

Contents

1	Introduction	1
1.1	Overview of RM system	8
1.2	Chapter organization	12
1.3	Problems	13
2	Single-Resource Capacity Control	17
2.1	Capacity allocation problem	17
2.2	Two-class problem	24
2.3	Solution to two-class problem	37
2.4	Multi-class problem	60
2.5	Problems	84
3	Network RM	87
3.1	Introduction to network RM	87
3.2	Model formulation	95
3.3	Network control	99
3.4	Problems	119
4	Overbooking	121
4.1	Introduction to overbooking	121
4.2	Performance measures	123
4.3	Overbooking policies	134
4.4	Overbooking model variants	150
4.5	Problems	161
5	Price-Response Models	163
5.1	Demand function	163
5.2	Common demand models	167

5.3 Demand sensitivity	184
5.4 Problems	193
6 Price Optimization	197
6.1 Single-price optimization	197
6.2 Price differential	207
6.3 Other pricing models	219
6.4 Problems	226
7 Forecasting in RM	231
7.1 Demand forecasting	234
7.2 Forecasting for overbooking module	247
7.3 Selected estimation techniques in RM	255
7.4 Problems	271
Appendix	275
A Review of Undergraduate Probability Theory	275
A.1 Distribution functions	276
A.2 Special distributions	280
A.3 Conditional distributions	285
A.4 Selected proofs	289
A.5 Computer codes/commands	290
B Review of Point Processes	291
B.1 Poisson processes	291
B.2 Renewal processes	294
C Introduction to AMPL	299
D Solutions to Selected Exercises	307
E Statistical Tables	313
E.1 Poisson distribution	313
E.2 Binomial distribution	316
E.3 Standard normal distribution	318
F Bibliographic Notes	327
Bibliography	329
Index	335