

Index

A

Access
queries, 10, 146, 191, 212, 220, 426–7
query
design view, 403
types, 190, 236
table design, 141
tables, 10, 133, 136, 150, 426
Access Data Object, 136–7, 148
Access database, 136–8
table, 267, 532, 658, 661
Access DBMS, 10, 20, 136
Access Relationships Window, 177
Access Update, 593
Access window, 136–8, 147, 152
AccessDataSource, 544–7
Access's Database Window, 136
Access's Development Environment,
135, 137, 139
Access's query Design View, 192
Access's Relationships Window, 176
Action queries, 144, 148, 189–91, 212,
215, 219–21
Active Server Pages, 4, 506
Add Connection, 384, 414–5, 533
Add New Item, 285, 334, 450, 464, 486,
509, 511, 518, 560, 578, 580, 628
Add Query option, 399, 420, 473
Add Reference, 643–4, 663
Add Table, 424, 543
Adding
calculated fields, 191
query tables, 424
Adding User Control, 525
Adding Validation Controls, 518
Adding Web controls, 508

Aggregate functions, 203–5, 242–3, 246,
464, 476, 571
Anomalies, 93, 111, 113, 116, 118, 120,
143, 197
Application
development process, 261, 273, 281,
301, 385
forms, 321, 337, 343, 378, 642, 649,
653
Arranging Controls, 349, 369
Array size, 304, 311, 343
Arrays, 10, 283, 304–5, 308
multidimensional, 310, 317, 319–20
one-dimensional, 308
static, 311, 316
two-dimensional, 308–10
ASP tag, 536, 540, 545, 552, 625
ASP Web page, 507
ASP.NET, 502, 517, 676
Associative entity, 49, 52–3, 55, 69, 70,
106
Attribute inheritance, 56, 58, 63, 69
Attributes, 26, 34, 36–7, 71–2, 113–4,
118, 122, 152, 176, 233, 263, 490,
495
derived, 37, 69, 70, 206
discriminating, 65
of entities, 34
naming, 36
of Relationships, 33, 51
required, 56
simple, 37, 70, 91–2
single-valued, 37
stored, 37, 70
subclass discriminator, 104
unique, 57–8, 69, 71, 82

AutoNumber
data types, 154–6, 168
and Number data type, 181
AutoPostBack Property, 505, 511,
513–5, 527–8, 549–50
AVG, 242, 247–8
B
BackColor property value, 352
Background attribute, 494
BCNF, 109–10, 116, 120–2, 126
Binary
many-to-many relationship, 47, 97,
100
one-to-many relationships, 47, 49,
97–9
relationships, 41, 46, 49, 52–3
Binding, 386, 397, 406
Binding Windows controls, 380, 387, 407
BindingNavigator control, 387
BindingSource
objects, 387, 395–7, 406, 413, 428,
434, 442
and TableAdapter object, 435
Body, 494, 503
tags, 488–9, 494
Boolean
condition, 293
value, 303
Bound Column, 164
Boyce-Codd normal form, 109, 120–1
Breakpoints, 313–4, 316
Browser, 482–4, 488, 493, 495, 503, 588
Button control, 269, 279, 325, 350, 356,
372, 438, 474, 500, 514
Bytes, 154–5, 282

C

- Calendar controls, 637
 - Candidate key, 86–9, 110, 114, 120–3
 - Cartesian product, 200, 239
 - Cascade Delete, 181–2, 185–6, 221
 - Cascade Update, 182, 185, 216
 - Char value, 355
 - Chart object, 461–3, 465, 470, 472, 666
 - Chart Options, 456–7, 462, 465, 470
 - CheckBox Control, 303, 350, 357, 363, 372, 504
 - CheckBox and RadioButton controls, 372
 - Checked
 - items, 364–5, 591
 - property, 289–90, 303, 357–8
 - CheckedItems collection, 365
 - CheckBoxList Control, 349–50, 363–5, 372
 - Code Debugging, 275–6, 312–3, 315
 - Color
 - attributes, 491
 - property, 525–7
 - Column
 - constraints, 234
 - data types, 152
 - names, 142, 151–2, 234–5, 434, 559
 - Columns
 - named, 27, 84, 659
 - primary key-foreign key, 199
 - ComboBox control, 350, 361–4
 - ComboBox's ValueMember, 406
 - Component tray, 377, 385, 387
 - Composite
 - attribute, 37–8, 52, 70–1, 91–2, 122, 125
 - key, 37–8, 93, 123, 127, 130–1
 - Concat function, 303
 - Conceptual database modeling, 23, 28
 - Concurrency Control and Recovery Services Concurrency, 21
 - Conditions, primary key-foreign key, 199
 - Configure Data Source option, 537, 543, 546, 548
 - Configure Data Source Wizard, 536–7, 540, 543–4, 546, 548, 550–1, 553
 - Configure TableAdapter objects, 380
 - Connection
 - object, 379–80, 407, 412–3, 416–7, 443–4, 608
 - string, 383–4, 414–6
 - Constants, 276, 278, 316
 - Constructor, 335–6, 344
 - Control
 - class, 352
 - flow, 269
 - objects, 263, 274, 670
 - structures, 286–9, 291, 293, 295, 297, 299, 316–7
 - Controls
 - background color Check Box, 528
 - binding, 387, 389, 413, 432, 435
 - data-driven, 569
 - field properties, 167
 - input, 671–2
 - key, 350
 - map, 652
 - multiple, 369
 - navigational, 384
 - selected, 369, 391
 - table properties, 167
 - up-down, 366
 - validating, 527
 - Count function, 211
 - Create Query in Design View, 145
 - Create query options, 193
 - Creating Access Tables, 149, 151, 153, 165
 - Creating Calculated Fields, 189, 206–7
 - Creating Parameterized Crystal Reports, 447, 472–3, 475
 - Criteria
 - row, 195–7, 201, 207, 209, 211, 217
 - user-specified, 420
 - Crosstab queries, 144, 210–2, 220–5, 227–9, 624–5, 627–8, 631
 - Crystal Report Primer, 447, 449, 451, 453, 455, 457, 459
 - Crystal Report Wizard, 629–30
 - Crystal Reports Gallery, 450–2, 464, 469, 561
 - Crystal-ReportViewer control, 447, 463, 473
 - CrystalReportSource Control, 564–5
 - Currency data type, 155–6, 168
 - Customizing Reports, 447, 461
- D**
- Data
 - modeling, record-based relational, 84
 - models, 13, 25–9, 34, 69
 - entity-relationship, 26, 28, 183
 - record-based, 26, 28–9
 - relation-based, 34
 - objects, 136, 138–9, 148
 - page, 452, 464, 561, 629
 - processing, simple, 7
 - provider drop-down list, 382
 - redundancies, 93, 109, 111–2, 116, 120, 143, 190, 197
 - rows, 144, 432–3, 435
 - source, 212, 381, 391, 396, 398, 413–5
 - type conversion, 283–4
 - types, 89, 143, 154–5, 201, 234, 277, 282, 284–5, 304
 - default, 152, 155
 - lookup, 155, 161
 - user-defined, 334
 - Data Definition Language, 231–3, 235–6, 246
 - Data attributes, 30–1
 - Data-bind ImageField, 546
 - Data binding, 379, 390–2, 396–7, 413
 - properties, 377, 390, 396, 403, 405–7
 - Data Connections, 382, 414, 533, 561
 - Data field, 24–5, 144, 150, 153, 155
 - properties, 143
 - selected, 143
 - Data-GridView control, 310, 388, 408
 - Data Source Configuration Wizard, 381, 384, 391, 412–5, 418, 433, 450, 549, 558
 - Data source drop-down list, 549
 - Data Sources Configuration Wizard, 381, 432–3
 - Data Sources Window, 380–1, 389, 391–3, 403–4, 407, 412–8, 423, 425–8, 432, 437, 444, 450, 468
 - Data structures, 84, 122, 617
 - Data Table, 425, 430, 432, 435, 468, 661
 - DataAdapter objects, 412–3, 568–9
 - Database
 - approach, 13–4, 18–9, 21–3, 29
 - connection, 267, 413–5, 443–4, 450, 532–3, 537, 569
 - setting, 594
 - design, 10, 25, 34, 93, 252, 258, 576, 675
 - conceptual, 26, 34, 91
 - physical, 28, 84, 677
 - process, 9
 - relational, 111
 - developers, 408, 448
 - entry, 612
 - field values, 201, 213, 451
 - files
 - compacting, 147
 - compress, 147

- export, 140
 - implementation, 34
 - index, 157, 233
 - management system, 7, 15, 18–9, 21–2, 28
 - normalization, 84
 - personnel, 15
 - programming, 532
 - language, 10–1
 - schemas, 25–6, 29, 143
 - systems, 16, 18–23, 28–9, 78, 81, 675
 - toolbar, 139–40, 160, 164
 - Database administrator, 18–21, 28
 - Database Anomalies, 83, 111
 - Database application development, 258, 378, 380, 384, 407, 675
 - Database Applications Overview, 377–9
 - Database View, 138–9, 141, 145, 193
 - Database Window, 137–8, 142, 145
 - DataColumns, 432–3, 443
 - DataGridView control, 309–10, 381, 384
 - DataGridView Control Properties, 398
 - DataMember property, 387, 395, 397
 - DataRelations object, 396, 432
 - DataRow, 432–4, 436, 439, 444
 - DataSet Designer, 380, 417–20, 422–3, 425, 430, 468, 473, 628
 - DataSet object, 379–80, 387, 413
 - Datasheet View, 141–2, 145, 150–1, 190, 195
 - DataSource property, 386, 395–7, 404–5, 408, 568
 - DataTable objects, 386–7, 403, 418, 432–7, 439, 443–4, 468
 - DataTextField property, 550
 - DataValueField property, 550
 - Date field, 24–5, 201
 - DateTimePicker Control, 349–51, 366–7, 372, 444
 - DBMS, 7, 10, 18–21, 148, 378, 532
 - DCL, 232–3, 246
 - DDL statements, 231–3, 235–6, 246
 - Debug, 258, 261, 266, 313–4
 - Decision
 - structures, 286–7, 316
 - support systems, 4–6, 9, 11–2, 200, 622, 675–7
 - Default values, 158, 235, 274, 280, 336
 - Defining relationships in Access, 175, 183
 - Degree of relationships, 34
 - Delete Queries, 189, 217, 219
 - Deleting Relationships, 184
 - Deletion anomalies, 111, 113, 116, 120, 122
 - Demand values
 - forecasted, 657
 - historical, 658
 - Design Environment, 447, 458, 461
 - Design Grid, 143, 146, 153, 194–5, 266, 403
 - Design View and Simple Query Wizard, 192
 - Design Window, 259, 273
 - of Visual Studio IDE, 534
 - Designer window and TableAdapter Configuration Wizard, 628
 - DetailsView ASP tag, 555
 - DetailsView Control, 552–7, 568–71, 605, 623–4, 626, 631
 - Disadvantages of Database approach, 22
 - Disjoint constraints, 33–4, 63–6, 70
 - Display
 - data-bind images, 546
 - lookup value, 163
 - property, 519–20, 528
 - reports, 476
 - text, 351, 463
 - value field, 163
 - Display Member Set, 406
 - DisplayGroupTree, 463
 - property, 466, 471
 - Displaying Data
 - in Individual Windows Controls, 377, 388–9
 - on
 - Web page, 11
 - Windows form, 379–80, 443
 - Displaying Data-Bind Images, 531, 545, 547
 - Displaying Data Using Existing, 411, 426–7
 - Displaying Text Data, 487
 - DisplayMember property, 359, 361, 403–6
 - DisplayToolBar, 463
 - DML statements, 231–3, 236–7, 244–6
 - Do-Loop structures, 293, 295, 297–9
 - Do-Loop-Until, 293, 296, 318
 - Do-Loop-While, 293, 318
 - Do-Until-Loop, 293, 296, 318
 - Do-While-Loop, 293
 - Domain, 9, 14, 85, 89
 - Draw referential integrity arrows, 96
 - DropDownList and AccessDataSource tags, 550
 - DropDownList ASP tag, 550
 - DropDownList control, 361, 548–52, 566–9, 581–2, 591
 - changed, 591
 - column, 589
 - and Keyword TextBox, 581
 - value, 591
 - DSS, 4–9, 11, 622, 677
 - applications, 5–8, 11–2
 - Duplicate, 17, 94, 96, 160
 - Dynamic arrays, 311, 340–1, 347
- ## E
- Edit Fields option, 555
 - Edit Items option, 512
 - Edit queries in DataSet Designer option, 417
 - Edit Relationships, 177, 179–85
 - Enforce Referential Integrity, 180
 - Enhanced entity-relationship diagram, 34
 - Enhanced Entity-Relationship Modeling, 33, 55
 - Enhanced Entity-Relationships, 56, 58, 69, 103
 - Entities
 - associated, 52–4
 - instances of, 41–3, 69
 - subclass, 56, 58–9, 63, 69, 103–4
 - weak, 55, 70, 105–6, 125
 - Entity
 - constraints, 89, 90, 122
 - instances, 35, 37–8, 45, 47, 49, 69, 70
 - sets, 35, 37, 40, 43, 69
 - subtypes, 71, 81–2
 - types, 35–7
 - associated, 37
 - common, 36
 - regular, 91
 - strong, 54–5, 69, 70, 105
 - weak, 33–4, 54–5, 69, 70, 105
 - Entity-Relationship Modeling, 33
 - ErrorPage, 517
 - Essential Text Formatting, 481, 487, 489, 491
 - Eval function, 559–60
 - Event
 - handlers, 233, 246, 517, 528, 626, 661, 669
 - subroutine, 270, 591, 646
 - Events, default, 269–70

- Evolution of Database systems, 21
 - Excel, 155, 165, 659, 663–4, 677
 - application, 663, 669, 672–3
 - charts, 656, 658, 661, 666, 674
 - file, 165, 659–61, 663, 666, 674
 - functions, 656, 658–9, 661, 664, 674
 - objects, 656, 663, 666, 674
 - Excel Sheet, 165, 658–9, 661, 664, 666–8, 672–3
 - Excel Solver, 656, 666, 668–9, 673–4
 - Excel spreadsheet, 656, 658, 661, 674
 - Exception Handling, 321, 338–9, 341
 - Exceptions, 338–41, 343–4, 367, 437, 439
 - run-time, 313, 317, 322
 - Execute database queries, 380
 - Execute Query, 400, 403, 544
 - Expert Wizard, 448, 451, 456, 461, 463, 476, 563
 - Exploring Database Tables, 534
 - Exploring Query Toolbar and Menu, 197
 - Exploring Relationships Toolbar and Menu, 178
 - Exploring Tables, 135, 141
 - Exploring Visual Studio, 257–9
 - Expression Builder, 159, 197, 207–8
- F**
- Field data types, 149, 153–4, 167
 - Field Properties, 143, 153, 155, 157–61, 163–4, 234
 - Field Validation Rule property, 168
 - Field values, look-up, 161
 - File-based
 - approach, 13, 16–8, 29
 - systems, 16–8, 28–9
 - Filter Fields, 457, 461, 564
 - Font
 - property value, 352
 - tag, 491
 - For-Each-Next loop structure, 298
 - For-Next loop
 - nested, 309–10
 - structure, 297–8, 312, 318
 - Forecasting Methods, 657–8, 666–7
 - ForeColor properties, 369, 526
 - Foreign keys, 87–90, 94, 96, 100, 153–4, 162, 180, 215, 233, 235–6, 392, 440
 - Form, pop-up, 428–9, 444–5
 - Format fields, 462
 - Formatting Charts and Fields, 461
 - Function Name, 208, 242
 - Function procedure, 321, 324–5, 327–30, 332, 334–5, 344–8
 - Functional dependencies, 84, 109, 113–6, 118, 120, 122, 130–1
 - partial, 116–7, 121–3, 129
 - Functions
 - built-in, 159, 201, 206–8, 282
 - checking, 282, 284–5
 - substring, 303
 - Fundamentals of Database systems, 675
- G**
- Generalization and Specialization
 - process, 33, 60–1
 - GetChanges, 436
 - Getting Help on Compressing Database Size, 147
 - Good Database Design, 9, 675
 - GridView, 542, 547, 568–9, 583, 624–5
 - GridView Control, 535–7, 539–41
 - GridView control, data-bind, 535–6, 540, 542
 - GridView Picture field, 547
 - GroupBy, 203, 205, 236
 - GroupBy Operation, 189, 203–6
 - GUI, 4–7, 10–1, 25, 378–9, 666, 671
- H**
- Hardware, 24–5, 482
 - HeaderText property, 547–8, 556–7
 - Hiding Tables in Relationships
 - Window, 184
 - Hyperlinks, 154–5, 481, 493–4, 502–4
 - HyperText Markup Language, 481–5
- I**
- IDE, 10, 258–9, 261, 267–8, 270–1, 273, 279, 281, 457
 - windows, 261–2, 264, 271, 273, 511
 - Identifier, 37–8, 52–3, 55, 59, 86, 91
 - partial, 105–6
 - If-Then-Else, 276, 287
 - structure, 287–8, 290
 - Image
 - files, 495, 546
 - tag, 495–7
 - ImageField, 547–8, 553, 555–6, 560
 - ImageField ASP tag, 548, 557
 - ImageField entry, 547
 - ImageField Properties, 547
 - ImageField tag, 557
 - ImageField's properties pane, 556
 - Img, 495, 503–4
 - Import, 140, 165, 170, 594
 - Import Wizard, 165–6
 - Index
 - unique, 181, 183
 - value, 359
 - image list, 368
 - INDEX statement, 233, 235
 - Indexed property, 157, 160
 - IndexOf function, 303
 - InitForm subroutine, 646
 - Input mask, 156–8, 167–72
 - Input Mask Wizard, 157–8, 167, 170
 - Input TextBox, 273–4
 - InputBox, 278–81, 285, 305, 308, 310–1, 327
 - function, 278–81
 - Insert Table, 500, 511
 - Insertion anomalies, 111–3, 116, 120, 122
 - IntArray, 304
 - Integer, 282
 - number, 327, 506
 - random, 346
 - values, 280, 284, 334, 341, 359
 - user-specified non-zero, 325
 - Integrity constraints, 24, 28, 86, 122–4
 - IntelliSense, 271, 281
 - Interface, 4, 19, 21, 142, 144, 258, 350, 378, 506
 - Internet, 7, 11–2, 19, 21, 73, 481–3, 485, 503–4
 - database applications, 20
 - Internet Explorer, 354, 482–4
 - Internet Information Server, 483
 - Invalid length values, 345
 - IsNumeric function, 285
 - IsPostBack method, 515–6, 527–8
 - Items collection, 307–8, 359, 363
 - ItemTemplate
 - field, 589
 - tag, 559
- J**
- Join, 144–5, 198–9
 - condition, 199, 200, 240
 - inner, 199, 200, 239–40, 242
 - of Multiple tables, 189, 201, 411, 423, 425, 531, 542–3
 - operation, 189, 197–202
 - query, 239, 468
 - result, 198–200, 205, 242
 - types, 177, 200
 - Join Properties, 200

K

Key attribute, 37–9, 55, 69–71, 73, 85
 composite, 38
 foreign, 89, 97
 non-primary, 115, 117, 122
 partial, 55, 105
 primary, 115–6
 valid, 38

Key Name, 234–5

KeyPress event, 354, 356

Keys, composite primary, 93, 96, 100, 102, 105, 115

Knowledge of database design, 10, 258

L

Label control, 263, 269–70, 353, 474, 508, 518, 526
 properties, 264

Labels and LinkLabel Controls, 349, 353

LAN, 482

Language
 complete database, 232
 standard query, 136, 232

Layout of Relationships Window, 182

Line chart, 456, 467

Linking Access Tables, 176

LinkLabel Controls, 349–50, 353–4, 642

List of Access queries, 145

ListBox Control, 306–7, 499, 512, 528, 606
 multi-select, 350
 option, 528

ListBox Web Control, 512

ListItem Collection Editor, 512–3

Load event, 269, 459, 515
 handler, 515–6
 and IsPostBack Property, 505, 515

Logical
 database design, 19, 24, 27–8, 84, 91, 108–9
 errors, 312–3, 316, 338

Lookup
 fields, 162, 164
 tab of Field Properties, 164

Lookup Wizard, 161–3, 167–9, 171–3, 403
 page, 162–3

Loop structures, 286–7, 293, 314, 316

M

Main
 method, 370
 procedure, 370, 372, 641–2

Make-Table queries, 190–1, 220

Many-to-many relationship, 34, 42, 52, 96, 100–1, 106, 176, 183, 185–7

MapPoint, 640, 643
 control, 640–1, 644, 647–8, 650

MapPoint Reference, 639, 641, 643

MapPoint software, 640, 645, 652

Master page, 576–81, 598, 601–3, 605, 624, 636–7
 designed, 580
 file, 581
 option, 578, 580
 template, 578
 uses, 605

MasterPageFile attribute, 581

MAX, 242, 247–8

MaxDate and MinDate properties, 366

Menu
 and Database toolbar, 139
 user controls, 642–3, 646

Menu control, 600–3, 642

Menu Database, 227

MessageBox, 275, 278–81, 290, 293, 296, 305, 307, 309, 316–9, 327, 336, 367, 440, 442

MessageBoxIcon.Information, 280–1

MessageBox.Show, 278, 280, 287–8, 292, 318, 323

Metadata, 13–6, 18, 22, 28–9, 486, 503

Microsoft Access, 4, 7, 10, 136, 148, 150, 152, 675

Microsoft Access Databases, 675

Model
 entity-relationship, 26, 29, 33–4, 55, 70, 84
 relation-based, 34

Modules, 10, 322, 331–3, 343–4, 450
 design program, 322
 standard, 331–2, 344, 370

MS Access, 10, 19, 403, 607, 609, 656, 675

Multi-Dimensional Arrays, 275, 308–10

Multi-Select ListBox, 360

Multi-Select ListBox Control, 360

Multi-valued attribute, 37, 65, 92–3, 104, 110, 122–3, 125

Multiple tables, join of, 440, 468, 476, 532, 542

N

Name attribute, 59

NET
 architecture, 379, 412–3, 448

database applications, 379
 objects, 271, 273, 322, 379, 412, 435, 444, 448, 656, 661, 674

New Project, 259–60, 354, 381, 450

NF, 109, 116, 126–31
 relations, 126–8, 130–1

Normal form, 108–10, 116, 120, 122–4, 126, 128
 fifth, 109–10

Normalization, 93, 108–9, 116, 118

NULL, 88–90, 95, 112, 122, 180, 199, 234–5, 244

NumericalUpDown control, 667–72

O

Object Bar, 138–9, 141, 145, 150, 152–3

Object-based
 data models, 9, 26, 28–9, 34
 entity-relationships, 84
 model, 26, 28, 34

Object Browser, 257, 271–3

Object Browser Window, 272

OleDbCommand object, 566–7

OleDbDataReader object, 566–7

Operators, 200–1, 239, 270, 276, 292, 300
 comparison, 200
 logical, 200–1, 239, 300, 317

Optimization Page, 599, 609, 615, 617, 619

Optimization solution, 619, 672, 674

Optimize, 8, 600–1, 609, 615, 620

Options dialog box, 140–1

Order Confirmation, 577–8

Ordered lists, 492, 503
 of fields, 504

Outer join, 199, 223

Overview
 of Database development, 10
 of Principles of Good Database Design, 9

P

Page
 .aspx, 549, 552, 564
 background color, 528
 footer, 461, 529, 577–8, 598
 grouping, 454, 463–4, 469, 562
 header, 461, 523, 577–80, 598, 624
 load, 584, 626
 multiple GridView control, 540
 navigation menu, 578, 598
 new, 509, 511, 522, 529, 544, 560, 580, 598, 637

- Page (*cont.*)
 - pop-up, 637
 - property, 643
 - redirected, 523
 - start-up, 509–10
 - stored procedures, 543, 546
 - tag, 517, 527
 - template, 486
 - wizard, 452, 537–9, 544, 561
 - Page Backgrounds, 481, 494
 - Pane, 400, 454, 464, 469, 562
 - Parameter SQL query, 590
 - Parameter value source, 551
 - Parameterized queries, 398–400, 418, 420–1, 472–3, 476–7, 548, 552, 568–9
 - Parent-child relationship, 393, 395
 - Participation
 - partial, 63–5, 67
 - rule, total, 63, 70
 - total, 63–5
 - Participation Constraints, 63
 - Pass-By-Reference, 322, 330, 344
 - Pass-by-Value, 322
 - option, 330
 - Physical database design and Creation, 24
 - PictureBox control, 265–6, 269–70, 274, 371, 391–2, 407
 - Pie chart, 15, 456, 464
 - Portal Page, 599, 601, 609
 - Portfolio Management and
 - Optimization, 8, 11, 573, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620
 - Power, 300–1, 506, 527, 560, 676
 - Preview Data, 401
 - Preview query results, 401, 403
 - Primary key, 87–90, 113–4, 152, 164, 180, 199, 233–4
 - and Functional dependencies, 114
 - values, 89, 90, 122, 180, 215–6, 218
 - Principles of Good Database Design, 9, 675
 - Procedure call, 315, 323, 330, 343
 - Procedures
 - callee, 330
 - caller, 330, 333, 343–4
 - Process
 - of logical database design, 27, 91, 108
 - top-level, 379–80, 384, 407
 - Processing, approximate query, 677
 - Products, quantity of, 74
 - Programming, object-oriented, 4, 322, 331
 - Projection, 191–3, 196, 198–9, 201–2, 206, 220, 236
 - operation, 191, 193–5, 198
 - Properties
 - design-time, 273
 - dock, 466, 471, 473
 - image, 371, 391–2
 - run-time, 273
 - values, 508–9
 - Properties Design Grid, 197
 - Properties Window, 263–4, 307, 369–70
 - Property procedures, 322, 324, 337, 344, 346
 - Provider attribute, 416
- Q**
- Query
 - cross-tab, 451
 - in Datasheet View, 145
 - in Design View, 146
 - execution, 145, 208, 401, 607
 - language, 232
 - multi-table, 423, 542
 - nested, 241
 - outer, 241
 - parameters, 220, 399, 401–2, 424
 - performance, 157
 - string, 522–3, 529
 - type, 197, 213–4, 217, 219, 420
 - Query Builder, 400–1, 403, 407, 419–20, 424–5, 430, 543–5
 - option, 473
 - Query-by-Example, 144, 190, 220
 - Query Design Grid, 206
 - Query Properties View, 197
 - Query Type Name, 197
 - Query Type Table Pane, 197
 - Query Wizard, 224
- R**
- RadioButton, 350, 499, 503
 - controls, 288–90, 357, 359
 - RadioButtonList, 624
 - control, 624–5
 - Random number generation, 320, 346
 - RandomNumber, 346
 - Reconfiguring SQL Query, 531, 536–7, 539
 - Record Selection page, 457, 463, 564
 - Recordset, 191, 206, 212, 220
 - Redirect, 493, 522, 578, 588, 592, 598, 610, 641
 - Redirect Display, 522
 - Referential integrity, 177, 180–1, 183, 185–7, 215, 221
 - arrows, 104, 106, 179
 - constraints, 89, 90
 - Regular entity, 91–7, 100–1, 103, 106
 - relations, 96, 100–1
 - Regular Expression Editor, 520
 - RegularExpressionValidator controls, 518, 520, 527
 - Relation, 27, 29, 84
 - decomposition, 93, 197
 - normalize database, 197
 - subclass entity, 104
 - weak entity, 105
 - Relational
 - databases, 10, 18, 86, 141, 232, 432
 - keys, 83–4, 86–7, 114, 392
 - schema, 24, 84–5, 141, 179, 190
 - Relational Data Integrity, 84, 122
 - Relational Data Integrity Constraints, 83–4, 86, 89
 - Relational Data Modeling, 24, 27–8, 34, 83–90, 116, 122–3, 150, 183
 - Relational Data Structure, 84, 122
 - Relationship
 - cardinalities, 34, 43, 73
 - instance, 39, 44–5, 47, 49
 - matching, 39
 - lines, 179–80, 182, 184–5, 200, 202, 234
 - set, 39, 40
 - types, 39, 93, 177, 181, 183, 185
 - Relationship Window, 144, 181
 - Relationships, 39, 177, 179, 199, 218, 392, 478
 - defined, 176
 - attribute, 113
 - button, 177
 - indeterminate, 183
 - layout, 184
 - one-to-many, 34, 41, 45, 52, 54, 177, 182–3
 - one-to-one, 34, 41, 47, 59, 183, 187
 - one-to-one, 103
 - optional, 43
 - primary key-foreign key, 89, 180, 215
 - selected, 179
 - super-type, 71
 - toolbar, 177–9, 185
 - Relationships Window, 175–86, 199, 576, 600, 622
 - and Enforce Referential Integrity, 186

- Removing Fields and Tables in Design View, 196
 - Rename Column option, 152
 - Renaming Query Tables and Fields Using, 238
 - Repair Database, 147
 - Repeater control, 557–60, 569, 571
 - Repeater Control, 531, 557, 559
 - Report
 - blank, 451
 - data source, 476
 - design, 450, 472, 476, 627, 629
 - existing, 451, 472
 - fields, 457, 461, 476, 564
 - file, 459–61, 609, 627, 629, 631–2
 - footer sections, 461
 - header, 457, 461–2, 465, 470
 - section, 461, 463, 476
 - new, 451
 - object, 460, 474–5, 608, 629, 632
 - query, 472
 - sections, crystal, 447, 460
 - source, 460, 565, 629, 632
 - Report Expert, 476, 561
 - Report Style, 457, 465, 470, 476, 564
 - Report title, 461
 - Report's Data Source, 629
 - Reports display charts, 477
 - Required property, 157, 159
 - RequiredField-Validator control, 518–20, 527
 - RequiredFieldValidator, 519, 596
 - and RegularExpressionValidator controls, 518
 - Row Source, 163–4
 - Rows
 - alternating, 394–5
 - collection, 310, 433, 436
 - new, 167, 233, 433, 439, 631
 - selected, 586, 614, 625, 631
 - sort, 196, 203
 - Rows Student Array, 309
 - Rules, disjoint, 64–5, 70–1
 - Run-time, 270, 316–7, 473, 476, 566, 609
 - Runners, 69, 172–3
 - Runtime errors, 338, 344
- S**
- Schemas, 24–6, 28, 91, 627, 631
 - conceptual, 24–5, 28
 - internal, 24–5, 28
 - Search Criteria Builder, 400, 421–2
 - Search Form, 377, 398–9, 401, 645
 - Second normal form, 109–10, 116–8, 121–2, 128
 - Select-Case
 - statement, 319, 627, 629
 - structure, 290–3, 299, 318, 347, 582
 - Select Queries, 189, 191, 193, 195, 201
 - Select SQL query, 386–7
 - Selected
 - field data, 210–1, 220
 - items, 306, 359–61, 363–5, 374, 514
 - value, 406, 671–2
 - SelectedIndex, 306–7, 359, 361
 - property, 306, 359, 361, 541
 - SelectedIndexChanged event, 362–3, 528, 582, 591, 626
 - SelectedItems, 306–7, 359–61
 - properties, 306
 - and SelectedIndex methods, 363
 - SelectedValue, 403, 406, 625–6
 - property, 405–6, 568
 - SelectIndexChanged event, 317, 607
 - Selection
 - multiple-field, 164
 - operation, 192–3, 195–6, 204, 208, 541
 - Server Explorer, 261, 267, 379, 414, 534, 569
 - Server Explorer Window, 267, 273, 413–6, 444, 531–5, 542
 - Servers, 226–7, 253, 267, 273, 483–4, 569
 - Services, database-related, 267
 - Session variables, 522, 576–7, 588
 - and Master page, 576, 598
 - Set Action Query Types, 213
 - Simple Query Wizard option, 192
 - Single Exponential Smoothing, 657–8, 661, 664
 - Solution Explorer Window, 261–2
 - Sorted property, 360, 363
 - Sorting operations, 191–3, 196, 198–9, 396, 540
 - Specialization, 56, 60–3, 69, 76–7, 79
 - process, 33–4, 56, 60–1
 - Specialized entities, 60–1
 - SQL, 86, 136, 232, 403
 - field constraints, 235
 - query
 - parameterized, 417
 - single, 387
 - in TableAdapter Query Configuration Wizard, 421
 - SQL Statement, 231–2, 234–45
 - Standard tab, 508–9, 512–3
 - Start page, 258–9, 510, 514, 525, 559, 565, 568
 - Start-up form, 285, 372
 - Statements
 - declaration, 277–9, 331, 344
 - executable, 278
 - exit, 299
 - Static Pages, 502
 - String, 301
 - operations, 207, 302
 - operators, 275, 300–4
 - Structured Query Language, 86, 136, 232
 - Structured Relations, 110
 - Styles and Items properties, 585
 - Subclass
 - hierarchy, 33, 66–7, 70
 - relationships, 56–61, 63–5, 103–5
 - Subclass Discriminators, 65, 70, 104
 - Subclasses, 33, 56–61, 63–7, 69, 70
 - Subroutine, 270, 276–7
 - procedure, 324–5, 327–30, 332–3, 335, 343–7, 370
 - Substring, 302–3
 - Summarized Fields, 454, 464, 469, 562
 - Super key, 86–8, 114, 122
 - minimal, 87–8, 114
 - Superclass, 33, 56–61, 63–7, 69, 70, 103–4
 - entity, 104
 - type, 57, 61, 64, 104
 - instance, 63–5, 70
 - relation, 104
 - Syntax errors, 312, 316, 338
 - System
 - developers, 18–21
 - object-oriented, 22
 - relational, 21–2
 - stores, database management, 233
- T**
- Table
 - adapter, 413, 460, 466–7, 473, 656
 - attribute, 233
 - constraints, 234–5
 - fields, 157, 160–1, 166, 193–4
 - index, 157, 160, 233
 - Table Design View, 153, 184
 - Table Pane, 146, 193–4, 199, 403, 424
 - Table properties, 149, 166, 511
 - TABLE SQL statement, 234
 - TABLE statements, 232–4
 - Table Validation Rule and Table Validation Text, 167

- TableAdapter, 385, 387, 397, 399, 413, 417
 - and BindingSource objects, 413
 - and DataTable objects, 468
 - new, 389, 423–4, 430, 468
 - TableAdapter Configuration Wizard, 380, 417, 419, 423, 430, 468, 628
 - TableAdapter Object, 379–80, 387, 407, 413, 417, 444, 468, 473
 - TableAdapter Query Configuration Wizard, 380, 420, 473
 - Tables in Design View, 142
 - Task Pane, 137–8, 148, 152
 - Template ImageField, 556
 - Text
 - data, 234, 292, 487–8, 496–8, 503, 546
 - format, 15, 588, 640, 647–8
 - italic, 484
 - property, 269–70, 279, 283–4, 305, 307, 310, 346, 390, 474, 512–3, 522, 550
 - selected, 306, 359, 361
 - and Value property, 512
 - Text Align, 264
 - TextAlign, 355–6
 - TextBox
 - control
 - input validation, 355–6
 - value, 375
 - controls, 292, 298, 354–5
 - and ListBox control, 361
 - Third normal form, 109–10, 118–22, 124, 128
 - Time attributes, 102
 - ToolBox, 261–3, 273, 466, 643–5
 - ToolStrip control, 384, 386–7
 - ToString method, 359, 361, 365
 - Total
 - query, 204, 207, 210
 - row, 197, 203–5, 207, 211
 - Transformation
 - of binary many-to-many relationship, 100
 - of multi-valued attribute, 93
 - Transformed
 - binary many-to-many relationship, 101
 - ternary relationship, 103
 - Transforming Binary Many-to-Many Relationships, 100
 - Transforming Binary One-to-Many Relationships Figure, 99
 - Transforming Binary One-to-One Relationships, 97
 - Transforming Binary Relationships, 97
 - Transforming Composite Attributes, 91
 - Transforming Multi-Valued Attributes, 92
 - Transforming Regular Entities, 91
 - Transforming Ternary Relationships, 101
 - Transforming Unary Many-to-Many Relationship Figure, 95
 - Transforming Unary One-to-Many Relationships Consider, 94
 - Transforming Unary Relationships, 94
 - Transforming Weak Entities, 105
 - Transitive dependencies, 110, 115–6, 118–23, 126–7, 129–31
 - TreeView control, 350–1, 368–9, 372
 - Try-Catch structure, 339
 - Tuple, 84, 122, 141, 148, 150, 233
 - Two-Stage database update
 - propagation process, 435, 444
- U**
- Unary
 - many-to-many relationship, 46, 95–6
 - one-to-many relationship, 45, 94–5
 - one-to-one relationship, 44
 - relationship, 33, 40, 44–6, 69, 94, 96
 - Unordered
 - bulleted list, 492
 - lists, 492, 503
 - Update
 - anomalies, 111, 113, 120, 122, 129–31
 - cascaded, 222–3, 225, 228
 - criteria, 213, 245, 247
 - and Delete Queries, 221
 - methods, 437, 440
 - UPDATE query, 420
 - Update SQL
 - command, 437
 - statements, 231, 236, 245, 443
 - URL, 155
 - parameter, 610–1
 - query string, 529
 - Use RequiredFieldValidator controls, 527
 - User-defined Web controls, 505, 523–7, 529
 - User controls, 506, 525, 639–44
 - User-friendliness, 5, 187
 - User interface, 6, 11–2, 350, 371–2
 - clear, 5
 - friendly graphical, 4
 - graphical, 4, 6, 7, 369, 379, 498
 - well-designed, 350
 - User Interface Design, 676
 - Using Total Row, 189, 203, 205
 - Using Validation Rule and Validation Text Properties, 158–9
- V**
- Validate Button, 518–9, 521
 - Validation
 - controls, 518–9, 521, 527–8, 577, 596, 598
 - rule, 157, 159–60, 167–8, 170, 235
 - and Validation Text Properties, 159, 166
 - Validation Text, 157, 159, 166–7
 - Value
 - column, 314
 - field, 164, 210–1, 549
 - option, 156, 211
 - property, 366–7, 512
 - source, 551, 553–4
 - Value Member Set, 406
 - ValueChanged event, 669, 671
 - ValueMember property, 404–5
 - Values
 - concatenate, 305
 - constraint, 668
 - domain, 491
 - double, 284, 301
 - foreign key, 89, 90, 161, 180, 215, 239
 - item, 307
 - key, 181
 - attribute, 37
 - logical, 300
 - numeric, 88, 244, 283
 - passing, 522, 527
 - property, 264, 337, 352, 474, 501
 - random, 346
 - valid, 56, 336
 - VARCHAR, 234, 244
 - View Detail, 578, 583, 585–6
 - Visual Basic, 4, 20, 232, 255
 - Visual Basic Classes, 321, 334–5
 - Visual Basic Data Types, 275–6, 282–3

- Visual Basic Modules, 321, 331–3
 - Visual Basic Statements, 275–7, 322–4, 343
 - Visual Programming, 262, 273
 - Visual Studio, 10, 258
- W**
- Watch Windows, 314–6
 - Weak entities, 105
 - Web, 11–2, 154, 258, 481–3, 485, 503
 - application, 11–2, 506, 514
 - browser, 8, 482–5, 515–6, 577, 598
 - controls, 514–5, 518, 523, 532, 602–3
 - on Web form, 11
 - user-defined, 523, 527
 - Web-based
 - crystal report, 531, 560–1, 563, 565, 569–71
 - database
 - application development, 258
 - applications, 14, 258
 - Web-enabled
 - database applications, 378
 - decision support system, 5, 7, 11
 - Web form, 506, 509, 525, 528–9
 - Web Page, 487, 495, 549, 551
 - Web server, 483, 485, 506, 532
 - Windows
 - application, 10–1, 258–9
 - development, 9–11, 255, 260, 675
 - control, 262, 269, 271, 378
 - and BindingSource, 391
 - form, 10, 259, 262
 - and Web-based database applications, 258
 - Wizard, 414, 430, 455, 457, 463
 - World Wide Web, 7, 10, 482, 503
 - WWW, 7, 10–1, 482