to construct proofs in predicate logic.

Part III: Inductive Logic - Chapter 9: Analogy and Legal and Moral Reasoning

This chapter examines inductive arguments based on analogy, which infer that because two things are similar in some respects, they are similar in others. It provides criteria for evaluating analogical arguments, such as the number and relevance of similarities. The chapter also applies these principles to legal reasoning (e.g., precedent) and moral reasoning (e.g., casuistry), showing how analogies are used in practical contexts.

Chapter 10: Causality and Mill's Methods

This chapter focuses on causal reasoning, explaining how to identify cause-and-effect relationships. It introduces Mill's methods: the method of agreement, the method of difference, the joint method, the method of concomitant variations, and the method of residues. These methods provide systematic ways to isolate causal factors. The chapter also discusses the difference between necessary and sufficient conditions and the pitfalls of causal reasoning, such as confusing correlation with causation.

Chapter 11: Probability

This chapter covers the concept of probability and its role in inductive reasoning. It explains the rules of probability, including the addition rule, multiplication rule, and conditional probability, and how to apply them to calculate the likelihood of events. The chapter also discusses the distinction between statistical and inductive probability, and how probability is used in scientific and everyday reasoning. It emphasizes the importance of understanding probability for evaluating evidence.

Chapter 12: Statistical Reasoning

This chapter explores statistical reasoning, including how to interpret and evaluate statistical claims. It covers descriptive statistics (mean, median, mode) and inferential statistics (sampling, confidence intervals). The chapter discusses common errors in statistical reasoning, such as biased samples, misleading averages, and the misuse of percentages. It emphasizes the importance of critical evaluation of statistical evidence in arguments.

Themes

- Critical thinking
- Argument evaluation
- Formal logic
- Informal fallacies
- Inductive reasoning
- Symbolic logic

Notable Quotes

• "Logic is the science of the evaluation of arguments." — Opening definition in Chapter 1, setting the foundation for the entire book.

• "An argument is a group of statements, one or more of which (the premises) are claimed to provide support for, or reasons to believe, one of the others (the conclusion)." — Chapter 1, defining the central concept of an argument.

• "A deductive argument is an argument in which the premises are claimed to provide conclusive support for the conclusion." — Chapter 1, distinguishing deductive from inductive arguments.

• "A fallacy is a defect in an argument that arises from a mistake in reasoning or the creation of an illusion that makes a bad argument appear good." — Chapter 3, introducing the concept of informal fallacies.

• "The purpose of a definition is to explain the meaning of a term." — Chapter 2, discussing the function of definitions.

Frequently Asked Questions

What is A concise introduction to logic 14th about?

It is a textbook that teaches the principles of logic, covering both informal and formal logic. It explains how to identify, analyze, and evaluate arguments, including deductive and inductive reasoning. It includes chapters on categorical logic, propositional logic, predicate logic, and inductive methods like analogy and causality.

Is A concise introduction to logic 14th worth reading?

Yes, if you want to improve your critical thinking skills. It is a standard textbook used in college courses, known for clear explanations and abundant exercises. It is especially valuable for students of philosophy, law, or any field that requires rigorous reasoning. However, it is dense and requires active practice.

How does A concise introduction to logic 14th end?

Spoiler: The book ends with chapters on inductive logic, covering probability and statistical reasoning. It concludes with a discussion of how these inductive methods apply to scientific and everyday reasoning, emphasizing the importance of evaluating evidence. The final chapter reinforces the idea that logic is a practical tool for making rational decisions.

Who should read A concise introduction to logic 14th?

It is ideal for college students taking an introductory logic course, but also for anyone interested in sharpening their reasoning abilities. Professionals in law, science, journalism, and management can benefit from its systematic approach to argument analysis. It is also useful for self-learners who want a structured guide to critical thinking.

How long does it take to read A concise introduction to logic 14th?

The book is about 700 pages, so at a typical reading speed of 250 words per minute, it would take around 20-25 hours to read straight through. However, because it includes exercises and requires practice, most students spend a full semester working through it.