



GLOBAL  
EDITION



# Operations Research

## *An Introduction*

TENTH EDITION

Hamdy A. Taha

 Pearson

# **Operations Research An Introduction**

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# Operations Research An Introduction

*Tenth Edition*  
*Global Edition*

Hamdy A. Taha  
*University of Arkansas, Fayetteville*



Pearson

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*To Karen*

Los ríos no llevan agua,  
el sol las fuentes secó . . .  
¡Yo sé donde hay una fuente  
que no ha de secar el sol!  
La fuente que no se agota  
es mi propio corazón . . .

— *V. Ruiz Aguilera (1862)*

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# What's New in the Tenth Edition

Over the past few editions, I agonized over the benefit of continuing to include the hand computational algorithms that, to my thinking, have been made obsolete by present-day great advances in computing. I no longer have this “anxiety” because I sought and received feedback from colleagues regarding this matter. The consensus is that these classical algorithms must be preserved because they are an important part of OR history. Some responses even included possible scenarios (now included in this edition) in which these classical algorithms can be beneficial in practice.

In the spirit of my colleagues collective wisdom, which I now enthusiastically espouse, I added throughout the book some 25 entries titled *Aha! moments*. These entries, written mostly in an informal style, deal with OR anecdotes/stories (some dating back to centuries ago) and OR concepts (theory, applications, computations, and teaching methodology). The goal is to provide a historical perspective of the roots of OR (and, hopefully, render a “less dry” book read).

Additional changes/additions in the tenth edition include:

- Using a brief introduction, inventory modeling is presented within the more encompassing context of supply chains.
- New sections are added about computational issues in the simplex method (Section 7.2.3) and in inventory (Section 13.5).
- This edition adds two new case analyses, resulting in a total of 17 fully developed real-life applications. All the cases appear in Chapter 26 on the website and are cross-referenced throughout the book using abstracts at the start of their most applicable chapters. For convenience, a *select number* of these cases appear in the printed book (I would have liked to move all the cases to their most applicable chapters, but I am committed to limiting the number of hard-copy pages to less than 900).
- By popular demand, all problems now appear at end of their respective chapters and are cross-referenced by text section to facilitate making problem assignments.
- New problems have been added.
- TORA software has been updated.



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# Acknowledgments

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Professor Michael Trick (Carnegie Mellon University) provided insightful arguments regarding the importance of continuing to include the classical (hand-computational) algorithms of yore in the book and I now enthusiastically share the essence of his statement that “[He] would not be happy to see the day when the Hungarian algorithm is lost to our textbooks.”

I wish to thank Professor Donald Erlenkotter (University of California, Los Angeles) for his feedback on material in the inventory chapters and Professor Xinhui Zhang (Wright State University) for his input during the preparation of the inventory case study. I also wish to thank Professors Hernan Abeledo (The George Washington University), Ali Diabat (Masdar Institute of Science and Technology, Abu Dhabi, UAE), Robert E. Lewis (University of Alabama, Huntsville), Scott Long (Liberty University), and Daryl Santos (Binghamton University) for pointing out discrepancies in the ninth edition and making suggestions for the tenth.

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It is a great pleasure to recognize Jack Neifert, the first acquisition editor with my former publisher Macmillan, who in 1972, one year after the publication of the first edition, predicted that “this is a book with a long life.” The tenth edition is an apt testimonial to the accuracy of Jack’s prediction.

I am grateful to Tamara Ellenbecker, Carrie Pennington, Matthew Sparks and Karen Standly, all of the University of Arkansas Industrial Engineering Department, for their able help (and patience) during the preparation of this edition.

My son Sharif, though a neuroscientist, has provided an insightful critique of the *Aha! moments* in this edition.

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# About the Author



**Hamdy A. Taha** is a University Professor Emeritus of Industrial Engineering with the University of Arkansas, where he taught and conducted research in operations research and simulation. He is the author of three other books on integer programming and simulation, and his works have been translated to numerous languages. He is also the author of several book chapters, and his technical articles have appeared in operations research and management science journals.

Professor Taha was the recipient of university-wide awards for excellence in research and teaching as well as numerous other research and teaching awards from the College of Engineering, all from the University of Arkansas. He was also named a Senior Fulbright Scholar to Carlos III University, Madrid, Spain. He is fluent in three languages and has held teaching and consulting positions in Europe, Mexico, and the Middle East.

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