Introduction To Logic Problems And Solutions Nptel

Students learn logic by practicing it—by working through problems, analyzing existing arguments, and constructing their own arguments in plain language and symbolic notation. The Art of Reasoning not only introduces the principles of critical thinking and logic in a clear, accessible, and logical manner—thus practicing what it preaches—but it also provides ample opportunity for students to hone their skills and master course content.

Logic is often perceived as having little to do with the rest of philosophy, and even less to do with real life. Graham Priest explores the philosophical roots of the subject, explaining how modern formal logic addresses many issues.

Written by a creative master of mathematical logic, this introductory text combines stories of great philosophers, quotations, and riddles with the fundamentals of mathematical logic. Author Raymond Smullyan offers clear, incremental presentations of difficult logic concepts. He highlights each subject with inventive explanations and unique problems. Smullyan's accessible narrative provides memorable examples of concepts related to proofs, propositional logic and first-order logic, incompleteness theorems, and incompleteness proofs. Additional topics include undecidability, combinatoric logic, and recursion theory. Suitable for undergraduate and graduate courses, this book will also amuse and enlighten mathematically minded readers. Dover (2014) original publication. See every Dover book in print at www.doverpublications.com

"One of the most careful and intensive among the introductory texts that can be used with a wide range of students. It builds remarkably sophisticated technical skills, a good sense of the nature of a formal system, and a solid and extensive background for more advanced work in logic. . . . The emphasis throughout is on natural deduction derivations, and the text's deductive systems are its greatest strength. Lemmon's unusual procedure of presenting derivations before truth tables is very effective." --Sarah Stebbins, The Journal of Symbolic Logic

First published in Polish in 1936, this classic work was originally written as a popular scientific book - one that would present to the educated layman a clear picture of certain powerful trends of thought in modern logic.

A collection of seventy illustrated logic puzzles set in fantastic locales such as outer space or mythical kingdoms, with explanations of the logical reasoning needed to solve them

"The best introduction to logic you will find."—Martin Gardner "Professor Bennett entertains as she instructs," writes Publishers Weekly about the penetrating yet practical Logic Made Easy. This brilliantly clear and gratifyingly concise treatment of the ancient Greek discipline identifies the illogical in everything from street signs to tax forms. Complete with puzzles you can try yourself, Logic Made Easy invites readers to identify and ultimately remedy logical slips in everyday life. Designed with dozens of visual examples, the book guides you through those hair-raising times when logic is at odds with our language and common sense. Logic Made Easy is indeed one of those rare books that will actually make you a more logical human being.

Logical Forms examines the formal languages of classical first order logic and modal logic, and some alternatives and in each case takes as the central question: how can natural language best be formalized in this formal language? The approach involves close encounters with issues in the philosophy of logic and the philosophy of logic and the philosophy of language.

Part I of this coherent, well-organized text deals with formal principles of inference and definition. Part II explores elementary intuitive set theory, with separate chapters on sets, relations, and functions. Ideal for undergraduates.

Introduction to LogicCourier Corporation

This book introduces the basic inferential patterns of formal logic as they are embedded in everyday life, information technology, and science. It is designed to make clear the basic topics of classical and modern logic. The aim is to improve the reader's ability to navigate both everyday and science-based interactions.

Combining stories of great writers and philosophers with quotations and riddles, this completely original text for first courses in mathematical logic examines problems related to proofs, propositional logic and first-order logic, undecidability, and other topics. 2013 edition.

A lively and engaging look at logic puzzles and their role in recreation, mathematics, and philosophy Logic puzzles were first introduced to the public by Lewis Carroll in the late nineteenth century and have been popular ever since. Games like Sudoku and Mastermind are fun and engrossing recreational activities, but they also share deep foundations in mathematical logic and are worthy of serious intellectual inquiry. Games for Your Mind explores the history and future of logic puzzles while enabling you to test your skill against a variety of puzzles yourself. In this informative and entertaining book, Jason Rosenhouse begins by introducing readers to logic and logic puzzles and goes on to reveal the rich history of these puzzles. He shows how Carroll's puzzles presented Aristotelian logic as a game for children, yet also informed his scholarly work on logic. He reveals how another pioneer of logic puzzles, Raymond Smullyan, drew on classic puzzles about liars and truthtellers to illustrate Kurt Gödel's theorems and illuminate profound questions in mathematical logic. Rosenhouse then presents a new vision for the future of logic puzzles based on nonclassical logic, which is used today in computer science and automated reasoning to manipulate large and sometimes contradictory sets of data. Featuring a wealth of sample puzzles ranging from simple to extremely challenging, this lively and engaging book brings together many of the most ingenious puzzles ever devised, including the "Hardest Logic Puzzle Ever," metapuzzles, paradoxes, and the logic puzzles in detective stories.

In a republican nation, whose citizens are to be led by reason and persuasion and not by force, the art of reasoning becomes of the first importance. — Thomas Jefferson Since the publication of the first edition in 1949, Irving M. Copi's Introduction to Logic has served thousands of instructors and students in both teaching and studying the fundamentals of classical and modern logic. In response to numerous instructors' requests for a truly concise introductory logic text for use in their courses, Prentice Hall is proud to present Essentials of Logic. Redacted from Copi & Cohen's Introduction to Logic, Eleventh Edition, this new concise edition provides a reliable, rigorous treatment of logic concepts as in the comprehensive version, but in a manner and style that is simpler, leaner, and with numerous aids for students to ensure their comprehension of the material. Virtually all of the topics covered in the Eleventh Edition find expression within Essentials of Logic. We are confident that the material covered and explication presented in Essentials of Logic will satisfy the needs of many instructors of logic who are seeking a more circumscribed treatment of logic for their students. Features ofEssentials of Logic Chapter/section reduction and coverage.The number of chapters has been reduced from 14 to 9, and the number of sections within chapters has been reduced from 85 to 62. Most topics from Introduction to Logic were retained and many were merged in this text. Exercise sets.The exercise sets include over 800 exercises, including new, simpler exercises for this concise version, coupled with a generous selection of exercises from the Introduction to Logic. Together, the exercises offer students an extensive array of problems with levels of difficulty that move from simpler to more complex in order to help students learn how to apply what they've learned at first more easily, so that they have the confidence to tackle more demanding problems as they progress through the exercise sets. Increased use of charts, tables, and illustrated examples.In addition to new exercises, there are new charts, tables, and illustrated examples included in this concise edition. Former president Richard M. Nixon's appeal to authority during a news conference during Watergate is highlighted in Chapter 2's treatment of fallacies. A celebrity actor's likeness is used to explain the act of equivocation. A famous civil defense film's narration demonstrates propagandistic appeals better than any hypothetical illustration ever could! And a special flowchart, developed by Professor Dan Plage of James Madison University, helps walk students through the application of the six rules of validity for categorical syllogisms. These and other pedagogic aids help increase student comprehension, and enjoyment, of this challenging subject of logic. Instructor supplements.AccompanyingEssentials of Logicfor instructors are a solutions

manual and an instructor's manual with sample test questions. The test questions are also available in a computerized test manager program to aid in the preparation of tests for students. Student supplements.There are two print supplements for students. These include a study guide and a new lecture notebook calledLogicNotes.This new notebook provides all relevant section headings inEssentials of Logicwith space for students to take notes, during their reading of the text and/or during lectures with their instructor on the material in the text. There is also a revision of Prentice Hall's groundbreaking logic tutorial,eLogic!This tutorial is now available exclusively on CD-ROM, and includes over 500 of the exercises inEssentials of Logicfor students to work electronically. Together with the exercises from the text,eLogicincludes the tools students need to solve logic problems. Students can work problems, including diagramming arguments, creating Venn diagrams, constructing truth tables, and building proofs, and students receive constant feedback to guide them through solutions. Students can submit their work via email or hardcopy to their instructors, together with a Log Book showing how well they did. The following walkthrough provides an initial introduction to what awaits students in their use ofeLogic! After students enter their own username and email address, they will decide which exercises they need to work by locating the appropriate chapter, and entering into the appropriate section where the exercises reside. Numerous navigation links are always available on the main screen, including help and access to the Log Book, where students can see which exercises they've worked on and how well they've done! NOTE that students can always refresh their understanding on how to useeLogicthrough the help link! Students select exercises by chapter section, and have ready at their command all necessary toolkits to solve logic problemsincluding diagramming arguments, Venn diagrams, truth tables, proof checkers, and a symbolic notation editor. Additionally, rules and a glossary are available for student reference.

Puzzle guru Richard Manchester has compiled another collection of first rate logic problems. All the answers can be found right in front of you, hidden in the background story and text based clues. So bring your brain power, put on your deductive reasoning hat and get ready to tackle this ULTIMATE challenge!!

This book introduces the fundamental methods and techniques of correct reasoning, in a manner that shows the relevance of the topics to readers' everyday lives. Many new exercises introduced in this edition help supplement and support explanations, aid in review, and make the book visually stimulating. This edition also includes a revised Logic tutorial on CD-Rom--further simplifying the study of logic. Includes many fascinating illustrations taken from the history of science as well as from contemporary research in the physical and biological sciences, plus introduces an abundance of new exercises throughout, complete with solutions for the first exercise in a set. Appropriate for those in business, education, political, or psychology careers.

At the intersection of mathematics, computer science, and philosophy, mathematical logic examines the power and limitations of formal mathematical thinking. In this expansion of Leary's user-friendly 1st edition, readers with no previous study in the field are introduced to the basics of model theory, proof theory, and computability theory. The text is designed to be used either in an upper division undergraduate classroom, or for self study. Updating the 1st Edition's treatment of languages, structures, and deductions, leading to rigorous proofs of Godel's First and Second Incompleteness Theorems, the expanded 2nd Edition includes a new introduction to incompleteness through computability as well as solutions to selected exercises.

Students learn logic by practicing it--by working through problems, analyzing existing arguments, and constructing their own arguments in plain language and symbolic notation. The Art of Reasoning not only introduces the principles of critical thinking and logic in a clear, accessible, and logical manner--thus practicing what it preaches--but it also provides ample opportunity for students to hone their skills and master course content.

A Mathematical Introduction to Logic, Second Edition, offers increased flexibility with topic coverage, allowing for choice in how to utilize the textbook in a course. The author has made this edition more accessible to better meet the needs of today's undergraduate mathematics and philosophy students. It is intended for the reader who has not studied logic previously, but who has some experience in mathematical reasoning. Material is presented on computer science issues such as computational complexity and database queries, with additional coverage of introductory material such as sets. * Increased flexibility of the text, allowing instructors more choice in how they use the textbook in courses. * Reduced mathematical rigour to fit the needs of undergraduate students

Investigates the application of logic to problem solving and computer programming. Requires no previous knowledge in this field, and therefore can be used as an introduction to logic, the theory of problem-solving and computer programming. Annotation copyrighted by Book News, Inc., Portland, OR

"An introductory logic textbook. The Art of Reasoning, 5e, shows students how logic can be applied to everyday life in each chapter, uses real-world examples to explain core concepts, and includes a new chapter on the cognitive biases and errors students are most likely to encounter in their own thinking"--

This book is a gentle but rigorous introduction to formal logic. It is intended primarily for use at the college level. However, it can also be used for advanced secondary school students, and it can be used at the start of graduate school for those who have not yet seen the material. The approach to teaching logic used here emerged from more than 20 years of teaching logic to students at Stanford University and from teaching logic to tens of thousands of others via online courses on the World Wide Web. The approach differs from that taken by other books in logic in two essential ways, one having to do with content, the other with form. Like many other books on logic, this one covers logical syntax and semantics and proof theory plus induction. However, unlike other books, this book begins with Herbrand semantics rather than the more traditional Tarskian semantics. This approach makes the material considerably easier for students to understand and leaves them with a deeper understanding of what logic is all about. The primary content difference concerns the semantics of the logic that is taught. In addition to this text, there are online exercises (with automated grading), online logic tools and applications, online videos of lectures, and an online forum for discussion. They are available at logic.stanford.edu/intrologic/.

Introduction to Logic combines likely the broadest scope of any logic textbook available with clear, concise writing and interesting examples and arguments. Its key features, all retained in the Second Edition, include: • simpler ways to test arguments than those available in competing textbooks, including the star test for syllogisms • a wide scope of materials, making it suitable for introductory logic courses (as the primary text) or intermediate classes (as the primary or supplementary book) • engaging and easy-to-understand examples and arguments, drawn from everyday life as well as from the great philosophers • a suitability for self-study and for preparation for standardized tests, like the LSAT • a reasonable price (a third of the cost of many competitors) • exercises that correspond to the LogiCola program, which may be downloaded for free from the web. This Second Edition also: • arranges chapters in a more useful way for students, starting with the easiest material and then gradually increasing in difficulty • provides an even broader scope with new chapters on the history of logic, deviant logic, and the philosophy of logic • expands the section on informal fallacies • includes a more exhaustive index and a new appendix on suggested further readings • updates the LogiCola instructional program, which is now more visually attractive as well as easier to download, install, update, and use.

"Forall x is an introduction to sentential logic and first-order predicate logic with identity, logical systems that significantly influenced twentieth-century analytic philosophy. After working through the material in this book, a student should be able to understand most quantified expressions that arise in their philosophical reading. This books treats symbolization, formal semantics, and proof theory for each language. The discussion of formal semantics is more direct than in many introductory texts. Although forall x does not contain proofs of soundness and completeness, it lays the groundwork for understanding why these are things that need to be proven. Throughout the book, I have tried to

highlight the choices involved in developing sentential and predicate logic. Students should realize that these two are not the only possible formal languages. In translating to a formal language, we simplify and profit in clarity. The simplification comes at a cost, and different formal languages are suited to translating different parts of natural language. The book is designed to provide a semester's worth of material for an introductory college course. It would be possible to use the book only for sentential logic, by skipping chapters 4-5 and parts of chapter 6"--Open Textbook Library.

This is a systematic and well-paced introduction to mathematical logic. Excellent as a course text, the book does not presuppose any previous knowledge and can be used also for self-study by more ambitious students. Starting with the basics of set theory, induction and computability, it covers propositional and first-order logic their syntax, reasoning systems and semantics. Soundness and completeness results for Hilbert's and Gentzen's systems are presented, along with simple decidability arguments. The general applicability of various concepts and techniques is demonstrated by highlighting their consistent reuse in different contexts. Unlike in most comparable texts, presentation of syntactic reasoning systems precedes the semantic explanations. The simplicity of syntactic constructions and rules of a high, though often neglected, pedagogical value aids students in approaching more complex semantic issues. This order of presentation also brings forth the relative independence of syntax from the semantics, helping to appreciate the importance of the purely symbolic systems, like those underlying computers. An overview of the history of logic precedes the main text, in which careful presentation of concepts, results and examples is accompanied by the informal analogies and illustrations. These informal aspects are kept clearly apart from the technical ones. Together, they form a unique text which may be appreciated equally by lecturers and students occupied with mathematical precision, as well as those interested in the relations of logical formalisms to the problems of computability and the philosophy of mathematical logic.

Designed for students with no prior training in logic, INTRODUCTION TO LOGIC AND CRITICAL THINKING offers an accessible treatment of logic that enhances understanding of reasoning in everyday life. The text begins with an introduction to arguments. After some linguistic preliminaries, the text presents a detailed analysis of inductive reasoning and associated fallacies. This order of presentation helps to motivate the use of formal methods in the subsequent sections on deductive logic and fallacies. Lively and straightforward prose assists students in gaining facility with the sometimes challenging concepts of logic. By combining a sensitive treatment of ordinary language arguments with a simple but rigorous exposition of basic principles of logic, the text develops students' understanding of the relationships between logic and language, and strengthens their skills in critical thinking. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Table of contents

The brain is a wonderful thing to tease. Two hundred grid-based logic puzzles from Puzzle Baron, the mega-popular online puzzle site! For each puzzle, readers are given a background story and a list of clues and then left with only pure logic to arrive at the correct answer. Unlike other logic puzzle books, every puzzle includes statistics-such as the average completion time, the record completion time, and the percentage of people to complete the puzzle-to bring out the competitor in each puzzler and better inform them on how easy or difficult each puzzle is. ?Features 200 grid-based logic puzzles ?Includes puzzles statistics for added excitement ?Ideal for kids and adults

This is a compact mtroduction to some of the pnncipal tOpICS of mathematical logic . In the belief that beginners should be exposed to the most natural and easiest proofs, I have used free-swinging set-theoretic methods. The significance of a demand for constructive proofs can be evaluated only after a certain amount of experience with mathematical logic has been obtained. If we are to be expelled from "Cantor's paradise" (as nonconstructive set theory was called by Hilbert), at least we should know what we are missing. The major changes in this new edition are the following. (1) In Chapter 5, Effective Computability, Turing-computabIlity IS now the central notion, and diagrams (flow-charts) are used to construct Turing machines. There are also treatments of Markov algorithms, Herbrand-Godel-computability, register machines, and random access machines. Recursion theory is gone into a little more deeply, including the s-m-n theorem, the recursion theorem, and Rice's Theorem. (2) The proofs of the Incompleteness Theorems are now based upon the Diagonalization Lemma. Lob's Theorem and its connection with Godel's Second Theorem are also studied. (3) In Chapter 2, Quantification Theory, Henkin's proof of the completeness theorem has been postponed until the reader has gained more experience in proof techniques. The exposition of the proof itself has been improved by breaking it down into smaller pieces and using the notion of a scapegoat theory. There is also an entirely new section on semantic trees.

This leading text for symbolic or formal logic courses presents all techniques and concepts with clear, comprehensive explanations, and includes a wealth of carefully constructed examples. Its flexible organization (with all chapters complete and self-contained) allows instructors the freedom to cover the topics they want in the order they choose.

Except for this preface, this study is completely self-contained. It is intended to serve both as an introduction to Quantification Theory and as an exposition of new results and techniques in "analytic" or "cut-free" methods. We use the term "analytic" to apply to any proof procedure which obeys the subformula principle (we think of such a procedure as "analysing" the formula into its successive components). Gentzen cut-free systems are perhaps the best known example of ana lytic proof procedures. Natural deduction systems, though not usually analytic, can be made so (as we demonstrated in [3]). In this study, we emphasize the tableau point of view, since we are struck by its simplicity and mathematical elegance. Chapter I is completely introductory. We begin with preliminary material on trees (necessary for the tableau method), and then treat the basic syntactic and semantic fundamentals of propositional logic. We use the term "Boolean valuation" to mean any assignment of truth values to all formulas which satisfies the usual truth-table conditions for the logical connectives. Given an assignment of truth-values to all propositional variables, the truth-values of all other formulas under this assignment is usually defined by an inductive procedure. We indicate in Chapter I how this inductive definition can be made explicit-to this end we find useful the notion of a formation tree (which we discuss earlier).

Considered the best book in the field, this completely self-contained study is both an introduction to quantification theory and an exposition of new results and techniques in "analytic" or "cut free" methods. The focus in on the tableau point of view. Topics include trees, tableau method for propositional logic, Gentzen systems, more. Includes 144 illustrations.

In this entertaining and challenging collection of logic puzzles, Raymond Smullyan - author of Forever Undecided - continues to delight and astonish us with his gift for making available, in the thoroughly pleasurable form of puzzles, some of the most important mathematical thinking of our time. In the first part of the book, he transports us once again to that wonderful realm where knights, knaves, twin sisters, quadruplet

brothers, gods, demons, and mortals either always tell thetruth or always lie, and where truth-seekers are set a variety of fascinating problems. The section culminates in an enchanting and profound metapuzzle in which Inspector Craig of Scotland Yard gets involved in a search for the Fountain of Youth on the Island of Knights and Knaves. In the second part of To Mock a Mockingbird, we accompany the Inspector on a summer-long adventure into the field of combinatory logic (a branch of logic that plays an important role in computer science and artificial intelligence). His adventure, which includes enchanted forests, talking birds, bird sociologists, and a classic quest, provides for us along the way the pleasure of solving puzzles of increasing complexity until we reach the Master Forest and - thanks to Godel's famous theorem - the final revelation.

A thorough and practical introduction to inductive logic with a focus on arguments and the rules used for making inductive inferences. This textbook offers a thorough and practical introduction to inductive logic. The book covers a range of different types of inferences with an emphasis throughout on representing them as arguments. This allows the reader to see that, although the rules and guidelines for making each type of inference differ, the purpose is always to generate a probable conclusion. After explaining the basic features of an argument and the different standards for evaluating arguments, the book covers inferences that do not require precise probabilities or the probability calculus: the induction by confirmation, inference to the best explanation, and Mill's methods. The second half of the book presents arguments that do require the probability calculus, first explaining the rules of probability, and then the proportional syllogism, inductive generalization, and Bayes' rule. Each chapter ends with practice problems and their solutions. Appendixes offer additional material on deductive logic, odds, expected value, and (very briefly) the foundations of probability. Argument and Inference can be used in critical thinking courses. It provides these courses with a coherent theme while covering the type of reasoning that is most often used in day-to-day life and in the natural, social, and medical sciences. Argument and Inference is also suitable for inductive logic and informal logic courses, as well as philosophy of sciences courses that need an introductory text on scientific and inductive methods.

Mathematical logic developed into a broad discipline with many applications in mathematics, informatics, linguistics and philosophy. This text introduces the fundamentals of this field, and this new edition has been thoroughly expanded and revised.

Logic concepts are more mainstream than you may realize. There’s logic every place you look and in almost everything you do, from deciding which shirt to buy to asking your boss for a raise, and even to watching television, where themes of such shows as CSI and Numbers incorporate a variety of logistical studies. Logic For Dummies explains a vast array of logical concepts and processes in easy-to-understand language that make everything clear to you, whether you’re a college student of a student of life. You’ll find out about: Formal Logic Syllogisms Constructing proofs and refutations Propositional and predicate logic Modal and fuzzy logic Symbolic logic Deductive and inductive reasoning Logic For Dummies tracks an introductory logic course at the college level. Concrete, real-world examples help you understand each concept you encounter, while fully worked out proofs and fun logic problems encourage you students to apply what you’ve learned.

This introduction to mathematical logic explores philosophical issues and Gödel's Theorem. Its widespread influence extends to the author of Gödel, Escher, Bach, whose Pulitzer Prize–winning book was inspired by this work.

The Logic Manual is the ideal introduction to logic for beginning philosophy students. It offers a concise but complete introductory course, giving a firm grounding in the logic that is needed to study contemporary philosophy. Exercises, examples, and sample examination papers are provided on an accompanying website.

Tens of thousands of students have learned to be more discerning at constructing and evaluating arguments with the help of Patrick J. Hurley. Hurley’s lucid, friendly, yet thorough presentation has made A CONCISE INTRODUCTION TO LOGIC the most widely used logic text in North America. In addition, the book’s accompanying technological resources, such as CengageNOW and Learning Logic, include interactive exercises as well as video and audio clips to reinforce what you read in the book and hear in class. In short, you’ll have all the assistance you need to become a more logical thinker and communicator. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.