

Preface

The purpose of this book is to supply a collection of problems in introductory and advanced matrix problems together with their detailed solutions which will prove to be valuable to undergraduate and graduate students as well as to research workers in these fields. Each chapter contains an introduction with the essential definitions and explanations to tackle the problems in the chapter. If necessary, other concepts are explained directly with the present problems. Thus the material in the book is self-contained. The topics range in difficulty from elementary to advanced. Students can learn important principles and strategies required for problem solving. Lecturers will also find this text useful either as a supplement or text, since important concepts and techniques are developed in the problems.

A large number of problems are related to applications. Applications include wavelets, linear integral equations, Kirchhoff's laws, global positioning systems, Floquet theory, octonians, random walks, Kronecker product and images. A number of problems useful in quantum physics and graph theory are also provided. Advanced topics include groups and matrices, Lie groups and matrices and Lie algebras and matrices. Exercises for matrix-valued differential forms are also included.

The book can also be used as a text for linear and multilinear algebra or matrix theory. The material was tested in my lectures given around the world.

The International School for Scientific Computing (ISSC) provides certificate courses for this subject. Please contact the author if you want to do this course or other courses of the ISSC.

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