An Introduction to Project Modeling and Planning

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Abstract

This textbook teaches the basic concepts and methods of project management and explains how to convert them to valuable results in practice. Project management offers a promising working area for theoretical and practical applications and developing software and decision support systems (DSS). The focus here is specifically on project planning and control, with an emphasis on mathematical modeling. Models and algorithms establish a good starting point for students to study the relevant literature and support pursuing academic work in related fields. The book introduces theoretical concepts and provides detailed explanations, application examples, and case studies that deal with real-life problems. The chapters include questions that underlie critical thinking, interpretation, analytics, and making comparisons. Learning outcomes are defined, and the content of the book is structured following these goals. The chapter headings are as follows:

Chapter 1: Introduction to Project Modeling and Planning; Chapter 2: Organizing and Managing Projects; Chapter 3: Planning and Network Modeling of Projects; Chapter 4: Deterministic Project Scheduling with No Resource Constraints; Chapter 5: The Time/Cost Trade-off Problems; Chapter 6: Stochastic Project Scheduling with No Resource Constraints; Chapter 7: Resource Constrained Project Scheduling; Chapter 8: Resource Leveling and Other Resource Management Problems; Chapter 9: Project Contract Types and Payment Schedules; Chapter 10: Progress and Cost Control; Chapter 11: Project Risk Management; Chapter 12: Project Scheduling Under Uncertainty; Chapter 13: Planning and Scheduling of Repetitive Projects; Chapter 14: Project and Portfolio Selection; Chapter 15: Recent Developments and Some Promising Research Areas.