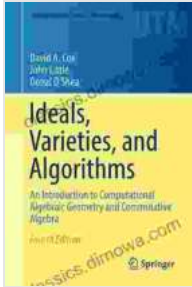


Ideals, Varieties, and Algorithms: Your Essential Guide to the Foundations of Computation



Ideals, Varieties, and Algorithms: An Introduction to Computational Algebraic Geometry and Commutative Algebra (Undergraduate Texts in Mathematics) by Arthur Taff

★ ★ ★ ★ ☆ 4.7 out of 5

Language : English

File size : 15622 KB

Screen Reader : Supported

Print length : 662 pages



In the realm of computer science and mathematics, ideals, varieties, and algorithms play a pivotal role in shaping our understanding of computation and its applications. This comprehensive guide will delve into the intricacies of these concepts, providing a solid foundation for researchers, students, and practitioners alike.

Ideals and Varieties

Ideals are fundamental algebraic structures that arise naturally in various mathematical contexts. An ideal in a ring is a subset of elements that behave like a vector space with respect to ring operations. Varieties, on the other hand, are geometric objects defined by polynomial equations. The study of ideals and varieties is closely intertwined, as ideals can be used to represent varieties and vice versa.

Algorithms for Ideals and Varieties

Algorithms play a crucial role in the practical manipulation of ideals and varieties. They enable us to compute properties, such as dimension, radical, and primary decomposition, efficiently. Efficient algorithms for these tasks are essential for applications in areas such as computational algebra, algebraic geometry, and cryptography.

Applications in Computer Science and Mathematics

The theory of ideals, varieties, and algorithms has far-reaching applications in computer science and mathematics. Some notable examples include:

- **Cryptography:** Ideals and varieties are used in public key cryptography to construct secure encryption and decryption algorithms.
- **Algebraic Geometry:** The study of varieties is central to algebraic geometry, which provides insights into the geometry of algebraic equations.
- **Computational Biology:** Ideals and varieties are used to analyze biological sequences and structures.
- **Geometric Modeling:** Varieties are employed in computer-aided design and manufacturing for representing complex geometric shapes.

Why Read This Book?

This book offers a comprehensive treatment of ideals, varieties, and algorithms, making it an invaluable resource for:

- **Computer Scientists:** Gain a deep understanding of the mathematical foundations of computation.

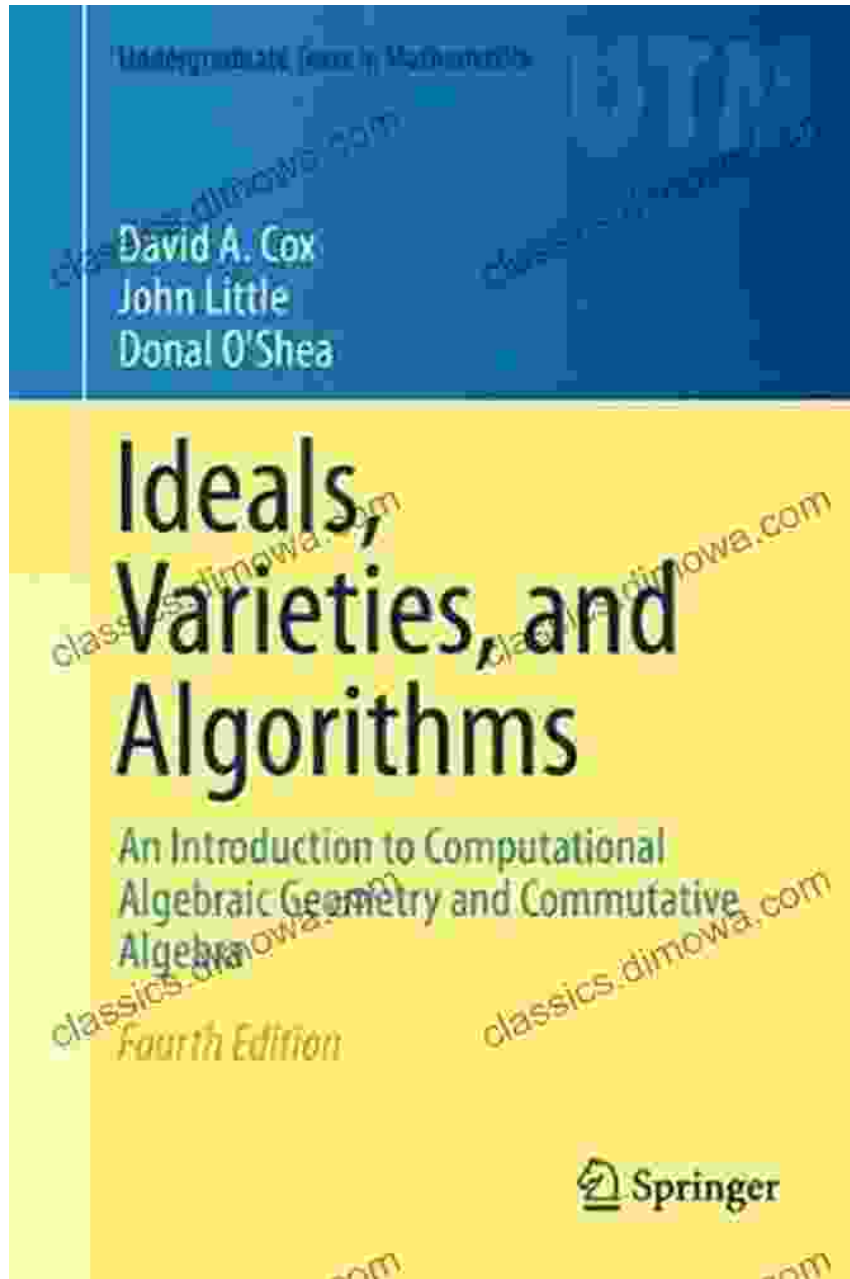
- **Mathematicians:** Enhance your knowledge of abstract algebra and algebraic geometry.
- **Researchers:** Access cutting-edge research in the fields of computational algebra and algebraic geometry.
- **Students:** Acquire a solid foundation for further study in computer science or mathematics.

Key Features

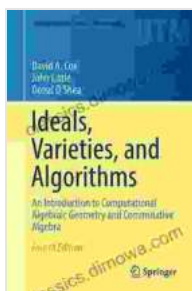
This book stands out from the crowd with its:

- **Comprehensive Coverage:** Detailed exposition of ideals, varieties, and algorithms, from basic concepts to advanced topics.
- **Rigorous Treatment:** Mathematically precise and rigorous presentation, ensuring the highest level of accuracy.
- **Numerous Examples:** Real-world examples illustrate abstract concepts and enhance understanding.
- **Exercises and Solutions:** Practice problems and worked-out solutions foster deeper comprehension.
- **Up-to-Date Research:** Inclusion of recent research findings keeps you at the forefront of the field.

Whether you are a seasoned researcher, a curious student, or an aspiring practitioner, this book is your indispensable guide to the world of ideals, varieties, and algorithms. Free Download your copy today and embark on an enlightening journey into the foundations of computation.



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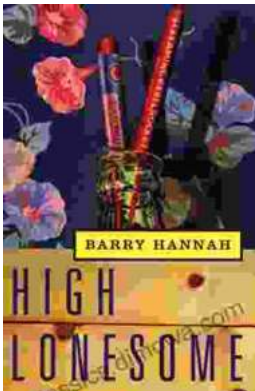
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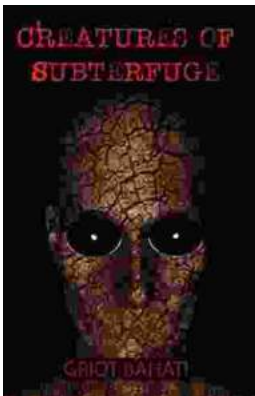
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