*Practical Management Science*, 2e

Albright, Winston

1.      Introduction to Modeling

1.1.            Introduction

1.2.            A Waiting-Line Example

1.3.            Modeling Versus Models

1.4.            The Seven-Step Modeling Process

1.5.            Successful Management Science Applications

1.6.            Why Study Management Science?

1.7.            Software Included in this Book

1.8.            Conclusion

2.      Introductory Spreadsheet Modeling

2.1.            Introduction

2.2.            Basic Spreadsheet Modeling Concepts

2.3.            Modeling Examples

2.4.            Conclusion

Appendix: Tips for Editing and Documenting Spreadsheets

3.      Introduction to Optimization Modeling

3.1.            Introduction

3.2.            A Brief History of Linear Programming

3.3.            Introduction to LP Modeling

3.4.            Sensitivity Analysis and the SolverTable Add-In

3.5.            The Linear Assumptions

3.6.            Graphical Solution Method

3.7.            Infeasibility and Unboundedness

3.8.            A Multiperiod Production Problem

3.9.            A Decision Support System

3.10.        Conclusion

Appendix: Information on Solvers

4.      Linear Programming Models

4.1.            Introduction

4.2.            Static Workforce Scheduling Models

4.3.            Aggregate Planning Models

4.4.            Dynamic Workforce Planning Models

4.5.            Blending Models

4.6.            Production Process Models

4.7.            Dynamic Financial Models

4.8.            Data Envelopment Analysis (DEA)

4.9.            Conclusion

5.      Network Models

5.1.            Introduction

5.2.            Transportation Models

5.3.            More General Logistics Models

5.4.            Non-Logistics Network Models

5.5.            Project Scheduling Models

5.6.            Conclusion

6.      Linear Optimization Models with Integer Variables

6.1.            Introduction

6.2.            Approaches to Optimization with Integer Variables

6.3.            Capital Budgeting Models

6.4.            Fixed-Cost Models

6.5.            Lockbox Models

6.6.            Plant and Warehouse Location Models

6.7.            Set-Covering Models

6.8.            Models with Either-Or Constraints

6.9.            Cutting Stock Models

6.10.        Conclusion

7.      Nonlinear Optimization Models

7.1.            Introduction

7.2.            Basic Ideas of Nonlinear Optimization

7.3.            Pricing Models

7.4.            Sales Force Allocation Models

7.5.            Facility Location Models

7.6.            Rating Sports Teams

7.7.            Estimating the Beta of a Stock

7.8.            Portfolio Optimization

7.9.            Conclusion

8.      Evolutionary Solver: An Alternative Optimization Procedure

8.1.            Introduction

8.2.            Introduction to Genetic Algorithms

8.3.            Introduction to the Evolutionary Solver

8.4.            Nonlinear Pricing Models

8.5.            Combinatorial Models

8.6.            Fitting an S-Shaped Curve

8.7.            Portfolio Optimization

8.8.            Cluster Analysis

8.9.            Discriminant Analysis

8.10.        Conclusion

9.      Multi-Objective Decision Making

9.1.            Introduction

9.2.            Goal Programming

9.3.            Pareto Optimality and Trade-off Curves

9.4.            The Analytic Hierarchy Process

9.5.            Conclusion

10.  Decision Making Under Uncertainty

10.1.        Introduction

10.2.        Elements of a Decision Analysis

10.3.        More Single-Stage Examples

10.4.        Multistage Decision Problems

10.5.        Bayes’ Rule

10.6.        Incorporating Attitudes Toward Risk

10.7.        Conclusion

11.  Introduction to Simulation Modeling

11.1.        Introduction

11.2.        Real Applications of Simulation

11.3.        Generating Uniformly Distributed Random Numbers

11.4.        Simulation with Built-In Excel Tools

11.5.        Generating Random Numbers from Other Probability Distributions

11.6.        Introduction to @Risk

11.7.        Correlation in @Risk

11.8.        Conclusion

12.  Simulation Models

12.1.        Introduction

12.2.        Operations Models

12.3.        Financial Models

12.4.        Marketing Models

12.5.        Simulating Games of Chance

12.6.        Using TopRank with @Risk for Powerful Modeling

12.7.        Conclusion

13.  Inventory Models

13.1.        Introduction

13.2.        Categories of Inventory Models

13.3.        Types of Costs in Inventory Models

13.4.        Economic Order Quantity (EOQ) Models

13.5.        Probabilistic Inventory Models

13.6.        Ordering Simulation Models

13.7.        Supply Chain Models

13.8.        Conclusion

14.  Queueing Models

14.1.        Introduction

14.2.        Elements of Queueing Models

14.3.        The Exponential Distribution

14.4.        Important Queueing Relationships

14.5.        Analytical Models

14.6.        Queueing Simulation

14.7.        Conclusion

15.  Regression Analysis

15.1.        Introduction

15.2.        Scatterplots: Graphing Relationships

15.3.        Correlations: Indicators of Linear Relationships

15.4.        Simple Linear Regression

15.5.        Multiple Regression

15.6.        The Statistical Model

15.7.        Inferences About the Regression Coefficients

15.8.        Multicollinearity

15.9.        Modeling Possibilities

15.10.    Prediction

15.11.    Conclusion

16.  Time Series Analysis and Forecasting

16.1.        Introduction

16.2.        General Concepts

16.3.        Random Series

16.4.        The Random Walk Model

16.5.        Autoregression Models

16.6.        Regression-Based Trend Models

16.7.        Moving Averages

16.8.        Exponential Smoothing

16.9.        Deseasonalizing: The Ratio-To-Moving-Averages Method

16.10.    Estimating Seasonality with Regression

16.11.    Conclusion

Visit the [Cengage](http://www.cengage.com/decisionsciences/albright) site for our books.

Send e-mail to albright@indiana.edu

Albright is retired from the [Kelley School of Business, Indiana University, Bloomington](http://www.kelley.indiana.edu/) and now works as a consultant for [Palisade Corp](http://www.palisade.com/).

Back to [home page](file:///C%3A%5CUsers%5Cchris%5CDropbox%5CMy%20Books%5CWeb%20Site%5Cdefault.htm)

Updated: 1/13/2015