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Nota di contenuto	COMPUTING FOR NUMERICAL METHODS USING VISUAL C++; TRADEMARKS; CONTENTS; Preface; Codes for Download; 1. Modeling and Simulation; 1.1 Numerical Approximation; 1.2 C++ for Numerical Modeling; 1.3 Mathematical Modeling; 1.4 Simulation and Its Visualization; 1.5 Numerical Methods; 1.6 Numerical Applications; 2. Fundamental Tools for Mathematical Computing; 2.1 C++ for High-Performance Computing; 2.2 Dynamic Memory Allocation; 2.3 Matrix Reduction Problems; 2.4 Matrix Algebra; 2.5 Algebra of Complex Numbers; 2.6 Number Sorting; 2.7 Summary; Programming Challenges; 3. Numerical Interface Designs 3.1 Microsoft Foundation Classes3.2 Graphics Device Interface; 3.3 Writing a Basic Windows Program; 3.4 Displaying Text and Graphics; 3.5 Events and Methods; 3.6 Standard Control Resources; 3.7 Menu and File I/O; 3.8 Keyboard Control; 3.9 MFC Compatibility with .Net; 3.10 Summary; 4. Curve Visualization; 4.1 Tools for Visualization; 4.2 MyParser; 4.3 Drawing Curves; 4.4 Generating Curves Using MyParser;

4.5 Summary; Programming Challenges; 5. Systems of Linear Equations; 5.1 Introduction; 5.2 Existence of Solutions; 5.3 Gaussian Elimination Techniques; 5.4 LU Factorization Methods
 5.5 Iterative Techniques5.6 Visualizing the Solution: Code5; 5.7 Summary; Numerical Exercises; Programming Challenges; 6. Nonlinear Equations; 6.1 Introduction; 6.2 Existence of Solutions; 6.3 Bisection Method; 6.4 False Position Method; 6.5 Newton-Raphson Method; 6.6 Secant Method; 6.7 Fixed-Point Iteration Method; 6.8 Visual Solution: Code6; 6.9 Summary; Numerical Exercises; Programming Challenges; 7. Interpolation and Approximation; 7.1 Curve Fitting; 7.2 Lagrange Interpolation; 7.3 Newton Interpolations; 7.4 Cubic Spline; 7.5 Least-Squares Approximation; 7.6 Visual Solution: Code7
 7.7 SummaryNumerical Exercises; Programming Challenges; 8. Differentiation and Integration; 8.1 Introduction; 8.2 Numerical Differentiation; 8.3 Numerical Integration; 8.4 Visual Solution: Code8; 8.5 Summary; Numerical Exercises; Programming Challenges; 9. Eigenvalues and Eigenvectors; 9.1 Eigenvalues and Their Significance; 9.2 Exact Solution and Its Existence; 9.3 Power Method; 9.4 Shifted Power Method; 9.5 QR Method; 9.6 Visual Solution: Code9; 9.7 Summary; Numerical Exercises; Programming Challenges; 10. Ordinary Differential Equations; 10.1 Introduction
 10.2 Initial-Value Problem for First-Order ODE10.3 Taylor Series Method; 10.4 Runge-Kutta of Order 2 Method; 10.5 Runge-Kutta of Order 4 Method; 10.6 Predictor-Corrector Multistep Method; 10.7 System of First-Order ODEs; 10.8 Second-Order ODE; 10.9 Initial-Value Problem for Second-Order ODE; 10.10 Finite-Difference Method for Second-Order ODE; 10.11 Differentiated Boundary Conditions; 10.12 Visual Solution: Code10; 10.13 Summary; Numerical Exercises; Programming Challenges; 11. Partial Differential Equations; 11.1 Introduction; 11.2 Poisson Equation; 11.3 Laplace Equation; 11.4 Heat Equation
 11.5 Wave Equation

Sommario/riassunto

A visual, interdisciplinary approach to solving problems in numerical methods Computing for Numerical Methods Using Visual C++ fills the need for a complete, authoritative book on the visual solutions to problems in numerical methods using C++. In an age of boundless research, there is a need for a programming language that can successfully bridge the communication gap between a problem and its computing elements through the use of visual-ization for engineers and members of varying disciplines, such as biologists, medical doctors, mathematicians, economists, and politicians. This book takes