1. Record Nr. UNINA9910463331503321

Autore	Williams H. P
Titolo	Model building in mathematical programming [[electronic resource] /] / H. Paul Williams
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, 2013
ISBN	1-299-18870-2 1-118-50618-9 1-118-50617-0
Edizione	[5th ed.]
Descrizione fisica	1 online resource (433 p.)
Classificazione	519.7 WIL
Disciplina	519.7
Soggetti	Programming (Mathematics) Mathematical models Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and indexes.
Nota di contenuto	Cover; Title Page; Copyright; Contents; Preface; Part I; Chapter 1 Introduction; 1.1 The concept of a model; 1.2 Mathematical programming models; Chapter 2 Solving mathematical programming models; 2.1 Algorithms and packages; 2.1.1 Reduction; 2.1.2 Starting solutions; 2.1.3 Simple bounding constraints; 2.1.4 Ranged constraints; 2.1.5 Generalized upper bounding constraints; 2.1.6 Sensitivity analysis; 2.2 Practical considerations; 2.3 Decision support and expert systems; 2.4 Constraint programming (CP); Chapter 3 Building linear programming models; 3.1 The importance of linearity 3.2 Defining objectives3.2.1 Single objectives; 3.2.2 Multiple and conflicting objectives; 3.2.3 Minimax objectives; 3.2.4 Ratio objectives; 3.2.5 Non-existent and non-optimizable objectives; 3.3 Defining constraints; 3.3.1 Productive capacity constraints; 3.3.2 Raw material availabilities; 3.3.3 Marketing demands and limitations; 3.3.4 Material balance (continuity) constraints; 3.3.5 Quality stipulations; 3.3.6 Hard and soft constraints; 3.3.7 Chance constraints; 3.3.8 Conflicting constraints; 3.3.9 Redundant constraints; 3.3.10 Simple and generalized upper bounds; 3.3.11 Unusual constraints 3.4 How to build a good model3.4.1 Ease of understanding the model;

3.4.2 Ease of detecting errors in the model; 3.4.3 Ease of computing the solution; 3.4.4 Modal formulation; 3.4.5 Units of measurement; 3.5 The use of modelling languages; 3.5.1 A more natural input format; 3.5.2 Debugging is made easier; 3.5.3 Modification is made easier; 3.5.4 Repetition is automated; 3.5.5 Special purpose generators using a high level language; 3.5.6 Matrix block building systems; 3.5.7 Data structuring systems; 3.5.8 Mathematical languages; 3.5.8.1 SETs; 3.5.8.2 DATA; 3.5.8.3 VARIABLES; 3.5.8.4 OBJECTIVE 3.5.8.5 CONSTRAINTSChapter 4 Structured linear programming models; 4.1 Multiple plant, product and period models; 4.2 Stochastic programmes; 4.3 Decomposing a large model; 4.3.1 The submodels; 4.3.2 The restricted master model; Chapter 5 Applications and special types of mathematical programming model; 5.1 Typical applications; 5.1.1 The petroleum industry; 5.1.2 The chemical industry; 5.1.3 Manufacturing industry; 5.1.4 Transport and distribution; 5.1.5 Finance; 5.1.6 Agriculture; 5.1.7 Health; 5.1.8 Mining; 5.1.9 Manpower planning; 5.1.10 Food; 5.1.11 Energy; 5.1.12 Pulp and paper 5.1.13 Advertising5.1.14 Defence; 5.1.15 The supply chain; 5.1.16 Other applications; 5.2 Economic models; 5.2.1 The static model; 5.2.2 The dynamic model; 5.2.3 Aggregation; 5.3 Network models; 5.3.1 The transportation problem; 5.3.2 The assignment problem; 5.3.3 The transhipment problem; 5.3.4 The minimum cost flow problem; 5.3.5 The shortest path problem; 5.3.6 Maximum flow through a network; 5.3.7 Critical path analysis; 5.4 Converting linear programs to networks; Chapter 6 Interpreting and using the solution of a linear programming model; 6.1 Validating a model; 6.1.1 Infeasible models 6.1.2 Unbounded models

Sommario/riassunto

The 5th edition of Model Building in Mathematical Programming discusses the general principles of model building in mathematical programming and demonstrates how they can be applied by using several simplified but practical problems from widely different contexts. Suggested formulations and solutions are given together with some computational experience to give the reader a feel for the computational difficulty of solving that particular type of model. Furthermore, this book illustrates the scope and limitations of mathematical programming, and shows how it can be applied