

---

## **AIMMS Tutorial for Professionals - Introduction**

This file contains only one chapter of the book. For a free download of the complete book in pdf format, please visit [www.aimms.com](http://www.aimms.com)

Copyright © 1993–2011 by Paragon Decision Technology B.V. All rights reserved.

Paragon Decision Technology B.V.	Paragon Decision Technology Inc.	Paragon Decision Technology Pte.
Schipholweg 1	500 108th Avenue NE	Ltd.
2034 LS Haarlem	Ste. # 1085	80 Raffles Place
The Netherlands	Bellevue, WA 98004	UOB Plaza 1, Level 36-01
Tel.: +31 23 5511512	USA	Singapore 048624
Fax: +31 23 5511517	Tel.: +1 425 458 4024	Tel.: +65 9640 4182
	Fax: +1 425 458 4025	

Email: [info@aimms.com](mailto:info@aimms.com)  
WWW: [www.aimms.com](http://www.aimms.com)

AIMMS is a registered trademark of Paragon Decision Technology B.V. IBM ILOG CPLEX and sc CPLEX is a registered trademark of IBM Corporation. GUROBI is a registered trademark of Gurobi Optimization, Inc. KNITRO is a registered trademark of Ziena Optimization, Inc. XPRESS-MP is a registered trademark of FICO Fair Isaac Corporation. MOSEK is a registered trademark of Mosek ApS. WINDOWS and EXCEL are registered trademarks of Microsoft Corporation.  $\TeX$ ,  $\LaTeX$ , and  $\AMS-\LaTeX$  are trademarks of the American Mathematical Society. LUCIDA is a registered trademark of Bigelow & Holmes Inc. ACROBAT is a registered trademark of Adobe Systems Inc. Other brands and their products are trademarks of their respective holders.

Information in this document is subject to change without notice and does not represent a commitment on the part of Paragon Decision Technology B.V. The software described in this document is furnished under a license agreement and may only be used and copied in accordance with the terms of the agreement. The documentation may not, in whole or in part, be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form without prior consent, in writing, from Paragon Decision Technology B.V.

**Paragon Decision Technology B.V. makes no representation or warranty with respect to the adequacy of this documentation or the programs which it describes for any particular purpose or with respect to its adequacy to produce any particular result. In no event shall Paragon Decision Technology B.V., its employees, its contractors or the authors of this documentation be liable for special, direct, indirect or consequential damages, losses, costs, charges, claims, demands, or claims for lost profits, fees or expenses of any nature or kind.**

**In addition to the foregoing, users should recognize that all complex software systems and their documentation contain errors and omissions. The authors, Paragon Decision Technology B.V. and its employees, and its contractors shall not be responsible under any circumstances for providing information or corrections to errors and omissions discovered at any time in this book or the software it describes, whether or not they are aware of the errors or omissions. The authors, Paragon Decision Technology B.V. and its employees, and its contractors do not recommend the use of the software described in this book for applications in which errors or omissions could threaten life, injury or significant loss.**

This documentation was typeset by Paragon Decision Technology B.V. using  $\LaTeX$  and the LUCIDA font family.

**Part I**

---

**Introduction**

# Chapter 1

## Introduction

There are several ways in which you can learn the AIMMS language and acquire a basic understanding of its underlying development environment. The following opportunities are available.

*Ways to learn  
AIMMS ...*

- There are two *tutorials* on AIMMS to provide you with some initial working knowledge of the system and its language. One tutorial is intended for students, while the other is aimed at professional users of AIMMS.
- There is a *model library* with a variety of examples to illustrate simple and advanced applications together with particular aspects of both the language and the graphical user interface.
- There are three *reference books* on AIMMS, which are available in PDF format and in hard copy form. They are *The User's Guide* to introduce you to AIMMS and its development environment, *The Language Reference* to describe the modeling language in detail, and *Optimization Modeling* to enable you to become familiar with building models.
- There is a *Function Reference* that provides a detailed description of all available functions in AIMMS, including their arguments and return type. It also provides detailed information on predeclared identifiers available in AIMMS.
- There is an *Online Help* that provides many details on the usage of AIMMS. You can get online help for most of the tools, attribute forms and objects within the AIMMS system through the Context Help facilities.
- There are *workshops* on AIMMS that take you through the entire development cycle of a complete decision support application by means of a sequence of 'hands-on' sessions. For more information about the workshops refer to our site [www.aimms.com](http://www.aimms.com).

As a student studying optimization modeling, you may not have much time for learning yet another tool in order to finish some course work or homework requirements. In this case, concentrate your efforts on the tutorial for beginners. After completing that tutorial, you should be able to use the system to build your own simple models, and to enter your own small data sets for subsequent processing. The book on *Optimization Modeling* may teach you some useful tricks, and will show you different (mostly non-trivial) examples of optimization models.

*... for beginners*

As a professional in the field of optimization modeling you are looking for a tool that simplifies your work and minimizes the time needed for model construction and model maintenance. In this situation, you cannot get around the fact that you will need to initially invest substantial time to get to know several of the advanced features that will subsequently support you in your role as a professional application builder. Depending on your skills, experience, and learning habits you should determine your own individual learning path. Along this path you are advised to work through the extensive tutorial especially designed for professionals. This tutorial for professionals provides a good start, and should create excitement about the possibilities of AIMMS. Individual examples in the library, plus selected sections of the three books, will subsequently offer you additional ideas on how to use AIMMS effectively when building your own advanced applications.

*... for  
professionals*

The one-hour tutorial for students is designed as the bare minimum needed to build simple models using the AIMMS **Model Explorer**. Data values are entered manually using data pages, and a student can build a page with objects to view and modify the data. The extensive tutorial for professionals is an elaborate tour of AIMMS covering a range of advanced language features plus an introduction to all the building tools. Especially of interest will be the modeling of time using the concepts of horizon and calendar, the use of quantities and units, the link to a database, and the connection to an external DLL (Dynamic Link Library). Even then, some topics such as efficiency considerations (execution efficiency, matrix manipulation routines) and the AIMMS API (Application Programming Interface) will remain untouched.

*Tutorials are  
different in  
scope*

The current extensive tutorial for professionals requires a substantial amount of input. Several days are required to build the entire application from scratch. It is possible, however, to import portions of the model and its interface to adapt the tutorial to your own time restrictions.

*Several days are required ...*

This tutorial reads data from a database stored in MS Access format using ODBC (Open DataBase Connectivity). Therefore, you will need to have Microsoft Access on your machine in order to complete the course.

*... plus access to MS Access*

In this tutorial you will build your own end-user interface. One of the pages that you will construct is shown in Figure 1.1.

*Preview of your output*

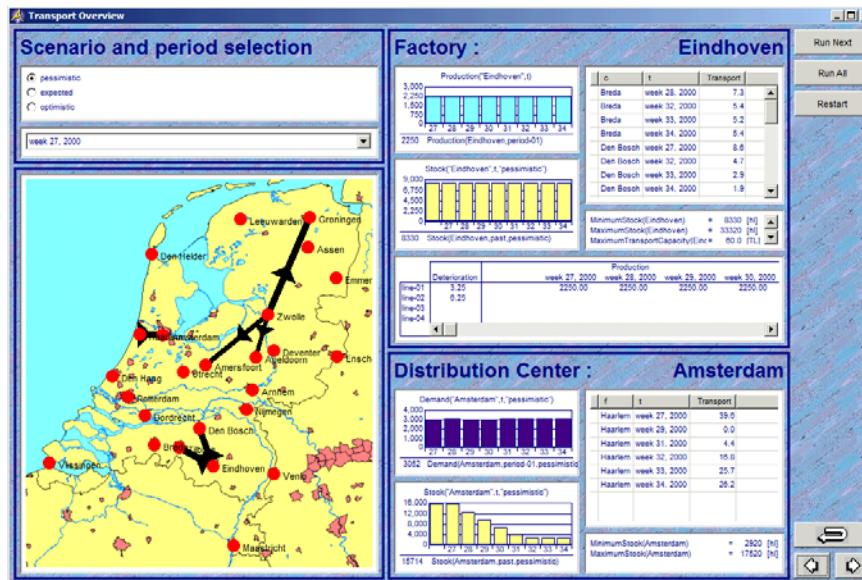


Figure 1.1: An overview of optimal transport data