been mainly pedagogical, with emphasis on collecting ideas and methods of analysis in simple model situations, rather than on pursuing each approach to its limits. The notes thus summarize recent developments, and the reader is often referred to the literature for more complete results on a given topic. Because the formulation and analysis of Galerkin methods for parabolic problems are generally based on facts concerning the corresponding stationary elliptic problems, the necessary elliptic results are included in the text for completeness."

This book is not intended to be a guide for the practitioner on how to solve parabolic problems by Galerkin methods. Rather, it shows what a rigorous mathematical analysis can contribute to a qualitative understanding of the behavior of the errors as the mesh sizes become small. The material is presented in 14 more or less self-contained chapters. It includes results for the usual semidiscrete and fully discrete approximation, as well as for nonstandard discretizations, such as the discontinuous Galerkin method in time, the H^1- and H^{-1}-methods, and a mixed method. Special attention is focused on the case of nonsmooth initial data. Throughout, the objective is to find asymptotically "optimal" estimates of the discretization error in terms of the mesh sizes, under minimal assumptions on the smoothness of the solution.

The presentation is mathematically clear and easy to read. It clearly benefits from the fact that the author's own research has contributed to all of the topics discussed. His search for the most appropriate proof techniques results, for instance, in three different approaches to error estimates for semidiscrete Galerkin approximations.

The book is a welcome addition to the theoretically oriented literature on modern numerical methods for time-dependent problems, an area which is not yet very rich in monographs and textbooks.

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14[65G10].—H. RATSCHEK & J. ROKNE, *Computer Methods for the Range of Functions*, Ellis Horwood Series, Mathematics and its Applications, Wiley, New York, 1984, vi + 168 pp., 23 cm. Price $42.95.

This book deals with one of the most central problems in the mathematics of computation: finding the range of values of a function by efficient computational methods. This includes, for example, finding the global minimum and maximum over a given domain, and finding bounds on all sorts of expressions for errors in numerical methods.

The book is an up-to-date account of methods based on interval analysis and contains much original research by the authors. The centred form plays a large role, and many beautiful results are obtained by the authors for this useful tool.

There is no other comparable work in existence and this book should last as an indispensable reference for a long time to come. It is very clearly written and contains a wealth of information of use to anyone concerned with the mathematics of computation.

There are, as in almost any book, some misprints, most of which are obvious, such as the unions on the first page of the preface, which were meant to be intersections, as is made clear on the second page of the preface.

While the domains considered for the most part are simple, the methods can all, in principle, be extended to more complicated domains. Such a project must await another work, and this one will be the starting point for that.

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15[05–06].—WILLIAM R. PULLEYBLANK (Editor), *Progress in Combinatorial Optimization*, Academic Press, Toronto, 1984, xi + 374 pp., $23\frac{1}{2}$ cm. Price $47.00.

This volume contains 21 invited and contributed papers on combinatorial optimization presented in the summer of 1982 at an international conference at the University of Waterloo. They provide a useful cross section of the field up to the date of the conference.

W. G.