In Code A Mathematical Journey Sarah Flannery

In Code **The Mathematical Theory of Coding** Math Adventures with Python **Error Correcting Codes** *The Theory of Information and Coding* Mathematics of Information and Coding **Error Correction Coding** *Mathematical Methods in Computer Science* **Lattices and Codes** Geometry and Codes The BOOK of PHI, Volume 4 *Math for Programmers* **Coding the Matrix** Introduction to the Theory of Error-Correcting Codes 100 Mathematical Python Coding Exercises with Solutions Keys **Codes and Automata** Information and Coding Theory **The Cryptoclub A Mathematical Theory for Optimising Parallel Code Recent Trends in Coding Theory and Its Applications Crack the Code** *The Original Code in the Bible* **Mathematical Ideas Expanded Edition Value Pack (Includes Tutor Center Access Code & Video Lectures on CD with Optional Captioning for Mathematical Ide** A Mathematical Approach to the Simple Bulls and Cows Code Breaking Game *MyLab Math with Pearson EText -- Standalone Access Card -- Mathematical Ideas* **Computational Discrete Mathematics** *Basic Mathematics for Engineers (8th Ed.)* **Mathematical Modeling and Computation in Finance: with Exercises and Python and MATLAB Computer Codes Proceedings of the Fourth International Congress on Mathematical Education** Math Code *Mathematical Objects in C++* **Practical Python AI Projects A First Course in Coding Theory Mathematics of the Incas** Coding and Information Theory **Five More Golden Rules** Applying Math with Python *Cracking The Mental Math Code* **Refining the Mathematics Knowledge Base** Designs, Graphs, Codes and Their Links

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Math Code Apr 28 2020 Spurling reveals the secret code that Jesus died to protect.

The Cryptoclub May 10 2021 Join the Cryptokids as they apply basic mathematics to make and break secret codes. This book has many hands-on activities that have been tested in both classrooms and informal settings. Classic coding methods are discussed, such as Caesar, substitution, Vigen , and multiplicative ciphers as well as the modern RSA. Math topics covered include: - Addition and Subtraction with, negative numbers, decimals, and percentages - Factorization - Modular Arithmetic - Exponentiation - Prime Numbers - Frequency Analysis.The accompanying workbook, The Cryptoclub Workbook: Using Mathematics to Make and Break Secret Codes provides students with problems related to each section to help them master the concepts introduced throughout the book. A PDF version of the workbook is available at no charge on the download tab, a printed workbook is available for $19.95 (K00701). The teacher manual can be requested from the publisher by contacting the Academic Sales Manager, Susie Carlisle

Computational Discrete Mathematics Sep 02 2020 This book is based on a graduate education program on computational discrete mathematics run for several years in Berlin, Germany, as a joint effort of theoretical computer scientists and mathematicians in order to support doctoral students and advanced ongoing education in the field of discrete mathematics and algorithmics. The 12 selected lectures by leading researchers presented in this book provide recent research results and advanced topics in a coherent and consolidated way. Among the areas covered are combinatorics, graph theory, coding theory, discrete and computational geometry, optimization, and algorithmic aspects of algebra.

Mathematical Ideas Expanded Edition Value Pack (Includes Tutor Center Access Code & Video Lectures on CD with Optional Captioning for Mathematical Ide Dec 05 2020

Proceedings of the Fourth International Congress on Mathematical Education May 30 2020 Henry O. Pollak Chairman of the International Program Committee Bell Laboratories Murray Hill, New Jersey, USA The Fourth International Congress on Mathematics Education was held in Berkeley, California, USA, August 10-16, 1980. Previous Congresses were held in Lyons in 1969, Exeter in 1972, and Karlsruhe in 1976. Attendance at Berkeley was about 1800 full and 500 associate members from about 90 countries; at least half of these come from outside of North America. About 450 persons participated in the program either as speakers or as presiders; approximately 40 percent of these came from the U.S. or Canada. There were four plenary addresses; they were delivered by Hans Freudenthal on major problems of mathematics education, Hermina Sinclair on the relationship between the learning of language and of mathematics, Seymour Papert on the computer as carrier of mathematical culture, and Hua Loo-Keng on popularising and applying mathematical methods. Gearge Polya was the honorary president of the Congress; illness prevented his planned attendence but he sent a brief presentation entitled, "Mathematics Improves the Mind". There was a full program of speakers, panelists, debates, miniconferences, and meetings of working and study groups. In addition, 18 major projects from around the world were invited to make presentations, and various groups representing special areas of concern had the opportunity to meet and to plan their future activities.

Math Adventures with Python Aug 25 2022 Learn math by getting creative with code! Use the Python programming language to transform learning high school-level math topics like algebra, geometry, trigonometry, and calculus! Math Adventures with Python will show you how to harness the power of programming to keep math relevant and fun. With the aid of the Python programming language, you'll learn how to visualize solutions to a range of math problems as you use code to explore key mathematical concepts like algebra, trigonometry, matrices, and cellular automata. Once you've learned the programming basics like loops and variables, you'll write your own programs to solve equations quickly, make cool things like an interactive rainbow grid, and automate tedious tasks like factoring numbers and finding square roots. You'll learn how to write functions to draw and manipulate shapes, create oscillating sine waves, and solve equations graphically. You'll also learn how to: - Draw and transform 2D and 3D graphics with matrices - Make colorful designs like the Mandelbrot and Julia sets with complex numbers - Use recursion to create fractals like the Koch snowflake and the Sierpinski triangle - Generate virtual sheep that graze on grass and multiply autonomously - Crack secret codes using genetic algorithms As you work through the book's numerous examples and increasingly challenging exercises, you'll code your own solutions, create beautiful visualizations, and see just how much more fun math can be!

Error Correcting Codes Jul 24 2022 Assuming little previous mathematical knowledge, Error Correcting Codes provides a sound introduction

to key areas of the subject. Topics have been chosen for their importance and practical significance, which Baylis demonstrates in a rigorous but gentle mathematical style. Coverage includes optimal codes; linear and non-linear codes; general techniques of decoding errors and erasures; error detection; syndrome decoding, and much more. Error Correcting Codes contains not only straight maths, but also exercises on more investigational problem solving. Chapters on number theory and polynomial algebra are included to support linear codes and cyclic codes, and an extensive reminder of relevant topics in linear algebra is given. Exercises are placed within the main body of the text to encourage active participation by the reader, with comprehensive solutions provided. Error Correcting Codes will appeal to undergraduate students in pure and applied mathematical fields, software engineering, communications engineering, computer science and information technology, and to organizations with substantial research and development in those areas.

The Mathematical Theory of Coding Sep 26 2022 The Mathematical Theory of Coding focuses on the application of algebraic and combinatoric methods to the coding theory, including linear transformations, vector spaces, and combinatorics. The publication first offers information on finite fields and coding theory and combinatorial constructions and coding. Discussions focus on self-dual and quasicyclic codes, quadratic residues and codes, balanced incomplete block designs and codes, bounds on code dictionaries, code invariance under permutation groups, and linear transformations of vector spaces over finite fields. The text then takes a look at coding and combinatorics and the structure of semisimple rings. Topics include structure of cyclic codes and semisimple rings, group algebra and group characters, rings, ideals, and the minimum condition, chains and chain groups, dual chain groups, and matroids, graphs, and coding. The book ponders on group representations and group codes for the Gaussian channel, including distance properties of group codes, initial vector problem, modules, group algebras, andrepresentations, orthogonality relationships and properties of group characters, and representation of groups. The manuscript is a valuable source of data for mathematicians and researchers interested in the mathematical theory of coding.

Information and Coding Theory Jun 11 2021 This text is an elementary introduction to information and coding theory. The first part focuses on information theory, covering uniquely decodable and instantaneous codes, Huffman coding, entropy, information channels, and Shannon's Fundamental Theorem. In the second part, linear algebra is used to construct examples of such codes, such as the Hamming, Hadamard, Golay and Reed-Muller codes. Contains proofs, worked examples, and exercises.

A First Course in Coding Theory Jan 26 2020 Algebraic coding theory is a new and rapidly developing subject, popular for its many practical applications and for its fascinatingly rich mathematical structure. This book provides an elementary yet rigorous introduction to the theory of error-correcting codes. Based on courses given by the author over several years to advanced undergraduates and first-year graduated students, this guide includes a large number of exercises, all with solutions, making the book highly suitable for individual study.

Mathematical Modeling and Computation in Finance: with Exercises and Python and MATLAB Computer Codes Jun 30 2020 This book discusses the interplay of stochastics (applied probability theory) and numerical analysis in the field of quantitative finance. The stochastic models, numerical valuation techniques, computational aspects, financial products, and risk management applications presented will enable readers to progress in the challenging field of computational finance. When the behavior of financial market participants changes, the corresponding stochastic mathematical models describing the prices may also change. Financial regulation may play a role in such changes too. The book thus presents several models for stock prices, interest rates as well as foreign-exchange rates, with increasing complexity across the chapters. As is said in the industry, "do not fall in love with your favorite model." The book covers equity models before moving to short-rate and other interest rate models. We cast these models for interest rate into the Heath-Jarrow-Morton framework, show relations between the different models, and explain a few interest rate products and their pricing. The chapters are accompanied by exercises. Students can access solutions to selected exercises, while complete solutions are made available to instructors. The MATLAB and Python computer codes used for most tables and figures in the book are made available for both print and e-book users. This book will be useful for people working in the financial industry, for those aiming to work there one day, and for anyone interested in quantitative finance. The topics that are discussed are relevant for MSc and PhD students, academic researchers, and for quants in the financial industry.

MyLab Math with Pearson EText -- Standalone Access Card -- Mathematical Ideas Oct 03 2020

Mathematics of Information and Coding May 22 2022 This book is intended to provide engineering and/or statistics students, communications engineers, and mathematicians with the firm theoretic basis of source coding (or data compression) in information theory. Although information theory consists of two main areas, source coding and channel coding, the authors choose here to focus only on source coding. The reason is that, in a sense, it is more basic than channel coding, and also because of recent achievements in source coding and compression. An important feature of the book is that whenever possible, the authors describe universal coding methods, i.e., the methods that can be used without prior knowledge of the statistical properties of the data. The authors approach the subject of source coding from the very basics to the top frontiers in an intuitively transparent, but mathematically sound, manner. The book serves as a theoretical reference for communication professionals and statisticians specializing in information theory. It will also serve as an excellent introductory text for advanced-level and graduate students taking elementary or advanced courses in telecommunications, electrical engineering, statistics, mathematics, and computer science.

Basic Mathematics for Engineers (8th Ed.) Aug 01 2020 This book provides a solid mathematical background for engineers, especially those working in telecommunications. Although it was originally written for officers in the U.S. Army's Telecommunications Systems Engineering Course (FA 24 TSEC) at Fort Gordon, Georgia, the broad and eclectic range of material and fully-explained exercises will make it a useful text not only for engineers but for anyone wanting to sharpen their mathematical skills or increase their knowledge.A variety of basic and more advanced topics are covered: exponential, logarithmic, and trigonometric functions; probability theory and random variables; matrix algebra; information theory and coding; wave theory; queueing theory; number theory and cryptography; and graph theory and algorithms. The book assumes the reader has some exposure to college mathematics (especially calculus), but it also includes a chapter on basic concepts (including high school math) and appendices reviewing differential and integral calculus.

Refining the Mathematics Knowledge Base Jul 20 2019 Understanding the knowledge that teachers must bring to their classrooms is critical to the advancement of the field of teacher education. Understanding how teacher knowledge impacts various aspects of teacher practice is also critical. Understanding the interplay between teacher knowledge and practice, and consequently the result that this relationship has on student learning is most important. This dissertation attempts to advance our collective understanding of the complex relationship between teacher knowledge, teacher practice, and student learning in the field of elementary mathematics. Four third-grade teachers were followed as they taught a subset of lessons in a unit on fractions. The study first investigates the types of knowledge that the teachers brought to their classrooms. Then, an examination is conducted of the way in which these types of knowledge impacted their teaching practice. Finally, the student learning that resulted over the course of these lessons is discussed. This study supports the widespread belief that teacher knowledge is important to instruction. The descriptions of the case study teachers highlight that their varying levels of knowledge resulted in unique aspects of practice being emphasized in their classrooms. This dissertation documents the differences in teaching practice and the trade-offs that produce differences in student learning. Interesting student learning patterns emerged, based on qualitative student interviews. Medium

students from classrooms in which teachers focused for more sustained periods on mathematical concepts seemed to demonstrate greater procedural fluency and deeper conceptual understanding than their peers in the other classrooms. Low students in classrooms where fluency was the focus seemed to show slightly greater procedural fluency, though less conceptual understanding, than their peers in the classrooms that spent more time on concepts. High students showed no appreciable difference across all classrooms. This study adds to the field by introducing a new construct, the conceptual threshold, to offer an explanation of these student learning trends.

Mathematical Methods in Computer Science Mar 20 2022 This Festschrift volume contains the proceedings of the conference Mathematical Methods in Computer Science, MMICS 2008, held December 2008, in Karlsruhe, Germany, in memory of Thomas Beth. The themes of the conference reflect his many interests.

Five More Golden Rules Oct 23 2019 "Casti is one of the great science writers." -San Francisco Examiner "Casti's gift is to be able to let the nonmathematical reader share in his understanding of the beauty of a good theory." -Christian Science Monitor Following up the acclaimed Five Golden Rules, another quintet of gleaming math discoveries With Five More Golden Rules, readers are treated to another fascinating set of theoretical gems from acclaimed popular science author John Casti. Injecting all-new ingredients into his trademark recipe of real-world examples, historical anecdotes, and straightforward explanations, Casti once again brings math to thrilling life. All who enjoyed the unique pleasures of the original will love this follow-up survey highlighting the creme de la creme of math in the last century. Explores how knot theory informs the classic tale of Alexander the Great and the Gordian Knot * Considers how the Shannon Coding Theory applies to decoding the human genome John L. Casti, PhD (Santa Fe, NM), a resident member of the Santa Fe Institute, is a professor at the Technical University of Vienna and the author of Would-Be Worlds (Wiley) and Cambridge Quintet.

A Mathematical Theory for Optimising Parallel Code Apr 09 2021

Introduction to the Theory of Error-Correcting Codes Sep 14 2021 A complete introduction to the many mathematical tools used tosolve practical problems in coding. Mathematicians have been fascinated with the theory oferror-correcting codes since the publication of Shannon's classicpapers fifty years ago. With the proliferation of communicationssystems, computers, and digital audio devices that employerror-correcting codes, the theory has taken on practicalimportance in the solution of coding problems. This solutionprocess requires the use of a wide variety of mathematical toolsand an understanding of how to find mathematical techniques tosolve applied problems. Introduction to the Theory of Error-Correcting Codes, Third Editiondemonstrates this process and prepares students to cope with codingproblems. Like its predecessor, which was awarded a three-starrating by the Mathematical Association of America, this updated andexpanded edition gives readers a firm grasp of the timelessfundamentals of coding as well as the latest theoretical advances.This new edition features: * A greater emphasis on nonlinear binary codes * An exciting new discussion on the relationship between codes andcombinatorial games * Updated and expanded sections on the Vashamov-Gilbert bound, vanLint-Wilson bound, BCH codes, and Reed-Muller codes * Expanded and updated problem sets. Introduction to the Theory of Error-Correcting Codes, Third Editionis the ideal textbook for senior-undergraduate and first-yeargraduate courses on error-correcting codes in mathematics, computerscience, and electrical engineering.

The Original Code in the Bible Jan 06 2021 A researcher who developed the code for biblical understanding called theomatics shows readers how a complex mathematical code found throughout the ancient writings provides proof of the existence of God. IP.

Cracking The Mental Math Code Aug 21 2019 From those who read a poster asking them to join the school's Number Sense team to the seasoned competitor eyeing SAT, State medals, this book serves as a guide and as inspiration, to not only pique interest but to build a foundation on. You'll find in this book a step-by-step guide on how-to solve Number Sense problems and prepare you for any mental math competitions. There are over 80 mental math techniques are explained in this book, and over 750 problems to learn, train, and improve with. Just a note: as fun as it is to learn new tricks and techniques on PEMDAS, Squares, GCD & LCM, Remainder, Higher Order Exponents, Roots, Primes & Divisors, Roman & Complex Numbers, Factorials & Combinations, Sequences, Memorization, Fractions, Decimals, Bases, Linear & Quadratic Equations, Sets, Logarithms, Matrices and many more. It's just as important to master them and implement them in full-length tests! I wish you all the best of luck, and happy computing!

Error Correction Coding Apr 21 2022 Providing in-depth treatment of error correction Error Correction Coding: Mathematical Methods and Algorithms, 2nd Edition provides a comprehensive introduction to classical and modern methods of error correction. The presentation provides a clear, practical introduction to using a lab-oriented approach. Readers are encouraged to implement the encoding and decoding algorithms with explicit algorithm statements and the mathematics used in error correction, balanced with an algorithmic development on how to actually do the encoding and decoding. Both block and stream (convolutional) codes are discussed, and the mathematics required to understand them are introduced on a "just-in-time" basis as the reader progresses through the book. The second edition increases the impact and reach of the book, updating it to discuss recent important technological advances. New material includes: Extensive coverage of LDPC codes, including a variety of decoding algorithms. A comprehensive introduction to polar codes, including systematic encoding/decoding and list decoding. An introduction to fountain codes. Modern applications to systems such as HDTV, DVBT2, and cell phones Error Correction Coding includes extensive program files (for example, C++ code for all LDPC decoders and polar code decoders), laboratory materials for students to implement algorithms, and an updated solutions manual, all of which are perfect to help the reader understand and retain the content. The book covers classical BCH, Reed Solomon, Golay, Reed Muller, Hamming, and convolutional codes which are still component codes in virtually every modern communication system. There are also fulsome discussions of recently developed polar codes and fountain codes that serve to educate the reader on the newest developments in error correction.

Practical Python AI Projects Feb 25 2020 Discover the art and science of solving artificial intelligence problems with Python using optimization modeling. This book covers the practical creation and analysis of mathematical algebraic models such as linear continuous models, non-obviously linear continuous models,and pure linear integer models. Rather than focus on theory, Practical Python AI Projects, the product of the author's decades of industry teaching and consulting, stresses the model creation aspect; contrasting alternate approaches and practical variations. Each model is explained thoroughly and written to be executed. The source code from all examples in the book is available, written in Python using Google OR-Tools. It also includes a random problem generator, useful for industry application or study. What You Will Learn Build basic Python-based artificial intelligence (AI) applications Work with mathematical optimization methods and the Google OR-Tools (Optimization Tools) suite Create several types of projects using Python and Google OR-Tools Who This Book Is For Developers and students who already have prior experience in Python coding. Some prior mathematical experience or comfort level may be helpful as well.

Coding the Matrix Oct 15 2021 An engaging introduction to vectors and matrices and the algorithms that operate on them, intended for the student who knows how to program. Mathematical concepts and computational problems are motivated by applications in computer science. The reader learns by doing, writing programs to implement the mathematical concepts and using them to carry out tasks and explore the applications. Examples include: error-correcting codes, transformations in graphics, face detection, encryption and secret-sharing, integer factoring, removing perspective from an image, PageRank (Google's ranking algorithm), and cancer detection from cell features. A companion web site, codingthematrix.com provides data and support code. Most of the assignments can be auto-graded online. Over two hundred

illustrations, including a selection of relevant xkcd comics. Chapters: The Function, The Field, The Vector, The Vector Space, The Matrix, The Basis, Dimension, Gaussian Elimination, The Inner Product, Special Bases, The Singular Value Decomposition, The Eigenvector, The Linear Program

Mathematics of the Incas Dec 25 2019 Unique, thought-provoking study discusses quipu, an accounting system employing knotted, colored cords, used by Incas. Cultural context, mathematics involved, and even how to make a quipu. Over 125 illustrations.

100 Mathematical Python Coding Exercises with Solutions Keys Aug 13 2021 The Math Python ebook arrived! This is a great ebook for middle school and high school teachers.It contains algebraic hands-on exercises in Python. Here are the 10 Chapters of this e-book: Chapter 1. Mean, mode, median, standard deviation, min/max, palindromes, FibonacciChapter 2. Probabilities, lists of numbers, sorting algorithms, specialized functionsChapter 3. Probabilities and lists of numbersChapter Chapter 4. General algebraic exercises: logs, sqrt, GCD, modulo, lists, factorials, permutations, golden ratioChapter Chapter 5. Linear equations Chapter Chapter 6. The quadratic equation Chapter 7. Frequency tables and histograms Chapter 8. Fractional and negative exponentsChapter 9. Exponential functions and geometrical progressionsChapter 10. Polynomials and operations with polynomialsThe objective of these problems is to prepare the students for a Data Science courses. The level is intermediate: the students have to have basic knowledge of coding in Python before approaching this material. The book can be used at different levels, depending on where your students are: middle school, high school and even college!Each problem contains: - the text of the problem- the Python code of two solutions: the procedural solution and the object oriented solutionFor teachers interested in a Word version of the book, that is available upon purchase

In Code Oct 27 2022 A self-portrait of the Irish mathematician describes how her love for mathematics led her to ground-breaking discoveries in Internet cryptography, making her the recipient of Young Scientist of the Year awards in Ireland and Europe.

Coding and Information Theory Nov 23 2019 This book is an introduction to information and coding theory at the graduate or advanced undergraduate level. It assumes a basic knowledge of probability and modern algebra, but is otherwise self- contained. The intent is to describe as clearly as possible the fundamental issues involved in these subjects, rather than covering all aspects in an encyclopedic fashion. The first quarter of the book is devoted to information theory, including a proof of Shannon's famous Noisy Coding Theorem. The remainder of the book is devoted to coding theory and is independent of the information theory portion of the book. After a brief discussion of general families of codes, the author discusses linear codes (including the Hamming, Golary, the Reed-Muller codes), finite fields, and cyclic codes (including the BCH, Reed-Solomon, Justesen, Goppa, and Quadratic Residue codes). An appendix reviews relevant topics from modern algebra.

Applying Math with Python Sep 21 2019

Crack the Code Feb 07 2021 CRACK THE CODE: Maths Mysteries for All Ages is packed with clever conundrums and ciphers for anyone interested in critical thinking, logical reasoning and mathematics, of course. Whether you are 11 or 41, you're going to love solving the 25 mysteries in this book that combine simple cryptology and arithmetic with some quick, out-of-the-box thinking. Use these innovative puzzle-based activities and stories to build problem-solving skills, remember maths concepts and practise mental maths in a way that's effective and, most importantly, interesting. Mathematics just became more fun!

Mathematical Objects in C++ Mar 28 2020 Emphasizing the connection between mathematical objects and their practical C++ implementation, this book provides a comprehensive introduction to both the theory behind the objects and the C and C++ programming. Object-oriented implementation of three-dimensional meshes facilitates understanding of their mathematical nature. Requiring no prerequisites, the text covers discrete mathematics, data structures, and computational physics, including high-order discretization of nonlinear equations. Exercises and solutions make the book suitable for classroom use and a supporting website supplies downloadable code.

Geometry and Codes Jan 18 2022 Approach your problems from the right end It isn't that they can't see the solution. It is and begin with the answers. Then one day. that they can't see the problem. perhaps you will find the final question. G. K. Chesterton. The Scandal of Father 'The Hermit Clad in Crane Feathers' in R. Brown 'The point of a Pin'. van Gulik's The Chinese Maze Murders. Growing specialization and diversification have brought a host of monographs and textbooks on increasingly specialized topics. However, the "tree" of knowledge of mathematics and related fields does not grow only by putting forth new branches. It also happens, quite often in fact, that branches which were thought to be completely disparate are suddenly seen to be related. Further, the kind and level of sophistication of mathematics applied in various sciences has changed drastically in recent years: measure theory is used (non-trivially) in regional and theoretical economics; algebraic geometry interacts with physics; the Minkowsky lemma, coding theory and the structure of water meet one another in packing and covering theory; quantum fields, crystal defects and mathematical programming profit from homotopy theory; Lie algebras are relevant to filtering: and prediction and electrical engineering can use Stein spaces. And in addition to this there are such new emerging subdisciplines as "experimental mathematics", "CFD", "completely integrable systems", "chaos, synergetics and large-scale order", which are almost impossible to fit into the existing classification schemes. They draw upon widely different sections of mathematics.

A Mathematical Approach to the Simple Bulls and Cows Code Breaking Game Nov 04 2020 Scientific Essay from the year 2015 in the subject Mathematics - Miscellaneous, language: English, abstract: This document describes the game of Bulls and Cows and the research previously done on it. We then proceed to discuss our simplified algorithm, which can be used practically by humans during course of play. An extended version of the algorithm, which leverages computational power to guess the code quickly and more efficiently, has also been explored. Lastly, extensive human trials have been conducted to study the effective- ness of the algorithm, and it has been shown that the algorithm results in a marked decrease in the average number of guesses in which a code is guessed by the code-breaker.

Lattices and Codes Feb 19 2022 The purpose of coding theory is the design of efficient systems for the transmission of information. The mathematical treatment leads to certain finite structures: the error-correcting codes. Surprisingly problems which are interesting for the design of codes turn out to be closely related to problems studied partly earlier and independently in pure mathematics. In this book, examples of such connections are presented. The relation between lattices studied in number theory and geometry and error-correcting codes is discussed. The book provides at the same time an introduction to the theory of integral lattices and modular forms and to coding theory. In the 3rd edition, again numerous corrections and improvements have been made and the text has been updated. Content Lattices and Codes -Theta Functions and Weight Enumerators - Even Unimodular Lattices - The Leech Lattice - Lattices over Integers of Number Fields and Self-Dual Codes. Readership Graduate Students in Mathematics and Computer Science Mathematicians and Computer Scientists About the Author Prof. Dr. Wolfgang Ebeling, Institute of Algebraic Geometry, Leibniz Universit ä t Hannover, Germany

Codes and Automata Jul 12 2021 This major revision of Berstel and Perrin's classic Theory of Codes has been rewritten with a more modern focus and a much broader coverage of the subject. The concept of unambiguous automata, which is intimately linked with that of codes, now plays a significant role throughout the book, reflecting developments of the last 20 years. This is complemented by a discussion of the connection between codes and automata, and new material from the field of symbolic dynamics. The authors have also explored links with more practical applications, including data compression and cryptography. The treatment remains self-contained: there is background material

on discrete mathematics, algebra and theoretical computer science. The wealth of exercises and examples make it ideal for self-study or courses. In summary, this is a comprehensive reference on the theory of variable-length codes and their relation to automata.

Math for Programmers Nov 16 2021 In Math for Programmers you'll explore important mathematical concepts through hands-on coding. Filled with graphics and more than 300 exercises and mini-projects, this book unlocks the door to interesting – and lucrative! – careers in some of today's hottest fields. As you tackle the basics of linear algebra, calculus, and machine learning, you'll master the key Python libraries used to turn them into real-world software applications. Summary To score a job in data science, machine learning, computer graphics, and cryptography, you need to bring strong math skills to the party. Math for Programmers teaches the math you need for these hot careers, concentrating on what you need to know as a developer. Filled with lots of helpful graphics and more than 200 exercises and mini-projects, this book unlocks the door to interesting – and lucrative! – careers in some of today's hottest programming fields. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Skip the mathematical jargon: This one-of-a-kind book uses Python to teach the math you need to build games, simulations, 3D graphics, and machine learning algorithms. Discover how algebra and calculus come alive when you see them in code! About the book In Math for Programmers you'll explore important mathematical concepts through hands-on coding. Filled with graphics and more than 300 exercises and mini-projects, this book unlocks the door to interesting – and lucrative! – careers in some of today's hottest fields. As you tackle the basics of linear algebra, calculus, and machine learning, you'll master the key Python libraries used to turn them into real-world software applications. What's inside Vector geometry for computer graphics Matrices and linear transformations Core concepts from calculus Simulation and optimization Image and audio processing Machine learning algorithms for regression and classification About the reader For programmers with basic skills in algebra. About the author Paul Orland is a programmer, software entrepreneur, and math enthusiast. He is co-founder of Tachyus, a start-up building predictive analytics software for the energy industry. You can find him online at www.paulor.land. Table of Contents 1 Learning math with code PART I - VECTORS AND GRAPHICS 2 Drawing with 2D vectors 3 Ascending to the 3D world 4 Transforming vectors and graphics 5 Computing transformations with matrices 6 Generalizing to higher dimensions 7 Solving systems of linear equations PART 2 - CALCULUS AND PHYSICAL SIMULATION 8 Understanding rates of change 9 Simulating moving objects 10 Working with symbolic expressions 11 Simulating force fields 12 Optimizing a physical system 13 Analyzing sound waves with a Fourier series PART 3 - MACHINE LEARNING APPLICATIONS 14 Fitting functions to data 15 Classifying data with logistic regression 16 Training neural networks

The BOOK of PHI, Volume 4 Dec 17 2021

Recent Trends in Coding Theory and Its Applications Mar 08 2021 Coding theory draws on a remarkable selection of mathematical topics, both pure and applied. The various contributions in this volume introduce coding theory and its most recent developments and applications, emphasizing both mathematical and engineering perspectives on the subject. This volume covers four important areas in coding theory: algebraic geometry codes, graph-based codes, space-time codes, and quantum codes. Both students and seasoned researchers will benefit from the extensive and self-contained discussions of the development and recent progress in these areas. Information for our distributors: Titles in this series are co-published with International Press, Cambridge, MA.

The Theory of Information and Coding Jun 23 2022 This is a self-contained introduction to the basics of the theory of information and coding.

Designs, Graphs, Codes and Their Links Jun 18 2019 This book demonstrates the connection between, and the applications of, design theory to graphs and codes. It is suitable as a textbook for advanced undergraduate students.