

Contents

PREFACE	xv
PART ONE Principles of Good Database Design	1
CHAPTER 1 Introduction	3
1.1 Introduction	4
1.2 Defining a Decision Support System	5
1.3 Web-enabled Decision Support Systems	7
1.4 Decision Support System Applications	7
1.5 Textbook Overview	9
1.6 Summary	11
1.7 Exercises	12
CHAPTER 2 Introduction to Databases	13
2.1 Introduction	14
2.2 Data, Information, and Metadata	15
2.3 File-Based Approach	16
2.4 Database Approach	18
2.5 Database Development Process	23
2.6 Data Models	25
2.7 Summary	28
2.8 Exercises	29
CHAPTER 3 Entity-Relationship Modeling	33
3.1 Introduction	34
3.2 The Entity-Relationship Model	34
3.3 Entity	35
3.4 Attributes	36

3.5	Relationships	39
3.6	Degree of a Relationship	40
3.7	Cardinality of a Relationship	41
3.8	Unary Relationship	44
3.9	Binary Relationship	46
3.10	Ternary Relationships	49
3.11	Attributes of Relationships	51
3.12	Associative Entities	52
3.13	Weak Entity Types	54
3.14	Enhanced Entity-Relationship Modeling	55
3.15	Superclass, Subclass, and Relationships	56
3.16	Generalization and Specialization Process	60
3.17	Participation and Disjoint Constraints	63
3.18	Superclass/Subclass Hierarchy	66
3.19	Case Study: Conceptual Design for University Database	68
3.20	In-Class Assignment	69
3.21	Summary	69
3.22	Exercises	70

CHAPTER 4 Relational Data Modeling and Normalization 83

4.1	Introduction	84
4.2	The Relational Data Model	84
4.3	Relational Keys	86
4.4	Relational Data Integrity Constraints	89
4.5	Transforming E-R Diagrams into Relational Schemas	91
4.6	Case Study: Logical Design for a University Database	108
4.7	Introduction to Normalization	108
4.8	Data Redundancy	111
4.9	Database Anomalies	111
4.10	Functional Dependencies	113
4.11	Forms of Normalization	116
4.12	In-Class Assignment	122
4.13	Summary	122
4.14	Exercises	123

PART TWO Database Development with Microsoft Access 133

CHAPTER 5 Access Introduction: Touring Access 135

5.1	Introduction	136
5.2	The Architecture of Microsoft Access	136
5.3	Access's Development Environment	137
5.4	Exploring Tables	141
5.5	Relationships	143
5.6	Exploring Queries	144

5.7	Getting Access Help	146
5.8	Summary	148
5.9	Exercises	148
CHAPTER 6	Access Tables: Building Data Foundations	149
6.1	Introduction	150
6.2	Hands-On Tutorial: Creating Access Tables in the Datasheet View	151
6.3	Hands-On Tutorial: Creating Access Tables in the Design View	153
6.4	Field Data Types	154
6.5	Field Properties	155
6.6	The Lookup Wizard	161
6.7	Defining a Primary Key	164
6.8	Creating Access Tables by Using Import Wizard	165
6.9	Working with Table Properties	166
6.10	In-Class Assignment	167
6.11	Summary	167
6.12	Exercises	168
CHAPTER 7	Relationships: Linking Access Tables	175
7.1	Introduction	176
7.2	Defining Relationships in the Relationships Window	177
7.3	Types of Relationships	182
7.4	Hands-On Tutorial: Defining Relationships in Access	183
7.5	Working with Existing Relationships	184
7.6	In-Class Assignment	185
7.7	Summary	185
7.8	Exercises	185
CHAPTER 8	Queries: Building Application Foundations	189
8.1	Introduction	190
8.2	Working with Select Queries	191
8.3	Queries with Multiple Tables (The Join Operation)	197
8.4	Working with Operators	200
8.5	Hands-On Tutorial: A Select Query with Join of Multiple Tables	201
8.6	Using Total Row (The GroupBy Operation)	203
8.7	Creating Calculated Fields	206
8.8	Parameter Queries	208
8.9	Crosstab Queries	210
8.10	Action Queries	212
8.11	Update Queries	213
8.12	Delete Queries	216
8.13	Append Queries	218
8.14	In-Class Assignment	219
8.15	Summary	220
8.16	Exercises	220

CHAPTER 9	SQL: Creating and Processing RDBs	231
9.1	Introduction	232
9.2	Types of SQL Statements	232
9.3	The Data Definition Language (DDL)	233
9.4	The Data Manipulation Language (DML)	236
9.5	The SELECT Statement	236
9.6	The INSERT Statement	244
9.7	The DELETE Statement	245
9.8	The UPDATE Statement	245
9.9	Summary	246
9.10	In-Class Assignment	247
9.11	Exercises	247
 PART THREE Windows Application Development with VB .NET		 255
CHAPTER 10	Introduction to Visual Studio	257
10.1	Introduction	258
10.2	Exploring Visual Studio IDE	258
10.3	Visual Studio IDE Windows	261
10.4	Object-Naming Conventions	268
10.5	A Look at the VB .NET's Code Window	268
10.6	The Object Browser	271
10.7	In-Class Assignment	272
10.8	Summary	273
10.9	Exercises	273
CHAPTER 11	Visual Basic .NET Programming Language	275
11.1	Introduction	276
11.2	Visual Basic Statements	276
11.3	InputDialog and MessageBox	278
11.4	Visual Basic Data Types	282
11.5	Adding Windows Forms and Setting a Start-up Form	285
11.6	Control Structures	286
11.7	Arithmetic, Logical, and String Operators	300
11.8	Arrays	304
11.9	Multi-Dimensional Arrays	308
11.10	Dynamic Arrays	311
11.11	Code Debugging	312
11.12	In-Class Assignment	316
11.13	Summary	316
11.14	Exercises	317

CHAPTER 12	Objects and Procedures	321
12.1	Introduction	322
12.2	Procedures	322
12.3	Subroutine Procedures	324
12.4	Function Procedures	327
12.5	Visual Basic Modules	331
12.6	Visual Basic Classes	334
12.7	Navigating Through Application Forms	337
12.8	Exception Handling	338
12.9	In-Class Assignment	343
12.10	Summary	343
12.11	Exercises	344
CHAPTER 13	Windows Forms and Controls	349
13.1	Introduction	350
13.2	The Controls	350
13.3	The Label and LinkLabel Controls	353
13.4	The TextBox Control: In Depth	354
13.5	The Button Control	356
13.6	The CheckBox Control	357
13.7	The ListBox Control: In Depth	359
13.8	The ComboBox Control	361
13.9	The CheckedListBox Control	363
13.10	The DateTimePicker Control	366
13.11	The TreeView Control	368
13.12	Arranging Controls on a Form	369
13.13	The Start-up Object	370
13.14	In-Class Assignment	371
13.15	Summary	371
13.16	Exercises	372
CHAPTER 14	Database Connectivity with ADO .NET	377
14.1	Introduction	378
14.2	Database Applications Overview	378
14.3	Hands-On Tutorial: Creating a Simple Database Application	380
14.4	Auto-Generated Objects in the Component Tray	387
14.5	Hands-On Tutorial: Displaying Data in Individual Windows Controls	388
14.6	Hands-On Tutorial: Binding Data to Existing Controls	391
14.7	Hands-On Tutorial: Displaying Related Data on a Windows Form	392
14.8	DataGridView Control	396
14.9	Hands-On Tutorial: Creating a Search Form	398
14.10	The Query Builder	403
14.11	Hands-On Tutorial: Creating a Lookup Table	403

14.12	Data Binding Properties of a ComboBox Control	406
14.13	In-Class Assignment	406
14.14	Summary	407
14.15	Exercises	407
CHAPTER 15	Advance Topics in Database Connectivity	411
15.1	Introduction	412
15.2	ADO .NET Architecture	412
15.3	A Database Connection	413
15.4	Hands-On Tutorial: Displaying Data on a Form with Multiple Parameters	417
15.5	Hands-On Tutorial: Displaying Data on a Form from Join of Multiple Tables	423
15.6	Hands-On Tutorial: Displaying Data Using Existing MS Access Query	426
15.7	Hands-On Tutorial: Passing Data between Forms in a Windows Application	428
15.8	DataSets	432
15.9	Inserts, Updates, and Deletes in a Windows Application	435
15.10	Hands-On Tutorial: Updating Changes to Multiple Tables in the Database	440
15.11	In-Class Assignment	443
15.12	Summary	443
15.13	Exercises	444
CHAPTER 16	Crystal Reports	447
16.1	Introduction	448
16.2	Crystal Report Primer: A Simple Student Report	449
16.3	Crystal Report Sections	460
16.4	Customizing Reports: Exploring the Design Environment	461
16.5	Properties of a CrystalReportViewer Control	463
16.6	Hands-On Tutorial: Creating a Pie Chart to Display Faculty Salaries	464
16.7	Hands-On Tutorial: Creating a Crystal Report Based on Multiple Tables	467
16.8	Hands-On Tutorial: Creating Parameterized Crystal Reports	472
16.9	In-Class Assignments	476
16.10	Summary	476
16.11	Exercises	476
PART FOUR	Web Application Development with ASP .NET	479
CHAPTER 17	Web Introduction and Essential HTML	481
17.1	Introduction	482
17.2	Internet, Web, and Related Terminologies	482
17.3	HyperText Markup Language (HTML)	484
17.4	Essential Text Formatting	487

17.5	HTML Hyperlinks	493
17.6	Page Backgrounds	494
17.7	Adding Graphics to Web Pages	495
17.8	Structuring Web Pages Using HTML Tables	496
17.9	Using Visual Studio's Design View: WYSIWYG	498
17.10	Web Form and HTML Controls	499
17.11	In-Class Assignments	502
17.12	Summary	503
17.13	Exercises	503
CHAPTER 18	Introduction to ASP .NET	505
18.1	Introduction	506
18.2	ASP.NET Primer: Sum of N Numbers	506
18.3	Hands-On Tutorial: Currency Conversion Example	509
18.4	Extending the Currency Conversion Example— The <i>AutoPostBack</i> Property	511
18.5	Using the <i>Page_Load</i> Event and <i>IsPostBack</i> Property	515
18.6	Working with the Page Directive	517
18.7	Validation Controls	518
18.8	Passing Parameters through URL	522
18.9	User-Defined Controls	523
18.10	In-Class Assignments	527
18.11	Summary	527
18.12	Exercises	528
CHAPTER 19	Database Connectivity in Web Applications	531
19.1	Introduction	532
19.2	Connecting to the Access Database Using the Server Explorer Window	532
19.3	Hands-On Tutorial: Displaying Data on a Web Page	535
19.4	Reconfiguring SQL Query in an <i>AccessDataSource</i>	536
19.5	Paging, Sorting, and Data Manipulation in a <i>GridView</i> Control	540
19.6	Hands-On Tutorial: Displaying Data on a Web Page from a Query with a Join of Multiple Tables	542
19.7	Hands-On Tutorial: Displaying Data-Bind Images in a <i>GridView</i> Control	545
19.8	Hands-On Tutorial: Adding Lookup and Filter Functionalities to a Web Page	548
19.9	Hands-On Tutorial: Displaying Related Data in a <i>DetailsView</i> Control	552
19.10	Hands-On Tutorial: Working with the <i>Repeater</i> Control	557
19.11	Web-Based Crystal Reports	560
19.12	Programmatically Accessing the Database	567
19.13	In-Class Assignment	569
19.14	Summary	570
19.15	Exercises	570

PART FIVE	Case Studies	573
CASE STUDY 1	Online Book Store	575
CS1.1	Introduction	576
CS1.2	Application Functionalities and Assumptions	576
CS1.3	The Master Page	578
CS1.4	The Index Page	580
CS1.5	The Shopping Cart Page	589
CS1.6	The Login Page	595
CS1.7	The Checkout Page	595
CS1.14	Summary	598
CS1.15	Extensions	598
CASE STUDY 2	Portfolio Management and Optimization	599
CS2.1	Introduction	600
CS2.2	Application Functionalities and Assumptions	600
CS2.3	The Master Page	602
CS2.4	The Index Page	604
CS2.5	The Personal Information Page	604
CS2.6	The Stock Comparison Page	606
CS2.7	The Portal Page	609
CS2.8	Portfolio Operations	610
CS2.9	The Optimization Page	615
CS2.10	Summary	620
CS2.11	Extensions	620
CASE STUDY 3	Television Advertisement Allocation	621
CS3.1	Introduction	622
CS3.2	Application Functionalities	623
CS3.3	The Channel Information and Program Information Pages	624
CS3.4	The Customer Preferences Form	632
CS3.5	The Advertisement Allocation Page	633
CS3.6	Summary	636
CS3.7	Extensions	636
CASE STUDY 4	Voyage Prophecy	639
CS4.1	Introduction	640
CS4.2	Application Functionalities	640
CS4.3	The Startup Form, User Controls, and MapPoint Reference	641
CS4.4	The Search Form	645
CS4.5	The Show Map Form	647
CS4.6	The Drivelt Form	650
CS4.7	The Direction Form	651
CS4.8	Summary	652
CS4.9	Extensions	653

CASE STUDY 5	ADO .NET and MS Excel	655
CS5.1	Introduction	656
CS5.2	Forecasting Methods: Background and Theory	656
CS5.3	Forecasting Methods: Application Functionalities and Assumptions	658
CS5.4	Setting up the Parameter Input Form and the Excel Sheet	658
CS5.5	The Code Behind the Parameter Input Form	661
CS5.6	Dynamic Production Problem (DPP) Application	666
CS5.7	DPP: Setting up the Parameter Input Form and the Excel Sheet	667
CS5.8	DPP: The Code Behind the Parameter Input Form	669
CS5.9	Summary	674
CS5.10	Application Extensions	674
	REFERENCES	675
	ABOUT THE AUTHORS	677
	INDEX	679