# Index

## Symbols and Numerics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&amp; (ampersand)</td>
<td>parameter queries, 408</td>
</tr>
<tr>
<td>! (exclamation point)</td>
<td>parameter queries, 408</td>
</tr>
<tr>
<td>. (period)</td>
<td>parameter queries, 408</td>
</tr>
<tr>
<td>[ ] (square brackets)</td>
<td>parameter queries, 406, 408, wildcard, 430</td>
</tr>
<tr>
<td>&lt; &gt; (not equal)</td>
<td>comparison operator, 273, 451–452</td>
</tr>
<tr>
<td>= (equal)</td>
<td>comparison operator, 273, 451–452</td>
</tr>
<tr>
<td>&gt; (greater than)</td>
<td>comparison operator, 274, 451–452</td>
</tr>
<tr>
<td>&gt;= (greater than or equal to)</td>
<td>comparison operator, 274, 451–452</td>
</tr>
<tr>
<td>&lt; (less than)</td>
<td>comparison operator, 273–274, 451–452</td>
</tr>
<tr>
<td>&lt;= (less than or equal to)</td>
<td>comparison operator, 274, 451–452</td>
</tr>
<tr>
<td>+ (addition)</td>
<td>mathematical operator, 270, 271</td>
</tr>
<tr>
<td>/ (division)</td>
<td>mathematical operator, 270, 271</td>
</tr>
<tr>
<td>^ (exponentiation)</td>
<td>mathematical operator, 270, 272</td>
</tr>
<tr>
<td>\ (integer division)</td>
<td>mathematical operator, 270, 271–272</td>
</tr>
<tr>
<td>* (multiplication)</td>
<td>mathematical operator, 270, 271</td>
</tr>
<tr>
<td>- (subtraction)</td>
<td>mathematical operator, 270, 271</td>
</tr>
<tr>
<td>&amp; (concatenation)</td>
<td>string operator, 275–276</td>
</tr>
<tr>
<td>[! ] (wildcard)</td>
<td>406, 408, 430</td>
</tr>
<tr>
<td>* (asterisk)</td>
<td>wildcard, 430</td>
</tr>
<tr>
<td># (pound sign)</td>
<td>wildcard, 430</td>
</tr>
<tr>
<td>? (question mark)</td>
<td>wildcard, 430</td>
</tr>
<tr>
<td>1NF (first normal form)</td>
<td>90–93</td>
</tr>
<tr>
<td>2NF (second normal form)</td>
<td>94, decomposition, 97–98, entities, 96–98, identifying, 94–96, exceptions, 98–99, update anomalies, 95</td>
</tr>
<tr>
<td>3NF (third normal form)</td>
<td>99–100</td>
</tr>
</tbody>
</table>

## A

<table>
<thead>
<tr>
<th>Description</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access, as landing pad for data</td>
<td>173</td>
</tr>
<tr>
<td>ACE (Access Connectivity Engine)</td>
<td>20, 901–902</td>
</tr>
<tr>
<td>query optimization</td>
<td>348–349</td>
</tr>
<tr>
<td>Action Catalog</td>
<td>747</td>
</tr>
<tr>
<td>data actions</td>
<td>749–751</td>
</tr>
<tr>
<td>data blocks</td>
<td>748–749</td>
</tr>
<tr>
<td>macro groups</td>
<td>748</td>
</tr>
<tr>
<td>program flow</td>
<td>748</td>
</tr>
<tr>
<td>action queries</td>
<td>320</td>
</tr>
<tr>
<td>append queries</td>
<td>327–332</td>
</tr>
<tr>
<td>SQL statements</td>
<td>437</td>
</tr>
<tr>
<td>subqueries</td>
<td>456</td>
</tr>
<tr>
<td>delete queries</td>
<td>323–326</td>
</tr>
<tr>
<td>SQL statements</td>
<td>437</td>
</tr>
<tr>
<td>subqueries</td>
<td>456</td>
</tr>
<tr>
<td>make-table queries</td>
<td>321–323</td>
</tr>
<tr>
<td>SQL statements</td>
<td>436</td>
</tr>
<tr>
<td>subqueries</td>
<td>456</td>
</tr>
<tr>
<td>update queries</td>
<td>332–336</td>
</tr>
<tr>
<td>SQL statements</td>
<td>437</td>
</tr>
<tr>
<td>subqueries</td>
<td>456</td>
</tr>
<tr>
<td>Activate event</td>
<td>849, 853</td>
</tr>
<tr>
<td>ActiveX controls</td>
<td>504</td>
</tr>
<tr>
<td>ad hoc joins</td>
<td>265–266</td>
</tr>
<tr>
<td>ADO (ActiveX Data Objects)</td>
<td>763</td>
</tr>
<tr>
<td>Command object</td>
<td>920–922</td>
</tr>
<tr>
<td>Connection object</td>
<td>918–920</td>
</tr>
<tr>
<td>library</td>
<td>917–918</td>
</tr>
<tr>
<td>Recordset object</td>
<td>922–923</td>
</tr>
<tr>
<td>AfterDelConfirm event</td>
<td>850</td>
</tr>
<tr>
<td>AfterDelete event</td>
<td>744–745</td>
</tr>
<tr>
<td>AfterInsert event</td>
<td>744–745, 850</td>
</tr>
<tr>
<td>AfterUpdate event</td>
<td>744–745, 850, 852</td>
</tr>
<tr>
<td>aggregate functions</td>
<td></td>
</tr>
<tr>
<td>Avg, 316</td>
<td></td>
</tr>
<tr>
<td>Count, 317</td>
<td></td>
</tr>
<tr>
<td>domain aggregate functions, 445</td>
<td></td>
</tr>
<tr>
<td>Expression, 318–320</td>
<td></td>
</tr>
<tr>
<td>First, 317</td>
<td></td>
</tr>
<tr>
<td>Group By, 315–316</td>
<td></td>
</tr>
<tr>
<td>Last, 317</td>
<td></td>
</tr>
<tr>
<td>Max, 317</td>
<td></td>
</tr>
<tr>
<td>Min, 317</td>
<td></td>
</tr>
<tr>
<td>StDev, 317</td>
<td></td>
</tr>
<tr>
<td>Sum, 316</td>
<td></td>
</tr>
<tr>
<td>Var, 317</td>
<td></td>
</tr>
<tr>
<td>Where, 318–320</td>
<td></td>
</tr>
</tbody>
</table>
aggregate information in subforms, 572–573
aggregate queries, 311
descriptive statistics and, 470–471
versus domain aggregate function, 459
results to hard tables, 322
aggregation, 165–166
results, in calculations, 381–382
aggregation functions, Group By, 315–316
aliases
AS clause (SQL), 433
column names, 314–315
correlated subqueries and, 454–455
alignment
controls, 517–518
report controls, 687
Allow Additions property, 555
Allow Datasheet View property, 550
Allow Deletions property, 554
Allow Edits property, 554
Allow Filters property, 554
Allow Form View property, 550
Allow Layout View property, 550
Allow Zero Length property, 54
AllowZeroLength property, 65–66
alphanumeric data, 42
ALTER TABLE statement (SQL), 440–442
ADD clause, 441
ADD CONSTRAINT clause, 442
ALTER COLUMN clause, 441
DROP COLUMN, 441–442
Alternate Row Color drop-down list, 156
ampersand (&), parameter queries, 408
analyses
calculations, 379–380
aggregation results in, 381–382
as argument in function, 382–384
constants in, 380
dates, 392–399
errors, 388–391
Expression Builder and, 384–388
fields, 42
fields in, 381
null values and, 389–391
operator precedence and, 388–389
syntax in expressions, 391
conditional, 405
parameter queries, 405–407
And operator, 278–279, 300–302
select criteria, 286–288
append queries, 327
conversion failure, 327
key violations, 327
lock violations, 327
subqueries, 456
validation rule violation, 327
application testing, debugging and, 867–873
applications
development
building to specification, 1003–1005
documentation, 1005–1007
testing, 1007–1008
distribution
Application Options, 994–999
bulletproofing, 1022–1034
consistent style, 1009–1022
development, 1003–1008
Name AutoCorrect options, 1002
Navigation options, 999–1001
Ribbon and Toolbar Options, 1001–1002
security, 1034–1038
ApplyFilter event, 850
arguments
macros, 706
macros, 706
Beep, 707
Message, 707
Title, 707
Type, 707
named arguments, 840–842
parameters as, 411–414
procedures, named arguments, 840–842
Array function, 826–827
arrays
dynamic, 825–826
fixed, 822–824
functions
Array, 826–827
boundaries, 826
Join, 828–829
Split, 827–828
AS clause (SQL), 433
Attachment data type, 42, 48
attachment fields, 84–85
Auto Center property, 550
Auto Resize property, 550
AutoCorrect, 35
AutoNumber data type, 42, 47, 50
primary keys, 114
AutoSum button, 165–166
Avg aggregate function, 316

B
Back Color property, 557
Background Color drop-down list, 156
background pictures, 580–582
BeforeChange event, 743
BeforeDelConfirm event, 850
BeforeDelete event, 744
BeforeInsert event, 850
BeforeScreenTip event, 849
BeforeUpdate event, 743, 850, 852
Between...And operator, 281, 302, 408–409
binding reports to tables, 629–631
Blank Database option, 18–20
Blank Form command, 491, 492
BMP images, 578, 581
Boolean data type (VBA), 809
Boolean (logical) operators, 270, 278–280
   And, 278–279
   Not, 280
   Or, 279–280
   precedence, 283
   select criteria, 286
Border Style property, 551
bound controls, 506
   user names, 688
bound forms, 547–548
brackets, [ ] (square brackets), 406
breakpoints, debugging and, 881–887
bulleted lists, 674–676
Button Ribbon control, 958–959, 982–983
Byte data type (VBA), 809

C
calculated controls, 506
   unbound, 571
Calculated data type, 42, 48
calculations, 379–380
   aggregation results in, 381–382
   as argument in function, 382–384
   constants in, 380
dates, 392
   age in years, 394–396
   Date function, 393–396
   DateAdd function, 399–400
   DateSerial function, 401–403
   Day function, 397–399
days past, 393
Month function, 397–399
Weekday function, 397–399
workdays, 398–399
Year function, 397–399
errors, 388–391
Expression Builder and, 384–388
fields, 42
fields in, 381
null values and, 389–391
operator precedence and, 388–389
syntax in expressions, 391
Call Stack window, debugging and, 892–893
Can Grow property, 644–645
Can Shrink property, 644–645
CancelRecordChange action, 749
Caption, 550
Caption property, 54, 63, 546–547
Cascade Delete Related Records, 124
Cascade Related Fields check box, 124
case, changing, 367–368
categories, controls, 504–506
cells, gridlines, 156–158
Change event, 852
canon markers, string parsing and, 374–377
Check Box control, 570
check boxes, tallying, 573
CheckBox Ribbon control, 960, 983–984
child table, foreign key, 116
Choose Builder dialog box, 735
ClearMacroError action, 751
Click event, 844, 847, 849, 852
Clipboard, copy and paste in Datasheet window, 148–149
Clipboard group
   Copy option, 535
   Cut option, 535
   Datasheet Ribbon, 134
   Format Painter option, 535
   Paste command
      Paste Append option, 534
      Paste option, 534
      Paste Special option, 534
Close Button property, 551
Close event, 849, 853
Collectible Mini Cars Customers, 38
collections, 903
   Properties collection, 903
color, alternating rows, 156–158
Index

color schemes, reports, 614–616
Column Width dialog box, 153–154
columnar layout, 495
columnar reports, 600, 601–602
columns, 5–6
  adding, 441
  aliases, AS clause, 433
  alignment, 158
ALTER TABLE statement (SQL), 440–442
  ADD clause, 441
  ALTER COLUMN clause, 441
  DROP COLUMN, 441–442
altering, 441
deleting, 441–442
freezing, 159–160
hiding/unhiding, 158–159
names, aliases, 314–315
ranking columns, 672
resizing, 153–154
selecting
  all, 427
  specific, 427
snaking, 692–696
vertical lines, 680–682
width, 153–154
Combo Box control, 568
  Bound Column property, 569
  Column Count property, 569
  Column Heads property, 569
  Column Widths property, 569
  Limit To List property, 569
  List Rows property, 569
  List Width property, 569
  Multi Select property, 570
  Row Source property, 569
  Row Source Type property, 569
  Validation Rule property, 569
  Validation Text property, 569
combo boxes, 542–543
  Organization, 575
  source, 574
unbound, 937–939
    bookmarks, 941–944
    FindRecord method, 939–941
ComboBox Ribbon control, 960
comma-delimited text files, importing, 185–188
Command Button control
  Hover Color property, 568
  Hover Fore Color property, 568
  Picture property, 568
  Picture Type property, 568
  Pressed Color property, 568
  Pressed Fore Color property, 568
  Yes/No property, 568
command buttons, query dialog, 587–588
Command object (ADO), 920–922
commands
  Blank Form, 491, 492
  Form, 493–492
  Form Design, 491, 492
  Quick Access toolbar, 26
  Snap to Grid, 518
comma-separated-values text files
importing, 185–188
  linking to, 223
compacting database, query optimization and, 351
comparison operators, 270, 273
  = (equal), 273, 451–452
  > (greater than), 274, 451–452
  >= (greater than or equal to), 274, 451–452
  < (less than), 273–274, 451–452
  <= (less than or equal to), 274, 451–452
  <> (not equal), 273, 451–452
preference, 283
queries, select queries, 284–285
subqueries, 451–462
compiling code, application testing and and, 871–873
complex criteria, 285–288
  on different lines, 308–309
composite indexes, 76–78
composite primary keys, 72–73, 117–118
concatenation, fields, 364–367
conditional analysis, 405
  functions
    IIf, 414–423
    Switch, 420–423
  parameter queries, 405–407
conditional functions
  IIf
    arguments, 414
    compared to Switch, 421–423
crosstab analysis, 419–420
mathematical errors avoidance, 415–416
nesting, multiple conditions and, 418
saving steps, 416–418
Switch
  compared to IIf, 421–423
expressions, 420
values, 420
conditions, macros, 720–723
Connection object (ADO), 918–920
constants
in calculations, 380
declaring, 820
hard-code values, 821–822
naming conventions, 821
Control Box property, 551
control events, 851
AfterUpdate, 852
BeforeUpdate, 852
Change, 852
Click, 852
Db1Click, 852
Dirty, 852
Enter, 852
Exit, 852
GotFocus, 852
KeyDown, 852
KeyPress, 852
KeyUp, 852
LostFocus, 852
MouseDown, 852
MouseMove, 852
MouseUp, 852
NotInList, 852
Undo, 852
Updated, 852
writing, 858–864
Control Source, combo boxes and, 574
controls, 503–504
ActiveX, 504
alignment, 517–518, 687
appearance, 519
calculated, unbound, 571
categories, 504–506
Check Box, 570
Combo Box, 568
   Bound Column property, 569
   Column Count property, 569
   Column Heads property, 569
   Column Widths property, 569
   Limit To List property, 569
   List Rows property, 569
   List Width property, 569
   Multi Select property, 570
   Row Source property, 569
   Row Source Type property, 569
   Validation Rule property, 569
   Validation Text property, 569
Command Button
   Hover Color property, 568
   Hover Fore Color property, 568
   Picture property, 568
   Picture Type property, 568
   Pressed Color property, 568
   Pressed Fore Color property, 568
   Yes/No property, 568
copying, 522
Date Picker, 541
deleting, 522
deselecting, 511–513
events, 851–852
writing, 858–864
Format Painter and, 579
forms, 16
   adding, 506–511
   attachment, 505
   bound controls, 506
   bound object frame, 505
   button, 505
calculated controls, 506
   chart, 505
   check box, 505
   combo box, 505
   field list, 508–511
   image, 505
   insert page break, 505
   label, 504
   line, 505
   link, 505
   list box, 505
   navigation control, 505
   option button, 505
   option group, 505
   rectangle, 505
   subform/subreport, 505
tab control, 505
text box, 504
toggle button, 505
unbound controls, 506
unbound object frame, 505
web browser control, 505
groups, 519–520
handles, 511–512
hiding/showing, 677–680
controls (continued)
Image, 577–578
Label
  cutting, 638–639
deleting, 638–639
moving, 640–642
naming, 527–529
pasting to section, 640
properties, 643–644
reattaching, 522–523
sizing, 637–638
List Box, 568
micro-adjustments, 687
morphing, 578–579
moving, 515–516
naming, 701
Option Group
  Control Source property, 570
  Default Value property, 570
  Frame Control property, 570
  Option Value property, 570
placing, 589–590
properties, 524, 563–564
  appearance, 566–567
  customizing, 565–566
  Design view, 564
  Property Sheet, 565, 566
  settings, 526–527
Property Sheet, 524–525, 643–644
  Data tab, 525
  Event tab, 525
  Format tab, 525
reports, placing, 633–634
resizing, 513–515
Ribbon, 956
  Button, 958–959, 982–983
  CheckBox, 960, 983–984
  ComboBox, 960
  DropDownList, 985–987
  Gallery, 958
  imageMso attribute, 979–980
  Label, 980–982
  Menu, 957–958
  separators, 983
  SplitButton, 957, 987–988
  ToggleButton, 959
selecting, 511–513
sizing, automatically, 515
Tab, 583–584
Caption property, 585
Multi Row property, 585
Picture property, 586
Style property, 585
Tab Fixed Height property, 585
Tab Fixed Width property, 586
Text Box
  Back Color property, 566–567
  Back Style property, 566–567
  Border Style property, 566–567
  Border Width property, 566–567
  Can Grow property, 644–645
  Can Shrink property, 644–645
  cutting labels, 638–639
  Default Value property, 567
deleting labels, 638–639
  Font Italic property, 567
  Font Name property, 567
  Font Size property, 567
  Font Underline property, 567
  Font Weight property, 567
  Fore Color property, 567
  Format property, 566
  functions, 637
  Input Mask property, 567
  moving, 640–642
  pasting labels, 640
  properties, 643–644
  sizing, 637–638, 644–645
  Special Effect property, 566–567
  Text Align property, 567
  Text Format property, 567
  Validation Rule property, 567
  Validation Text property, 567
ToggleButton, 570
type, changing, 520–522
Web Browser, Control Source property, 570
Controls group, 504–508
ControlTip Text property, 580
copying
tables, 82–83
to another database, 82–83
values, datasheets, 148–149
correlated subqueries, 453–454
as expressions, 455
Count aggregate function, 317
Create New Theme Colors dialog box, 614–615
Create New Theme Fonts dialog box, 616
Create tab (Ribbon), 24, 35
Forms group, 490–491
Table Design button, 37
Tables group, 36
CREATE TABLE statement (SQL), 438–440
crosstab queries
creating manual, 342–345
Crosstab Query Wizard, 336–342
customizing
column heading sort order, 346–348
defining criteria, 346
TRANSFORM statement (SQL), 437
Currency data type, 42, 47, 809
Currency format, 55–56
Current event, 850
Cycle property, 555

D
DAO (Data Access Objects), 763, 901–902, 904–905
Database object, 907–908
DBEngine, 905
Field objects, 916–917
QueryDef object, 909–911
Recordset object, 911
counting records, 915–916
Dynamic type, 911
Dynaset type, 911
dynamic (end/beginning detection), 914–915
Forward Only type, 911
navigating recordsets, 912–914
Snapshot type, 911
specifying type, 912
Table type, 911
TableDef object, 908–909
Workspace object, 905–906
data, 169–170
aggregating, 165–166
alignment, 158
definition, 5
events, 850–851
exporting, 171, 173
external, 169–170

External Data tab, 174–175
linking to, 170, 171–172
working with, 170
groups, sorting, 647–650
importing, 170
from Access databases, 175–178
Access objects, 198–200
from Excel spreadsheets, 178–184
HTML documents, 197–198
Outlook folders, 200–202
SharePoint lists, 185
from text files, 185–192
when to use, 172
XML documents, 192–197
landing pad, Access as, 173
linked, limitations, 213–214
linking to, 170
when to use, 171–172
reports
adding, 688
assembling, 604–605
sources, 604–605
unsupported programs, 173
working with, 170
data design, 11–13
data entry
Date/Time data type, 540–541
Long Text field, 540
properties and
Date/Time, 140–141
Long Text, 141–142
Number/Currency, 141
OLE Object, 141
text, 140
value lookup, 594–595
Data Entry property, 555
data macros, 742
collapsing items, 755
creating, 751–755
expanding items, 755
limitations, 757–758
Macro Builder, 745–747
moving items, 756
saving, as XML, 756–757
table events, 742–743
AfterDelete, 744–745
AfterInsert, 744–745
AfterUpdate, 744–745
BeforeChange, 743
BeforeDelete, 744
BeforeUpdate, 743
data properties
Allow Additions, 555
Allow Deletions, 554
Allow Edits, 554
data properties (continued)
  Allow Filters, 554
  Data Entry, 555
  Fetch Defaults, 555
  Filter, 554
  Filter On Load, 554
  Order By, 554
  Order By On Load, 554
  Record Locks, 555
  Record Source, 554
  Recordset Type, 555

data sets
  median, descriptive statistics and, 475–477
  merging, UNION operator, 438–440
  mode, descriptive statistics and, 472–475
  ranking, descriptive statistics and, 471–472
  sampling, random, 477–479
  second quartile, with single query, 457–458
  total row, adding, 330–331
  updatable, 335–336

data sources
  queries, 548
  SQL statements, 548
  tables, 548

Data Type drop-down, 43

data types, 43
  Attachment, 42, 48
  AutoNumber, 42, 47, 50
  Calculated, 42, 48
  converting, 52–53
  Currency, 42, 47
  data validation rules, 49
  Date/Time, 42, 46–47, 140
    entering, 540–541
  Hyperlink, 42, 48
  indexed, 44
  Large Number, 42, 46
  Long Text, 42, 45, 141
    entering, 540
  Lookup Wizard, 42, 49
  Number, 42, 45–46, 141
    bytes, 46
    decimal, 46
    double, 46
    integers, 46
    long integers, 46
    replication ID, 46
    single, 46
  OLE Object, 42, 47–48, 141

reports and, 44
  Short Text, 42, 45
  storage requirements, 43
  validation, automatic, 138–140

VBA
  Access field types and, 810–811
  Boolean, 809
  Byte, 809
  Currency, 809
  Date, 809
  Decimal, 809
  Double, 810
  Integer, 810
  Long, 810
  Object, 810
  Single, 810
  String, 810
  Variant, 810
  Yes/No, 42, 47

data validation rules, 49

database engine, 20

Database object (DAO), 907–908
Database Splitter, 232–235
Database Tools, Documenter dialog box, 79–80
Database Tools tab (Ribbon), 24

databases, 3
  blank, 18–20
  compacting, query optimization and, 351
  creating, 18–20
  distribution
    Application Options, 994–999
    Name AutoCorrect options, 1002
    Navigation options, 999–1001
    Ribbon and Toolbar Options, 1001–1002

entity integrity, 71
exporting to, 202–203
flat-file, 91, 102–103
forms, 7, 8
  data-entry forms, 8
  display forms, 8
importing from, 175–178
linking to, 214–216
macros, 7, 9
manual, 4
modules, 7
naming, 19
objects, 7–9
queries, 7, 8
relational databases, 6–7
Index

repairing, query optimization and, 351
reports, 7, 8–9
splitting
  benefits, 229–232
  object location, 232
tables, 7–8
data-entry forms, 8
Datasheet Formatting dialog box, 157–158
datasheet forms, 501–502
Datasheet Ribbon
  Advanced Filter Options button, 133
  Data sheet Formatting button, 133
  Filter by Selection button, 133
Home tab, 133
  Clipboard group, 134
  Find group, 134
  Records group, 134
  Sort & Filter group, 134
  Text Formatting group, 135
  Views group, 134
  Window group, 134
Table Tools group, 136
Datasheet view, 130, 490, 534
linked data, external, 213
queries, 131
switching to, 543–544
tables, 131
Datasheet window, 131–132
copy and paste, 148–149
entering data, 135–137
fields
  properties, 136
  validation rules, 136
filtering
  by form, 164–165
  selections, 161–164
Find and Replace, 143–146
navigating, 132
  moving between records, 143
  to specific values, 143–146
Navigation buttons, 133
new record indicator, 136
opening datasheets, 135
records
  adding, 150
  deleting, 150–151
  saving, 138
  sorting, 161
rows, new, 136–137
values, editing, 146–148
datasheets, 5, 130
alignment, 158
color, 156–158
columns, 5–6, 158
  freezing, 159–160
  hiding/unhiding, 158–159
  width, 153–154
copy and paste, 148–149
custom, 131
display, 152–160
editing, 146
  keystrokes, 147
  values, 146–148
fields, 5–6, 131
  column width, 153–154
  navigating, 536
  order, 152–153
filtering
  by form, 164–165
  selections, 161–164
fonts, 155–156
gridlines, 156–158
layouts, saving, 160
navigating, 132, 142–146
opening, 135
records, 5–6
  adding, 150
  deleting, 150–151
  filtering by form, 164–165
  filtering by selection, 161–164
previewing, 167
printing, 166–167
saving, 138, 160
  sorting, 161
rows
  color, 156–158
  height, 154–155
  new, 136–137
  tables, 131
Date( ) function, 576
date and time
  age in years calculation, 394–396
data type, 42
days past, 393
forms, 576–577
  quarters, 400–401
Date and Time command, 576
Date and Time dialog box, 576–577
Date calculations, 392
  age in years, 394–396
Date function, 393–396
DateAdd function, 399–400
DateSerial function, 401–403
Day function, 397–399
  days past, 393
Month function, 397–399
quarters, 400–401
Weekday function, 397–399
workdays, 398–399
Year function, 397–399
date criteria, domain aggregate functions, 463
Date data type (VBA), 809
Date function
  age in years, 394–396
  days past, 393
  in expressions, 394
Date Picker control, 541
DateAdd function, 399–400
DateSerial function, 401–403
Date/Time data type, 42, 46–47
  data entry, 540–541
  properties and, 140
DAvg function, 460
Day function, 397–399
DBEngine object (DAO), 905
Db1Click event, 847, 849, 852
DBMS (database management system), 4
DCount function, 460, 465–466
Deactivate event, 849, 853
Debug window, 880–881
debugging, 865
  application testing, 867–868
    code compiling, 871–873
    functions, 868–871
  Auto Data Tips, 886–887
  breakpoints, 881–887
  Call Stack window, 892–893
  compiler directives, 875–878
  Debug window and, 880–881
  Err object, 896–897
echo handling, procedures, 897–898
error trapping
    On Error GoTo 0, 895
    On Error GoTo Label, 895
    On Error Resume Next, 893–894
    Resume keyword, 896
Immediate window and, 880–881
Locals window, 887–888
macros, 733–734
Stop statements, 883–884
techniques
  Debug.Print, 878–879
  MsgBox, 874–875
  Watches window, 889–890
  conditional watches, 891–892
Debug.Print, 878–879
Decimal data type (VBA), 809
Decimal Places property, 54
decomposition, 97–98
Default Value property, 54
  Continuous Forms option, 548
  Datasheet option, 548
  Single Form option, 548
  Split Form option, 548
Default View property, 550
Delete event, 850
delete queries, 323–326
  subqueries, 456
DeleteRecord action, 749
deleting
  records, 150–151
  relationships, 126
tables, 82
deletion anomalies, 100
delimited text files, importing, 185–188
denormalization, 101–102
descriptive statistics, 469
group queries and, 470–471
data sets
  median, 475–477
  mode, 472–475
  random sampling, 477–479
  frequency distribution, 483–486
  percentile calculation, 479–481
  quartile calculation, 481–483
  ranking records, 471–472
design
  data design, 11–13
  five-step method, 9–16
forms, 16, 589
  appearance, 596–597
  behavior, 593–595
  check box tally, 573
  combo boxes, 574–575
  control order, 597
control placement, 596
list boxes, 574–575
properties, 593–594
saving records, 595
Tab Stop property, 573
value lookup, data entry and, 594–595
overall design, 10
report design, 11
banded approach, 622–628
tables, 13–16
Design tab
Controls group, 504–506
Delete Rows, 40, 51
Header/Footer Group, Date and Time command, 576
Indexes, 41
Insert Rows, 40, 51
Primary key, 39
Property Sheet, 40
Themes group, 612–614
colors, 614–616
Design view, 34–35, 490, 534
control properties, 564
form resize, 502–503
null values, 389
reports, 619–620, 631
designing tables, 34–39
designs, forms, subforms, 590–593
Detail section (reports), 624, 626
DFirst function, 461
dialog boxes
Choose Builder, 735
Column Width, 153–154
Create New Theme Colors, 614–615
Create New Theme Fonts, 616
Datasheet Formatting, 157–158
Date and Time, 576–577
Documenter, 79–80
Edit Relationships, 120
Enter Parameter Value, 407
Export - HTML Document, 198
Export XML, 192–193
Field Width, 153–154
Find and Replace, 143–146, 148–149
Grouping Intervals, 607
Indexes, 76–77
information collection and, 586–589
Join Properties, 121–122
Link Specification, 222
modal, 241
Page Setup, 632–633
Paste Table As, 361
Print, 166–167
Print Table Definition, 79–80
queries, 586–587
Cancel button, 589
command buttons, 587–588
control menu, removing, 589
default button, 588
properties, 587
Row Height, 154–155
Show Table, 119–120, 241–242
Summary Options, 608–609
Unhide Columns, 159
Zoom, 540
DIB images, 578
digital certificates, 711–712
digital signatures, 711–712
Dim keyword, 807
Dirty event, 850, 852
display forms, 8
Display When property, 558
DISTINCT predicate (SQL), 432
subqueries, 447
Dividing Lines property, 550
DLast function, 461
DLookup function, 461, 466–468
DMax function, 461
DMin function, 461
DoCmd, 762
Documenter dialog box, 79–80
documents
HTML, importing, 197–198
XML, importing/exporting, 192–197
domain aggregate functions, 445
aggregate queries and, 459
anatomy of, 460
DAvg, 460
DCount, 460, 465–466
DFirst, 461
DLast, 461
DLookup, 461, 466–468
DMax, 461
DMin, 461
DStDev, 461
DStDevP, 461
DSum, 460
DVar, 461
DVarP, 461
domain aggregate functions (continued)
syntax, 461
date criteria, 463
number criteria, 462
text criteria, 462
Double data type (VBA), 810
drop-down lists, Data Type, 43
DropDown Ribbon control, 985–987
DStDev function, 461
DStDevP function, 461
DSum function, 460
duplicate records
  defining, 356
  hiding, 665–668
  locating, 357–359
  removing, 359–361
DVar function, 461
DVarP function, 461
Dynamic recordset type, 911
Dynaset recordset type, 911

E
edge cases, 871
Edit Relationships dialog box, 120
editing, datasheet values
  keystrokes, 147
  uneditable fields, 148
embedded macros, 734–736
empty fields, filling in, 363–364
Enforce Referential Integrity checkbox, 120, 123–124
Enter event, 852
Enter Parameter Value dialog box, 407
entity integrity, 71, 114
Error event, 850, 853
error handling, 728–729
  debugging and, 897–898
  MacroError object, 732–733
  OnError action, 730–732
Euro format, 56
event procedures
  creating, 845–846
  record deletion, 862–864
  running at form closure, 862
  templates, 846
  writing, 858–864
events, 843–844
  Activate, 849, 853
  AfterDelConfirm, 850
  AfterInsert, 850
  AfterUpdate, 850, 852
  ApplyFilter, 850
  BeforeDelConfirm, 850
  BeforeInsert, 850
  BeforeScreenTip, 849
  BeforeUpdate, 850, 852
  Change, 852
  Click, 844, 847, 849, 852
  Close, 849, 853
  common, 847–856
  control events, 851–853
    writing, 858–864
  controls, 851–853
  Current, 850
data events, 844
  DblClick, 847, 849, 852
  Deactivate, 849, 853
  Delete, 850
  Dirty, 850, 852
  Enter, 852
  Error, 850, 853
  error and timing events, 844
  Exit, 852
  Filter, 850
  focus events, 844
  form events
    data events, 850–851
    essential events, 848–849
    keyboard events, 849–850
    mouse events, 849–850
    writing, 858–864
  Format, 854
  forms, 848–849
    data events, 850–851
    keyboard, 848–849
    mouse, 848–849
  GotFocus, 849, 852
  keyboard events, 844
  KeyDown, 847, 849, 852
  KeyPress, 847, 849, 852
  KeyUp, 847, 849, 852
  Load, 849
  LostFocus, 849, 852
  macros, assigning, 708–709
  mouse events, 844
  MouseDown, 844, 847, 849, 852
  MouseMove, 847, 849, 852
  MouseUp, 844, 847, 849, 852
MouseWheel, 847, 849
NoData, 853
NotInList, 852
OnClick, 844
OnMouseDown, 844
OnMouseUp, 844
Open, 849, 853
Page, 853
Print, 854
print events, 844
procedures, creating, 845–846
programming, 844–846
programming events, 844
record deletion, 862–864
report events, 853–854
section events, 854–856
report section, 854–856
reports, 844–845, 853–854
Resize, 849
Retreat, 854
sequence, 856–858
table events
   AfterDelete, 744–745
   AfterInsert, 744–745
   AfterUpdate, 744–745
   BeforeChange, 743
   BeforeDelete, 744
   BeforeUpdate, 743
Timer, 849
Undo, 850, 852
Unload, 849
Updated, 852
VBA code, 844–845
VBA code triggers, 844–845
windows events, 844
Excel
   linking to, 218–220
   spreadsheets, importing from, 178–184
exclamation point (!), parameter queries, 408
Exit event, 852
ExitForEachRecord action, 749–750
explicit variables, 811–812
Export - HTML Document dialog box, 198
Export XML dialog box, 192–193
exporting, 169–170. See also data
data, 171
   when to, 173
to databases, 202–203
External Data tab, 174–175
External Data tab (Ribbon), 174–175
   linking to, 170, 171–172
   ODBC drivers and, 203–205
   publishing to PDF, 206–208
   publishing to XPS, 206–208
   to Word, 205–206
   working with, 170
Expression aggregate function, 318–320
Expression Builder, functions, 385–388
expressions, 269
   aggregation results in, 381–382
   constants and, 380
   correlated subqueries as, 455
   Date function, 394
   fields, 381
   group headers, 653–654
   operators, 269
      Boolean (logical), 270, 278–280
      comparison, 270, 273–274
      mathematical, 270, 271–272
      miscellaneous, 270, 280–282
      string, 270, 275–276
      table properties, 270
      subqueries as, 452–453
      Switch function, 420
      syntax, 291
      update queries, 334–335
external data
data, 171
   when to, 173
   linking, 210–211
   to Excel, 218–220
   to HTML files, 220–222
   to ODBC sources, 216–217
   to text files, 222–225
External Data tab
   Export group, 174–175
   Import & Link group, New Data Source drop-down,
      174
External Data tab (Ribbon), 24
external files, 42
F
Fast Laser Printing property, 556
Fetch Defaults property, 555
field list, controls and, 508–511
field objects, 903
Field Size property, 54
Field Width dialog box, 153–154
fields, 5–6
  adding, 35
  attachment fields, 84–85
  augmenting, 366–367
  blank, filling in, 363–364
  calculations, 42
  in calculations, 381
  Cascade Related Fields check box, 124
  concatenation, 364–365
  data types, 42
  data validation rules, 49
  datasheets, 131
  deleting, 35, 51
  description, entering, 49
  editing, uneditable fields, 148
  empty values, filling in, 363–364
  inserting, 51
  key fields
    foreign, 15
    primary, 15
  moving, 51
  names, parameter queries, 407
  naming, 41
  navigating, 536
  ordering, 152–153
  properties, 53
    Allow Zero Length, 54
    Caption, 54
    Decimal Places, 54
    Default Value, 54
    Field Size, 54
    Format, 54, 55–60
    IME Mode, 55
    IME Sentence Mode, 55
    Indexed, 54
    Input Mask, 54
    New Values, 54
    Required, 54
    Unicode Compression, 54–55
    Validation Rule, 54
    Validation Text, 54
queries
  deleting, 249
  hiding, 250
  inserting, 249
  multiple, 245–246
  ordering, 248–249
  selecting, QBD grid, 247–248
single, 244–245
  sort order, 250–252
renaming, 51–52
reports, adding, 633–634
size, 52
  tblCustomers, properties, 68–71
width, 153–154
Fields tab, 37
File Name box, blank databases, 19
File tab (Ribbon), 24
files
  external, 42
  formats, 20
Filter by Form button, 164–165
Filter By Group option, 21
Filter event, 850
Filter On Load property, 554
Filter property, 554, 582–583
filtering
  Filter By Group option, 21
forms
  with code, 945–946
  with queries, 947–953
Find and Replace dialog box, 143–145, 370
  Match Case check box, 145
  Match drop-down list, 145
  replacing values, 148–149
  Search Fields as Formatted check box, 145
Find Duplicates Query Wizard, 357–358
Find group, 535
  Datasheet Ribbon, 134
First aggregate function, 317
Fixed format, 56
text-width text files
  importing, 188–192
  linking to, 222
flat-file databases, 91, 102–103
FlexFormat( ) function, 686
fonts, formatting, 155–156
footers, 556
Force New Page property, 670–671
foreign keys, 95
  child tables, 116
  referential integrity and, 113
Form command, 491, 493–492
Form Design command, 491, 492, 589
form events
data events
  AfterDelConfirm, 850
AfterInsert, 850
AfterUpdate, 850
ApplyFilter, 850
BeforeDelConfirm, 850
BeforeInsert, 850
BeforeUpdate, 850
Current, 850
Delete, 850
Dirty, 850
Error, 850
Filter, 850
Undo, 850

essential events, 848–849
Activate, 849
BeforeScreenTip, 849
Close, 849
Deactivate, 849
GotFocus, 849
Load, 849
LostFocus, 849
Open, 849
Resize, 849
Timer, 849
Unload, 849

keyboard events
KeyDown, 849
KeyPress, 849
KeyUp, 849

mouse events
Click, 849
Db1rClick, 849
MouseDown, 849
MouseMove, 849
MouseUp, 849
MouseWheel, 849

writing, 858–864

Form view, 490, 532, 534
Form Wizard, 491, 492–495
Format event, 854
Format Painter, 579
format properties
Allow Datasheet View, 550
Allow Form View, 550
Allow Layout View, 550
Auto Center, 550
Auto Resize, 550
Border Style, 551
Caption, 550
Close Button, 551
Control Box, 551
Default View, 550
Dividing Lines, 550
Grid X, 552
Grid Y, 552
Layout for Print, 553
Min Max Buttons, 551
Moveable, 553
Navigation Buttons, 550
Navigation Caption, 554
Orientation, 553
Palette Source, 553
Picture, 551
Picture Alignment, 552
Picture Size Mode, 552
Picture Tiling, 552
Picture Type, 551
Record Selectors, 550
Save Splitter Bar Position, 554
Scroll Bars, 550
Split From Datasheet, 553
Split From Orientation, 553
Split From Printing, 554
Split From Size, 554
Split From Splitter Bar, 553
Subdatasheet Expanded, 553
Subdatasheet Height, 553
Width, 551

Format property, 54
Currency, 55–56
currency fields, 55–56
custom numeric, 56–57
Date/Time, 57–58
Euro, 56
Fixed, 56
Hyperlink, 60
Long Text, 58–59
Number, 55
Number fields, 55–56
Percent, 56
Scientific, 56
Short Text, 58–59
Standard, 56
Yes/No, 59–60

formats
Print Preview, 618–619
report data
bullet lists, 674–676
numbered lists, 671–675
Index

formats (continued)
reports, 618–619
text boxes, 686
forms, 7
blank, 491
bound forms, 547–548
closing
  event procedures, 862
  event procedures and, 862
combo boxes, unbound, 937–944
controls, 16, 503–504
  adding, 506–511
  attachment, 505
  bound controls, 506
  bound object frame, 505
  button, 505
  calculated controls, 506
  chart, 505
  check box, 505
  combo box, 505
  editing, 538
  field list, 508–511
  image, 505
  insert page break, 505
  label, 504
  line, 505
  link, 505
  list box, 505
  navigation control, 505
  option button, 505
  option group, 505
  order, 507
  placement, 596
  placing, 589–590
  rectangle, 505
  subform/subreport, 505
  Tab, 583–586
  tab control, 505
  text box, 504
  toggle button, 505
  unbound controls, 506
  unbound object frame, 505
  web browser control, 505
creating, 491–495
  Form Design, 589
data properties
  Allow Additions, 555
  Allow Deletions, 554
  Allow Edits, 554
  Allow Filters, 554
  Data Entry, 555
  Fetch Defaults, 555
  Filter, 554
  Filter On Load, 554
  Order By, 554
  Order By On Load, 554
  Record Locks, 555
  Record Source, 554
  Recordset Type, 555
data-entry forms, 8
datasheet forms, 501-502
Datasheet item, 491
Datasheet view, 490
Date( ) function, 576
date and time, 576–577
design, 16, 589
  appearance, 596–597
  behavior, 593–595
  check box tally, 573
  combo boxes, 574–575
  control order, 597
  control placement, 596
  form properties, 593–594
  list boxes, 574–575
  saving records, 595
  Tab Stop property, 573
  value lookup, data entry and, 594–595
Design view, 490
dialog forms, 587–589
display forms, 8
events, 848–849
  data events, 850–851
  keyboard, 849
  mouse, 849
  Filter property, 582–583
filtering
  with code, 945–946
  with queries, 947–953
filtering by, 161–164
footers, 556
Form command, 492
Form Design, 491
Form view, 490
Form Wizard, 491, 492–495
Format Painter and, 579
format properties
  Allow Datasheet View, 550
  Allow Form View, 550
Allow Layout View, 550
Auto Center, 550
Auto Resize, 550
Border Style, 551
Caption, 550
Close Button, 551
Control Box, 551
Default View, 550
Dividing Lines, 550
Grid X, 552
Grid Y, 552
Layout for Print, 553
Min Max Buttons, 551
Moveable, 553
Navigation Buttons, 550
Navigation Caption, 554
Orientation, 553
Palette Source, 553
Picture, 551
Picture Alignment, 552
Picture Size Mode, 552
Picture Tiling, 552
Picture Type, 551
Record Selectors, 550
Save Splitter Bar Position, 554
Scroll Bars, 550
Split From Datasheet, 553
Split From Orientation, 553
Split From Printing, 554
Split From Size, 554
Split From Splitter Bar, 553
Subdatasheet Expanded, 553
Subdatasheet Height, 553
Width, 551
headers, 556
images, 577–578
  background pictures, 580–582
importing, 198–200
layout, 495
  columnar, 495
  control properties, 558
  control text, 560
  Field List, 561–562
  tab order, 559–560
Layout view, 490
multiple-item forms, 498–500
Navigation form, 491
navigation forms, 496–498
OLE objects, 538–539
opening
  with event procedure, 859–861
  event procedures, 859–861
page numbers, 576–577
pictures in, 538–539
printing, 544–545
properties
  bound forms, 547–548
  Caption property, 546–547
  Cycle, 555
  Default Value, 548
  Fast Laser Printing, 556
  form other properties, 555–556
  format properties, 550–554
  Has Module, 556
  Modal, 555
  Picture, 580–581
  Pop Up, 555
  Property Sheet, 545
  Record Selectors, 549
  Ribbon Name, 556
  Shortcut Menu, 556
  Shortcut Menu Bar, 556
  Tag, 556
  Use Default Paper Size, 556
  viewing form, 548
purpose, 603
records, limiting those shown, 582–583
reports, converting to, 562
  versus reports, 603
resizing form area, 502–503
Ribbons, 989–990
ScreenTips, 580
section properties
  Back Color, 557
  Display When, 558
  Height, 557
  printing properties, 558
  Special Effect, 557
  Visible, 557
sizing, 502–503
split forms, 491, 500–501
subforms
  adding, 591–593
  aggregate information, 572–573
  creating, 590–591
  LinkChildFields property, 572
  LinkMasterFields property, 572
switchboards, 489
forms (continued)
   title bar text, 546–547
   values, editing, 537–538
views, 489–490
   Datasheet, 490
   Design, 490
   Form, 490
   Layout, 490
Forms group, 490–491
   Blank Form command, 491
   Form command, 491
   Form Design command, 491
   Form Wizard, 491
More Forms command
   Datasheet item, 491
   Modal Dialog item, 491
   Multiple Items item, 491
   Split Form item, 491
Navigation Form, 491
Forward Only recordset type, 911
freezing columns, 159–160
frequency distribution, descriptive statistics and,
   483–486
frmIndexTest, 47
FROM clause (SQL), 427
functions, 637
   aggregate
      Avg, 316
      Count, 317
      domain aggregate functions, 445
      Expression, 318–320
      First, 317
      Group By, 312, 315–316
      Last, 317
      Max, 317
      Min, 317
      StDev, 317
      Sum, 316
      Var, 317
      Where, 318–320
arguments
   calculations as, 381–382
   parameters as, 411–414
arrays
   Array, 826–827
   boundaries, 826
   Join, 828–829
   Split, 827–828
   Count(), 701
Date, 393–396
Date (), 576
DateAdd, 399–400
DateSerial, 401–403
Day, 397–399
domain aggregate functions, 460, 461
   date criteria, 463
   DAvg, 460
   DCount, 460, 465–466
   DFirst, 461
   DLast, 461
   DLookup, 461, 466–468
   DMax, 461
   DMin, 461
   DStDev, 461
   DStDevP, 461
   DSum, 460, 462–463
   DVar, 461
   DVarP, 461
   number criteria, 462
   percent of total calculations, 463–464
   running counts, 465–466
   text criteria, 462
   value from previous record, 466–468
FlexFormat (), 686
If, 414–420
Month, 397–399
Now (), 762
Partition, 483–486
Replace, 370
Rnd, 477–479
String, 686
Sum (), 699
Switch, 420–423
testing, 868–871
VBA, 769–770
   calling, 836–838
   creating, 835–840
   parameters, 836
   sales tax calculation, 838–840
Weekday, 397–399
Year, 397–399

G

Gallery Ribbon control, 958
GIF images, 578
GotFocus event, 849, 852
graph data, 42
Grid X property, 552
Grid Y property, 552
gridlines
  displaying, 156–158
  dragging, 155
Group By aggregate function, 312, 315–316
GROUP BY clause (SQL), 432
Group Footer section (reports), 624
Group Header section (reports), 624
group-by queries, 311. See also aggregate queries
Grouping Intervals dialog box, 607
  groups
    reports
      alphabetical, 658–662
      by date, 662–665
      defining groups, 607
      headers/footers, 645–647
      levels, 606–607
      page numbers, 670–671
      removing, 648
      sorting, 647–650
  Tables, 36

H
Has Module property, 556
Header/Footer group, Date and Time command, 576
  headers, 556
Height property, 557
help, ScreenTips, 580
Help tab (Ribbon), 24
Hide Duplicates property, 668
  hiding
    controls, 677
    page headers, 668–670
    repeating information, 665–668
Home tab (Ribbon), 24, 532–533
  Clipboard group
    Copy option, 535
    Cut option, 535
    Format Painter option, 535
    Paste command, 534
Datasheet Ribbon
  Clipboard group, 134
  Find group, 134
  Records group, 134
  Sort & Filter group, 134
  Text Formatting group, 135
  Views group, 134
  Window group, 134
Find group, 535
Records group, 535
Sort & Filter group, 535
Text Formatting group, 536
Views group, 534
Window group
  Size to Fit Form, 535
  Switch Windows, 536
HTML documents
  importing, 197–198
  linking to, 220–222
Hyperlink data type, 42, 48

I
ICO images, 578
IF function
  arguments, 414
  crosstab analysis, 419–420
  mathematical errors avoidance, 415–416
  nesting, multiple conditions and, 418
  saving steps, 416–418
Image control, 577–578
images
  background pictures, 580–582
  BMP, 578, 581
  DIB, 578
  forms, 577–578
  GIF, 578
  ICO, 578
  JPG, 578
  PCX, 578
  PNG, 578
  TIF, 578
  WMF, 578
IME Mode property, 55
IME Sentence Mode property, 55
Immediate window (VBE), 792–793, 880–881
implicit variables, 811–812
Import Spreadsheet Wizard, 181
Import Text Wizard, 186–187
importing
  Access objects, 198–200
  from Access databases, 175–178
data, 170
    when to use, 172
  from Excel spreadsheets, 178–184
importing (continued)
  forms, 198–200
  HTML documents, 197–198
  macros, 198–200
  modules, 198–200
  Outlook folders, 200–202
  queries, 198–200
  reports, 198–200
  SharePoint lists, 185
  tables, 198–200
  from text files, 185–192
  XML documents, 192–197
IN operator, 451
IN operator, 281, 299–300
Indexed property, 54, 66–68
Indexes dialog box, 76–77
indexing tables, 73–74
  composite indexes, 76–78
  entry order, 74
  frmIndexTest, 47
  multiple-field indexes, 76–78
  natural order, 74
  physical order, 74
  properties, 77–78
  simple indexes, 74
  when to index, 78–79
inferential statistics, 469
information collection, dialog boxes, 586–589
inner joins, 121, 262–263, 428–429
Input Mask property, 60–63
Input Mask wizard, 62–63
insertion anomalies, 100
Integer data type (VBA), 81
invoice reports, 9
Is operator, 282
J
JET engine (Joint Engine Technology), 20, 901
Join function, 828–829
Join Properties dialog box, 121–122
join tables, 32
  many-to-many relationships, 32
joins
  inner joins, 121, 428–429
  outer joins, 121
  left joins, 429
  right joins, 429
queries
  ad hoc, 265–266
  deleting, 267
  inner join, 262–263
  left outer join, 263
  right outer join, 264
  types, specifying, 266–267
JPG images, 578
K
key fields
  foreign keys, 15
  primary keys, 15
keyboard events, 848–849
keyboard shortcuts, editing datasheet values, 147
KeyDown event, 847, 849, 852
KeyPress event, 847, 849, 852
keys, 113–114
KeyUp event, 847, 849, 852
L
Label control
  cutting, 638–639
  deleting, 638–639
  moving, 640–642
  pasting to section, 640
  properties, 643–644
  sizing, 637–638
Label Ribbon control, 980–982
labels, controls
  naming, 527–529
  reattaching, 522–523
Large Number data type, 42, 46
Last aggregate function, 317
layout
  columnar, 495
  reports, 604, 608–609
  Layout for Print property, 553
  Layout view, 490, 534
  layouts, saving, 160
left outer joins, 263
Like operator (SQL)
  selection methods, 430–431
  wildcards, 430
Like string operator, 276–277
  select criteria, 291–294
  wildcards, 277–278, 294
Line method, 681
Link Specification dialog box, 222
Link Spreadsheet Wizard, 220
linked data, limitations, 213–214
Linked Table Manager, 210, 228
linked tables, 211–213
  information, editing, 227–228
  optimization, 226–227
  properties, view, 225–226
  queries, 212
  references, deleting, 227
  refreshing, 228–229
  relationships, 226
linking
to databases, 214–216
to Excel, 218–220
to external data, 210–211
to external data, 170
  when to use, 171–172
to HTML files, 220–222
to ODBC sources, 216–217
to text files, 222–225
List Box control, 568
  Bound Column property, 569
  Column Count property, 569
  Column Heads property, 569
  Column Widths property, 569
  Limit To List property, 569
  List Rows property, 569
  List Width property, 569
  Multi Select property, 570
  Row Source property, 569
  Row Source Type property, 569
  Validation Rule property, 569
  Validation Text property, 569
list boxes, 542–543
lists
  bulleted lists, 674–676
  numbered lists, 671–675
Load event, 849
Locals window, debugging and, 887–888
LogEvent action, 750
logical operators
  And, 278–279
  Not, 280
  Or, 279–280
logical values, 42
Long data type (VBA), 810
Long Text data type, 42, 45, 141
data entry, 540
Lookup Wizard data type, 42, 49
LostFocus event, 849, 852

M
Macro Builder, 706–707
  Action Catalog, 747
    data actions, 749–751
    data blocks, 748–749
    macro groups, 748
    program flow, 748
    data macros, 745–747
macros, 7, 9, 705–706. See also data macros; VBA (Visual Basic for Applications)
  arguments, 706
  Beep, 707
  Message, 707
  Title, 707
  Type, 707
  conditions, 720–722
    multiple actions in, 723
  converting to VBA, 737–739
  creating, 706–708
  debugging, 728, 733–734
  embedded, 734–736
  error handling, 728–729
    MacoError object, 732–733
    OnError action, 730–732
  events, assigning to, 708–709
  importing, 198–200
  limitations, 759–760
  mcrBackupContractsAndProducts, 713–716
  mcrMainMenu, 716–720
  mcrReportMenu, 721–722
  multi-action, 713–716
  security, 709–710
    sandbox mode, 710–712
    Trust Center, 712–713
  submacros, 716–720
  variables, temporary, 723–728
  versus VBA, 736–737
Macros & Code group, Macro button, 706–707
mailing label reports, 600, 602–603
make-table queries, 321–323
  removing duplicate records, 362
subqueries, 456
manual databases, 4
many-to-many relationships, 32, 103–104, 108–110
mathematical operators, 270
  + (addition), 270, 271
  / (division), 270, 271
  ^ (exponentiation), 270
  \ (integer division), 270, 271–272
Index

mathematical operators *(continued)*
   * (multiplication), 270, 271
   - (subtraction), 270, 271
   ^ (exponentiation) operator, 272
   Mod (modulo), 270, 272
   precedence, 282–283
Max aggregate function, 317
mcrBackupContractsAndProducts macro, 713–716
mcrMainMenu macro, 716–720
mcrReportMenu macro, 721–722
median, data sets, descriptive statistics and, 475–477
Menu Ribbon control, 957–958
methods
   objects, 903
   OpenDatabase, 907–908
Microsoft Word Mail Merge Wizard, 206
Min aggregate function, 317
Min Max Buttons property, 551
miscellaneous operators, 270
In, 281
Between...And, 281, 408
Is, 282
Mod (modulo) mathematical operator, 270, 272
modal dialogs, 241, 491
Modal property, 555
mode, data sets, descriptive statistics and, 472–475
modules, 7
   importing, 198–200
monetary data, 42
Month function, 397–399
mouse events, 848–849
MouseDown event, 844, 847, 849, 852
MouseMove event, 847, 849, 852
MouseUp event, 844, 847, 849, 852
MouseWheel event, 847, 849
Moveable property, 553
multi-action macros, 713–716
multiple-item forms, 498–500
naming conventions, 33–34
natural primary keys, 118–119
navigation
   datasheets, 132, 536
   Find and Replace, 143–146
   forms, records, 537
   between records, 143
   to specific values, 143–146
Navigation buttons, 133
Navigation Buttons property, 550
Navigation Caption property, 554
Navigation form, 491
navigation forms, 496–498
Navigation pane, 20
   Created Date option, 23
   Custom option, 21–22
   Filter By Group, 21
   Modified Date option, 23
   Navigate To Category, 21
   Object Type option, 22
   Tables and Related Views option, 23
New Values property, 54
NoData event, 853
normalization, 6
   1NF (first normal form), 90–93
   2NF (second normal form), 94
   entities, 94–98
   exceptions, 98–99
   3NF (third normal form), 99–100
   query optimization and, 349
NOT IN operator, 451
Not Like string operator, 276–277
Not operator, 280
NotInList event, 852
Now( ) function, 762
null values, 302–304, 363–364
   calculations and, 389–391
number criteria, domain aggregate functions, 463
Number data type, 42, 45–46, 141
   bytes, 46
   decimal, 46
   double, 46
   integers, 46
   long integers, 46
   replication ID, 46
   single, 46
Number format, 55
numbered lists, 671–675
numbers, increments, 42
numeric data, 42

N
Name AutoCorrect, 33, 35
names
   columns, aliases, 314–315
   control labels, 527–529
   controls, 701
   fields, 41, 51–52
   variables, 803–804
   conventions, 813–815
O
Object Browser (VBE), 794, 903–904
  Options dialog box, Editor tab, 797–797
Object data type (VBA), 810
object tables, 31–32
object types, 691
objects. See also DAO (Data Access Objects)
  adding, 35
  collections, 786–788, 903
    Properties collection, 903
  field, 903
  methods, 903
  recordset, 903
ODBC (Open Database Connectivity) standard, 901
  drivers, exports and, 203–205
  linking to sources, 216–217
Office Backstage view, 25
OLE Object data type, 42, 47–48, 141
OLE Objects, in forms, 538–539
OnClick event, 844
OnError action, 751
one-to-many relationships, 103–104, 107–108
one-to-one relationships, 103–107
OnMouseDown event, 844
OnMouseUp event, 844
Open event, 849, 853
Open Other Files hyperlink, 17
OpenDatabase method, 907–908
operands, 269
operators, 269
    IN, 451
    Boolean (logical), 270, 278–280
    comparison, 270, 273–274
      subqueries, 451–462
    mathematical, 270, 271–272
    miscellaneous, 270, 280–282
    NOT IN, 451
    precedence
      Boolean operators, 283
      comparison operators, 283
      mathematical operators, 282–283
    precedence, calculations and, 388–389
    queries, parameter queries, 408–409
    string, 270, 275–276
    table properties, 270
Option Group control
    Control Source property, 570
    Default Value property, 570
    Frame Control property, 570
    Option Value property, 570
option groups, 542
Options dialog box (VBE), 795
  Auto Data Tips, 797
  Auto Indent, 796
  Auto List Members, 797
  Auto Quick Info, 797
  Auto Syntax Check, 796
  Require Variable Declaration, 796
Or operator, 279–280, 297
  across fields, 305–307
  multiple values, 298
  QBD pane Or cell, 299
  select criteria, 286–288
ORDER BY clause (SQL), 433
Order By On Load property, 554
Order By property, 554
Organization combo boxes, 575
Orientation property, 553
orphans in relational databases, 113
outer joins, 121
  left, 429
  right, 429
outer queries, 447
Outlook, folders, importing, 200–202
output, reports, 599

P
Page event, 853
Page Footer section (reports), 624, 627
Page Header section (reports), 624, 625–626
page headers, hiding, 668–670
page numbers
  forms, 576–577
  report groups, 670–671
Page property, 670–671
Page Setup dialog box, 632–633
Page Setup tab, reports, 632
Palette Source property, 553
parameter queries, 405–407, 947–949
  ampersand (&), 408
  conditional functions
    IIf function, 414–423
    Switch function, 420–423
  exclamation point (!), 408
  field names, 407
  multiple conditions, 408
  operators and, 408–409
Index

parameter queries (continued)
overview, 407
parameters
as calculation variables, 411
as function arguments, 411–414
partial parameters, 410
period (.), 408
prompts, multiple entries, 412–414
square brackets ([ ]), 406–408
wildcards, 410
parameters, partial, 410
parent table, primary key, 116
parsing strings, character markers, 374–377
Partition function, 483–486
Interval argument, 484
Number argument, 484
Range Start argument, 484
Range Stop argument, 484
pass-through queries, 442–444
Paste Table As dialog box, 361
PCX images, 578
PDF files, 618–619
publishing to, 206–208
Percent format, 56
percentile, descriptive statistics, 479–481
performance, queries, 348–349
period (.) in parameter queries, 408
Picture Alignment property, 552
picture data, 42
Picture property, 551, 580–581
Picture Size Mode property, 552
Picture Tiling property, 552
Picture Type property, 551
pictures, background, 580–582
PNG images, 578
Pop Up property, 555
previewing, records, 167
Primary key button, 72
primary keys, 103–104
AutoNumber data type, 114
benefits, 116–117
composite, 72–73, 117–118
creating, 72, 119
deriving, 115
designating, 117–119
meaningful, 115
natural, 118–119
parent table, 116
referential integrity and, 113
selecting, 71–72, 114–116
single-field, 117–118
surrogate, 72, 118–119
tables, 442
Print dialog box, 166–167
Collate, 544
Copies, 544
Print Range, 544
Print event, 854
Print Preview, 644
formats, 618–619
reports, 611–612
formats, 618–619
Print Table Definition dialog box, 79–80
printing
forms, 544–545
properties, 558
records, 166–167
recordsets, 255–256
reports, 620
even-odd pages, 684
queried data, 692
table designs, 79–81
Private keyword, 808–809
procedures
event procedures, creating, 845–846
VBA, 762–764
calling, 830–831
compiling, 776
creating, 830
declaring, 832
functions, 762
statements, 832
subprocedures, 767–768, 829
subroutines, 761, 829
terminators, 832
variable assignment, 767–769
variable declaration, 767
programming languages, 761
Project Explorer (VBE), 793
Toggle Folders, 794
View Code, 794
View Object, 794
Project Properties dialog box (VBE), 797
conditional compilation, 799
Project Description, 799
Project Name, 798
project protection, 800
prompts, parameters, multiple entries, 412–414
properties, 53, 524
  Allow Zero Length, 54
appearance, 566–567
Caption, 54
controls, 563–564
  customizing, 565–566
Design view, 564
Property Sheet, 565, 566
Text Box, 566–567
data entry and, 567
  Date/Time, 140–141
Long Text, 141–142
Number/Currency, 141
OLE Object, 141
  standard text, 140
Decimal Places, 54
Default Value, 54
dialog forms, 587
Field Size, 54
form design, 593–594
Format, 54, 55–60
forms
  bound forms, 547–548
Caption property, 546–547
Default Value, 548
form other properties, 555–556
format properties, 550–554
Property Sheet, 545
Record Selectors, 549
  viewing, 548
IME Mode, 55
IME Sentence Mode, 55
Indexed, 54
indexed tables, 77–78
Input Mask, 54, 60–63
labels, 643–644
New Values, 54
Required, 54
RibbonName, 989–990
section properties
  Back Color, 557
Display When, 558
Height, 557
Special Effect, 557
Visible, 557
Special Effect, 565–566
Split Form Orientation, 501
Status Bar Text, 532
tblCustomer, 68–71
text boxes, 643–644
Unicode Compression, 54–55
Validation Rule, 54
Validation Text, 54
Properties collection, 903
Property Sheet, 524–525, 545
controls, 565, 566
Data tab, 525
Event tab, 525
Format tab, 525
Label control, 643–644
Text Box control, 643–644
Public keyword, 807–808

Q
QBE (query by example), 8
qryDialog, query design, 587
quartile, descriptive statistics, 481–483
queries, 4, 7, 8, 240
  action queries, 320
    append queries, 327–332, 437
    delete queries, 323–326, 437
    make-table queries, 321–323
    make-tables queries, 436
    update queries, 332–336, 437
aggregate, 311–312
descriptive statistics and, 470–471
calculations, 240
capabilities, 240
columns, resizing, QBD grid, 249
creating, 241–244
criteria, 240
crosstab queries
  creating manual, 342–345
  Crosstab Query Wizard, 336–342
  customizing, 346–348
  TRANSFORM statement (SQL), 437
data sources, 548
Datasheet view, 131
dialog boxes, 586–587
  Cancel button, 589
  command buttons, 587–588
  control menu, removing, 589
default button, 588
properties, 587
fields
  adding, 244–246
deleting, 249
queries (continued)
  field selector, 248
  hiding, 250
  inserting, 249
  multiple, 245–246
  ordering, 248–249
  selecting, 240
  selecting, QBD grid, 247–248
  single, 244–245
  sort order, 250–252
  forms and, 240
  importing, 198–200
  joins
    ad hoc, 265–266
    deleting, 267
    inner join, 262–263
    left outer join, 263
    right outer join, 264
    specifying type, 266–267
  limitations, 260
  linked tables, 212
  parameter queries, 405–407, 947–949
    ampersand (&), 408
    conditional functions, 414–423
    exclamation point (!), 408
    field names, 407
    III function, 414–423
    multiple conditions, 408
    operators and, 408–409
    overview, 407
    parameters as calculation variables, 411
    parameters as function arguments, 411–414
    period (.), 408
    square brackets ([ ]), 406–408
    Switch function, 420–423
  wildcards, 410
  pass-through, 442–444
  performance optimization, 348–349
    compacting database, 351
    database normalization, 349
    inboxes in fields, 349–350
    query design optimization, 350–351
    repairing database, 351
  records, sorting, 240
  recordsets, 241
    printing, 255–256
    in reports, 604–605
  reports and, 240
  running, 247
  saving, 256
  select criteria, 252
    comparison operators, 284–285
    criteria, 285–288
    Date fields, 254
    field references, 289
    functions in, 288
    multiple criteria, 297–304
    Numeric fields, 254
    single-field criterion, 289–297
    string criteria, 252–254
    Yes/No fields, 254
  SQL view, 426
  SQL-specific
    ALTER TABLE statement, 440–442
    column manipulation, 440–442
    CREATE TABLE statement, 440
    data set merges, 438–440
    pass-through queries, 442–444
    table creation, 440
    UNION operator, 438–440
  subqueries, 240, 445
    comparison operators, 451–462
    DISTINCT keyword, 447
    as expressions, 452–453
    NOT IN operator, 451
    IN operator, 451
    outer queries, 447
    Query Design view, 446
    restrictions, 447
    SELECT statement, 447
    SELECT TOP PERCENT statement, 447
    SQL statements, 447–450
    table aliases, 447
    uses, 447
  tables
    creating, 240
    editing, 240
    fields, 258
    multiple, 256–260
    names display, 258
    selecting, 240
    updating rules, 259–260
  Query Design view, 446
    make-table queries, 321–322
    Query Designer, 241
    Query by Design (QBD) grid, 243–244
  table pane
    adding tables, 262
Index

deleting tables, 262
join line, 261
moving tables, 261–262
table/query pane, 242–243
Query Tools Design Ribbon, 244
Query Tools Design tab, Top Values property, 434
QueryDef object (DAO), 909–911
Quick Access toolbar, 25–27, 964
commands, adding, 26, 965
moving items, 966
Undo button, 138, 148

R
RaiseError action, 751
random sampling, data sets, 477–479
ranking columns, 673
RDBMS (relational database management system), 4
Recent (welcome screen), 17
Record Locks property, 555
Record Selectors property, 549, 550
Record Source property, 554, 582–583
bound forms and, 547–548
records, 5–6
adding, 84, 150
blank lines between, 682–684
Datasheet view, 130
new records indicator, 136
deleting, 150–151
duplicate, 355–363
event procedures and, 862–864
duplicate
defining, 356
locating, 357–359
removing, 359–362
filtering
by form, 164–165
by selection, 161–164
forms, limiting those shown, 582–583
navigating, 537
navigating to, 143–146
previewing, 167
printing, 166–167
ranking, descriptive statistics and, 471–472
saving, 138, 160, 544, 595
sorting, 161
Visible property, 677
Records group, 535
Datasheet Ribbon, 134

Recordset object
ADO, 922–923
DAO, 911–916
recordset objects, 903
Recordset Type property, 555
recordsets, 241
counting records, 915–916
Dynamic type, 911
Dynaset type, 911
dead/beginning detection, 914–915
Forward Only type, 911
navigating recordsets, 912–914
printing, 255–256
in reports, 604–605
Snapshot type, 911
specifying type, 912
Table type, 911
types, 911
Dynamic type, 911
Dynaset type, 911
Forward Only type, 911
Snapshot type, 911
Table type, 911

Redo command, Quick Access toolbar, 25
references, select criteria, 288
referential integrity, 110–112
application-specific rules, 126–127
cascade delete related records, 124
cascade related fields, 124
enforcing, 119–125
foreign keys, primary keys and, 113
primary keys
foreign keys and, 113
null value, 112
related tables, 6
relational databases, 6–7
joins
inner joins, 121
outer joins, 121
orphans, 113
referential integrity, 110–112
enforcing, 119–125
foreign key values, 113
primary key null value, 112
relationships, 87–90
deleting, 126
joins
inner joins, 121
outer joins, 121
Index

relationships (continued)
many-to-many, 32, 103–104, 108–110
one-to-many, 103–104, 107–108
one-to-one, 103–107
referential integrity, enforcing, 119–125
relationship creation, 119–125
viewing all, 125
Relationships window, relationship creation, 119–125
renaming tables, 81–82
repeating information, hiding, 665–668
Replace function, 370
Report Builder, Group, Sort, and Total pane
   alphabetical sort, 658–662
date sort, 662–665
Report Designer
   layout, 604
   saving reports, 622
Report Footer section (reports), 624, 627–628
Report Header section (reports), 624, 625
Report Wizard, 599, 605–616
group data, defining, 607
grouping levels, 606–607
layout, 609–610
   adjustments, 611–612
record sort order, 608
report title, 610–611
summary options, 608–609
themes, 612–614
color schemes, 614–616
reports, 7, 8–9, 599
   banded approach, 622–628
   binding to tables, 629–631
   blank lines between, 683–685
color schemes, 614–616
columnar, 600, 601–602
columns
   layout, 697
   number of, 696
   ranking columns, 672
   size, 697
   snaking, 692–696
   spacing, 696
   vertical lines, 680–682
combo boxes, displaying all, 690
controls
   alignment, 687
   micro-adjustments, 687
   modifying appearance, 642
   naming, 701
placing, 633–634
converting to from forms, 562
data
   adding, 688
   assembling, 604–605
   sources, 604–605
data types and, 44
design, 11
Design View, 619–620
Design view, 619–620, 631
duplicates, hiding, 665–668
events, 844–845, 853–854
   Activate, 853
   Close, 853
   Deactivate, 853
   Error, 853
   NoData, 853
   Open, 853
   Page, 853
section events, 854
fields, adding, 633–634
Force New Page property and, 650
formats, 618–619
formatting
   bulleted lists, 675–678
   numbered lists, 671–675
versus forms, 603
group headers, 623
expressions in, 653–654
groups
   alphabetical, 658–662
   by date, 662–665
   defining groups, 607
   headers/tooters, 645–647
   levels, 606–607
   page numbers, 670–671
   removing, 648
   sorting, 647–650
headers, creating, 654–656
importing, 198–200
invoice reports, 9
labels
   alignment, 687
cutting, 638–639
deleting, 638–639
moving, 640–642
pasting to section, 640
properties, 643–644
sizing, 637–638
layout, 604, 609–610, 631–633
  adjustments, 611–612
mailing label, 600, 602–603
new, 605–606
page breaks, 650
page headers, 623, 652–653
  hiding, 668–670
page setup, 631–633
Print Preview, 611–612
  formats, 618–619
printing, 620
  even-odd pages, 685–687
  queried data, 693
Product Display, 629
purpose, 603
records, sort order, 608
recordsets, 604–605
repeated information, hiding, 665–668
report section events, 854–856
Report Wizard, 605–616
rows, spacing, 696
saving, 622
sections, 623
  Detail, 624, 626
  Group Footer, 624
  Group Header, 624
  hiding, 648
  lines, 680–682
  moving controls between, 649–650
  page breaks and, 650
  Page Footer, 624, 627
  Page Header, 624, 625–626
  pasting labels, 640
  Report Footer, 624, 627–628
  Report Header, 624, 625
  resizing, 634–636
  sizing, 648–649
summary options, 608–609
tabular, 600–601, 666
text boxes
  adding, 636
  cutting labels, 638–639
  deleting labels, 638–639
  different formats in, 686
  expressions, 636–637
  functions, 637
  moving, 640–642
  pasting labels, 640
  properties, 643–644
sizing, 637–638
using, 636
themes, 612–614
  color schemes, 614–616
titles, 610–611
  centering, 687
two-pass processing, 699
viewing, 621–622
Required property, 54, 65
Resize event, 849
resizing, form area, 502–503
Retreat event, 854
Ribbon
  Clipboard group, 956
  collapsing, 961
contextual tabs, 24
controls, 956
  Button, 958–959, 982–983
  CheckBox, 960, 983–984
  ComboBox, 960
  DropDown, 985–987
  Gallery, 958
  ImageMso attribute, 979–980
  Label, 980–982
  Menu, 957–958
  separators, 983
  SplitButton, 957, 987–988
  ToggleButton, 959
Create tab, 24, 35, 955
custom, 966–967
  callbacks, 967–969, 972–973
  properties, 975–977
  USysRibbons, 973–975
XML and, 969–972
Database Tools tab, 24, 955
Datasheet Ribbon, 133
  Advanced Filter Options button, 133
  Clipboard group, 134
  Data sheet Formatting button, 133
  Filter by Selection button, 133
  Find group, 134
  Records group, 134
  Sort & Filter group, 134
  Text Formatting group, 135
  Views group, 134
  Window group, 134
default, editing, 961–964
Design tab
  Delete Rows, 40
Index

Ribbon (continued)
  Indexes, 41
  Insert Rows, 40
  Primary key, 39
  Property Sheet, 40
  External Data tab, 24, 955
    Export group, 174–175
    Import & Link group, 174
  Fields tab, 37
  File tab, 24, 955
  Find group, 956
  fonts, changing, 156
  forms, 989–990
  Help tab, 24, 955
  hierarchy, 955–961
  Home tab, 24, 532–537, 955
  Page Setup tab, 632
  Query Tools Design Ribbon, 244
  Records group, 956
  removing, 990–991
  reports, 989–990
  Sort & Filter group, 956
  SuperTips, 960–961
  Text Formatting group, 956
  Views group, 956
  Window group, 956
  XML, 977–979
  Ribbon Designer, 961–964
  Ribbon Name property, 556
  right outer joins, 264
  Rnd function, 477–479
  Row Height dialog box, 154–155
  Row Source
    combo boxes and, 574
    properties, 594–595
  rows
    color, 156–158
    height, 154–155
    new, 136–137
  RunDataMacro action, 750
  Running Sum, 671–672

S
  sampling, random, data sets, 477–479
  sandbox mode, 710–712
  Save command, Quick Access toolbar, 25
  Save Import Steps, 177
  Save Splitter Bar Position property, 554
  Saved Imports, 178
  saving
    layouts, 160
    queries, 256
    records, 138, 160, 544
    reports, 622
    tables, 81
    schema files, XML and, 193
  Scientific format, 56
  ScreenTips, 580
  Scroll Bars property, 550
  second quartile, data sets, 457–458
  sections, reports
    controls, moving between, 649–650
    hiding, 648
    page breaks and, 650
    properties
      Back Color, 557
      Display When, 558
      Height, 557
      Special Effect, 557
      Visible, 557
    resizing, 634–636
    sizing, 648–649
  security
    digital certificates, 711–712
    digital signatures, 711–712
    macros, 709–710
    sandbox mode, 710–712
    Trust Center, 712–713
  select criteria
    Boolean operators, 286
    comparison operators, 284–285
    complex, 285–288
      on different lines, 308–309
    field references, 288
    functions in, 288
    multiple
      And operator, 300–302
      Between...And operator, 302, 408
      In operator, 299–300
      Or operator, 297–299
    multiple fields
      And, 304–305
      Or, 304–305
    null data searches, 302–304
    And operators, 286–288
      with Or operator in different fields, 307–308
      Or operators, 286–288
across fields, 305–307
with And operator in different fields, 307–308
queries, 252
   Date fields, 254
   Numeric fields, 254
   string criteria, 252–254
   Yes/No fields, 254
single-field criterion
   character criteria, 289–291
   Like operator, 291–294
   Memo fields, 289–297
   non-matching values, 294–295
   numeric criteria, 295–296
   OLE objects, 297
   Text fields, 289–297
   true/false criteria, 296–297
   wildcards, 291–294
SELECT statement (SQL)
FROM clause, 427
columns
   selecting all, 427
   selecting specific, 427
subqueries, 447
syntax, 426
UNION operator, 438–440
SELECT TOP PERCENT statement, 436
subqueries, 447
SELECT TOP statement, 433–436
selections, filtering by, 161–164
SendEmail action, 750
separators, Ribbon controls, 983
SetField action, 750
SetLocalVar action, 750
SharePoint, 1039–1041
   Access tables
      exporting to SharePoint, 1051–1054
      moving to SharePoint, 1049–1052
documents, 1040–1041
lists, 1041–1043
   importing, 185, 1046–1047
   linking to, 1043–1046
templates, 1052–1054
Short Text data type, 42, 45
Shortcut Menu Bar property, 556
Shortcut Menu property, 556
Show Table dialog box, 119–120, 241–242
Single data type (VBA), 810
single-field criterion
   Like operator, 291–294
Memo fields, 289–297
non-matching values, 294–295
numeric criteria, 295–296
OLE objects, 297
true/false criteria, 296–297
wildcards, 291–294
single-field primary keys, 117–118
Sizing & Ordering group, 518
snaking columns, 692–696
Snap to Grid command, 518
Snapshot recordset type, 911
Sort & Filter group, 161–162, 535
   Datasheet Ribbon, 134
sound data, 42
Special Effect property, 557, 565–566
Split Form Orientation property, 501
split forms, 500–501
Split From Datasheet property, 553
Split From Orientation property, 553
Split From Printing property, 554
Split From Size property, 554
Split From Splitter Bar property, 553
Split function, 827–828
SplitButton Ribbon control, 957, 987–988
splitting databases
   benefits, 229–232
   Database Splitter, 232–235
   object location, 232
spreadsheets, importing from, 178–184
SQL (Structured Query Language), 8, 425
   clauses
      AS, 433
      GROUP BY, 432
      ORDER BY, 433
      WHERE, 428–429
   DISTINCT predicate, 432
   Like operator
      selection methods, 430–431
      wildcards, 430
   statements
      action queries, 436–437
      ALTER TABLE, 440–442
      column manipulation, 440–442
      CREATE TABLE, 440
      data set merges, 438–440
data sources, 548
   pass-through queries, 442–444
SELECT, 426–427
Index

SQL (Structured Query Language) (continued)
   SELECT TOP, 433–436
   SELECT TOP PERCENT, 436
   subqueries, 447
   table creation, 440
   UNION operator, 438–440
SQL view, queries, 426
square brackets ([ ]), parameter queries, 406, 408
Standard format, 56
statistics
   descriptive, 469
   aggregate queries and, 470–471
   data set median, 475–477
   data set mode, 472–475
   frequency distribution, 483–486
   percentile calculation, 479–481
   quartile calculation, 481–483
   ranking records, 471–472
   inferential, 469
Status Bar Text property, 532
StDev aggregate function, 317
Stop statements, 883–884
StopAllMacros action, 750
StopMacro action, 750
String data type (VBA), 810
String function, 686
string operators, 270
   & (concatenation), 275–276
   Like, 276–277
      wildcards, 277–278
   Not Like, 276–277
strings
   parsing, character markers and, 374–377
   spaces, leading, 368–369
Subdatasheet Expanded property, 553
Subdatasheet Height property, 553
Subform control
   LinkChildFields property, 572
   LinkMasterFields property, 572
Subform Wizard, 591–592
subforms
   adding, 591–593
   aggregate information, 572–573
   creating, 590–591
submacros, 716–720
subqueries, 445
   action queries
      append queries, 456
      delete queries, 456
      make-table queries, 456
      update queries, 456
   comparison operators, 451–462
   correlated, 453–454
      as expressions, 453–454
   DISTINCT keyword, 447
      as expressions, 452–453
   NOT IN operator, 451
   IN operator, 451
   outer queries, 447
   parentheses, 446
   Query Design view, 446
   restrictions, 447
   SELECT statement, 447
   SELECT TOP PERCENT statement, 447
SQL statements, 447–450
   table aliases, 447
   uses, 447
subroutines, VBA, 829
   calling, 829–830
   creating, 831–834
   invoking, 829–830
   running, 829–830
Sum( ) function, 699
Sum aggregate function, 316
Summary Options dialog box, 608–609
SuperTips, 960
surrogate primary keys, 72, 118–119
Switch function
   expressions, 420
   values, 420
switchboards, 489
syntax, expressions, 391

T

Tab control, 583–585
   Caption property, 585
   Multi Row property, 585
   Picture property, 586
   Style property, 585
   Tab Fixed Height property, 585
   Tab Fixed Width property, 586
tabbed windows, 23
tab-delimited text files, importing, 185–188
Table Design button, 37
Table Design window, field names, 41
Table Designer, 37–38
table designs, printing, 79–81
table pane (Query Designer)
   adding tables, 262
deleting tables, 262
join line, 261
moving tables, 261–262
Table recordset type, 911
TableDef object (DAO), 908–909
tables, 4, 5, 7–8
aliases, AS clause, 433
Collectible Mini Cars Customers, 38
columns, ALTER TABLE statement (SQL), 440–442
copying, 82–83
CREATE TABLE statement (SQL), 438–440
creating, 32–33
designing, 34–39
data sources, 548
Datasheet view, 131
datasheets, 131
decomposition, 97–98
deleting, 82
design, 13–16
modifying, 50–68
events, 742–743
AfterDelete, 744–745
AfterInsert, 744–745
AfterUpdate, 744–745
BeforeChange, 743
BeforeDelete, 744
BeforeUpdate, 743
fields
adding, 35
attachment fields, 84–85
data types, 42
deleting, 35, 51
inserting, 51
moving, 51
naming, 41
properties, 53–68
renaming, 51–52
size, 52
foreign keys, 95
importing, 198–200
indexing, 73–74
composite indexes, 76–78
data types, 42
multiple-field indexes, 76–78
natural order, 74
physical order, 74
properties, 77–78
simple indexes, 74
when to index, 78–79
join tables, 32
key fields
foreign keys, 15
primary keys, 15
keys, 113–114
linked, 211–213
editing information, 227–228
optimization, 226–227
properties, 225–226
reference deletion, 227
relationships, 226
modifying, 35
multiple, 7
object tables, 31–32
primary keys, 103–104, 442
composite, 72–73
creating, 72
selecting, 71–72
Print Table Definition, 79–80
queries
fields, 258
multiple, 256–260
names display, 258
records
adding, 84
deleting based on other tables, 335–336
related, 6
relationships, 87–90
flat-file databases, 102–103
renaming, 81–82
reports, binding, 629–631
Ribbons, 989–990
saving, 81
Tables group, 36
tabular reports, 600–601, 666
blank lines, 682–684
Tag property, 556
tblBookOrders table, 91–98
tblCustomers
AutoNumber fields, 50
data types, 49–50
fields, properties, 68–71
templates
event procedures, 846
SharePoint, 1052–1054
testing applications, debugging and, 867–873
text
Find and Replace, 370
inserting, strings and, 370–374
Status Bar Text, 532
Text Box control
Back Color property, 566–567
Back Style property, 566–567
Border Style property, 566–567
Border Width property, 566–567
Can Grow property, 644–645
Can Shrink property, 644–645
cutting labels, 638–639
Default Value property, 567
deleting labels, 638–639
Font Italic property, 567
Font Name property, 567
Font Size property, 567
Font Underline property, 567
Font Weight property, 567
Fore Color property, 567
Format property, 566
functions, 637
Input Mask property, 567
moving, 640–642
pasting labels, 640
properties, 643–644
sizing, 637–638, 644–645
Special Effect property, 566–567
Text Align property, 567
Text Format property, 567
Validation Rule property, 567
Validation Text property, 567
text criteria, domain aggregate functions, 463
text files
delimited, importing, 185–188
fixed-width, importing, 188–192
linking to, 222–225
Text Formatting group, 536
Datasheet Ribbon, 135
themes, reports, 612–616
Themes group, 612–614
colors, 614–616
TIF images, 578
Timer event, 849
title bar text, Caption property, 546–547
titles, reports, centering, 687
Toggle Button Ribbon control, 570, 959
toolbars, Quick Access, 25–27, 138, 964–966
Tools group, Primary Key, 72
Total row, 165–166
total row, adding, 330–331
Totals, activating, 312–313
Totals button, 165–166
transaction tables, 32
TRANSFORM statement (SQL), crosstabs, 437
transformation
case, changing, 367–368
fields
concatenation, 364–367
filling in blank, 363–364
strings
parsing, character markers and,
spaces, removing, 368–369
text
find and replace, 370
inserting in strings, 370–374
Triple State property, 570
Trust Center, 712–713
two-pass processing of reports, 699

U
unbound combo boxes, 937–939
bookmarks, 941–944
FindRecord method, 939–941
unbound controls, 506
calculated, 571
Undo button, 148
Quick Access toolbar, 138
Undo command, Quick Access toolbar, 25
Undo event, 850, 852
Unhide Columns dialog box, 159
Unicode Compression property, 54–55
UNION operator, 438–440
Unload event, 849
update anomalies, 95, 100
update queries, 332–336
expressions, 334–335
subqueries, 456
Updated event, 852
Use Control Wizards, 506
Use Default Paper Size property, 556
user interface, 563
validation, data types, automatic, 138–140
Validation Rule property, 54, 63–65
referential integrity, 126–127
Validation Text property, 54, 63–65
values, 6
   logical, 42
Var aggregate function, 317
variables, 801
   declarations, 802–806
      Dim keyword, 807
      Private keyword, 808–809
      Public keyword, 807–808
explicit, 811–812
implicit, 811–812
lifetime, 817–818
naming, 803–804
   conventions, 813–815
scope, 816–817, 819
temporary
   macros, 723–727
   VBA and, 727–728
Variant data type (VBA), 810
VBA (Visual Basic for Applications), 4, 9, 759–760.
   See also macros
ADO (ActiveX Data Objects) and, 763
arrays
   dynamic, 825–826
   fixed, 822–824
   functions, 826–829
branching, 777–783
callbacks, 967–969
code organization
   comments, 867
   compile frequency, 867
   constants, 866
   modules, 866–867
   naming conventions, 866
   procedure length, 866
   repetition, 867
   variable scope, 866
code window
   compiling procedures, 776
   IntelliSense, 773–776
   line continuation, 771–772
   multi-statement lines, 772–773
   saving modules, 777
   whitespace, 770–771
constants, 819
   declaring, 820
   hard-code values, 821–822
   naming convention, 821
converting macros, 737–739
DAO (Data Access Objects) and, 763
data types
   Access field types and, 810–811
   Boolean, 809
   Byte, 809
   Currency, 809
   Date, 809
   Decimal, 809
   Double, 810
   Integer, 810
   Long, 810
   Object, 810
   Single, 810
   String, 810
   Variant, 810
debugging, testing applications, 867–873
For Each statement, 790–791
events, triggering, 844–845
extensibility, 763
functions, 762, 769–770, 829
   calling, 829–830, 836–838
   creating, 835–840
   parameters, 836
   sales tax calculation, 838–840
If keyword
   Boolean values, 780–781
   If...Else...End If construct, 779
   If...ElseIf...End If construct, 779
   If...End If construct, 778
   If...Then construct, 778
   nested If statements, 780
keywords, 761
looping
   Do...Loop statement, 783–784
   For...Next statement, 784–786
macro comparison, 737–739
macros, 705–706
methods, 788–789
modules, 762
   class, 764, 766
   saving, 777
   sections, 767
   standard, 764, 765–766
Now() function, 762
Index

VBA (Visual Basic for Applications) (continued)
objects, collections, 786–788
procedures, 762, 763–764
calling, 830–831
compiling, 776
creating, 830
declaring, 832
functions, 762
named arguments, 840–842
statements, 832
subroutines, 827–829
creating, 831–834
invoking, 829–830
running, 829–830
table updates, 923–924
calculated controls, 926–932
deleting records, 933–936
fields, 924–926
new records, 932
variables, 762, 801
declarations, 802–809
explicit, 811–812
implicit, 811–812
lifetime, 817–818
naming, 803–804, 813–815
scope, 816–817, 819
temporary, 727–728
VBE (Visual Basic Editor)
Immediate window, 792–793
Object Browser, 794, 903–904
Options dialog box, 795–797
Project Explorer, 793
Toggle Folders, 794
View Code, 794
View Object, 794
Project Properties dialog box, 797
conditional compilation, 799
Project Description, 799
Project Name, 798
project protection, 800
video data, 42
views
all relationships, 125
Datasheet, 130, 490
Design, 34–35, 490
Form, 490, 532
forms, 489–490
Datasheet, 490
Design, 490
Form, 490
Layout, 490
Layout, 490
Office Backstage, 25
Views group
Datasheet Ribbon, 134
Datasheet view, 534
Design view, 534
Form view, 534
Layout view, 534
Visible property, 557, 677
Visual Basic Editor, 711
W
Watches window, debugging and, 889–890
conditional watches, 891–892
Web Browser control, Control Source property, 570
Weekday function, 397–399
welcome screen, 17–18
Blank Database option, 18–20
Open Other Files hyperlink, 17
Recent section, 17
WHERE aggregate function, 318–320
WHERE clause (SQL), SELECT statement, 428
Width property, 551
wildcard characters
[!], 430
* (asterisk), 430
# (pound sign), 430
? (question mark), 430
[ ] (square brackets), 430
Find and Replace dialog box, 144
Like operator, 276–277, 294, 430–431
parameter queries, 410
selection criteria, 291–294
Window group
Datasheet Ribbon
Size to Fit Form button, 134
Switch Windows button, 134
Size to Fit Form control, 535
Switch Windows control, 536
windows
Datasheet, 131–135
tabbed, 23
With keyword, 953
wizards
Find Duplicates Query Wizard, 357–358
Form Wizard, 491, 492–495
Import Spreadsheet, 181
Import Text, 186–187
Input Mask, 62–63
Link Spreadsheet, 220
Microsoft Word Mail Merge, 206
Report Wizard, 599, 605–616
Subform, 591–592
Use Control Wizards, 506
WMF images, 578
Word
exporting to, 205–206
Word Merge, 205–206
workday calculation, 398–399
Workspace object (DAO), 905–906
X
XML (eXtensible Markup Language)
documents
exporting, 192–197
importing, 192–197
saving macros as, 756–757
Ribbon, 977–979
XPS files, 618–619
publishing to, 206–208
Y
Year function, 397–399
Yes/No data type, 42, 47
Z
Zoom dialog box, 540
Zoom window, field data events, 142