

Index

SYMBOLS AND NUMERICS

* (asterisk)

- password, replacing with asterisk display in view, 646
- text, replacing trimmed with, 145, 191
- wildcard character, 60, 69, 103, 532

@ (at sign)

- procedure argument prefix, 298
- UDF parameter prefix, 479
- variable prefix, 298

\ (backslash)

- escape character, 114, 532
- , function character set prefix, 114

|| (bars) concatenation operator, 68

[] (brackets, square)

- PostgreSQL array delimiters, 532
- validation string delimiters, 192
- wildcard text delimiters, 253

^ (caret)

- wildcard character, 253
- XOR operator, 584

: (colon) array slice indicator, 532

, (comma)

- list element separator, 532
- string set, comma-delimited, 341, 342, 346

\$ (dollar sign) function positional argument indicator, 532

(number sign)

- temporary table prefix, 298
- UDF name prefix, 479

() (parentheses) expression group delimiters, 532

% (percent sign)

- modulo operator, 71, 78
- wildcard character, 253

. (period) UDT attribute indicator, 532

+ (plus sign) concatenation operator, 68

? (question mark) Java parameter placemaker, 612

"" (quotation marks, double) string delimiters, 192, 384

' ' (quotation marks, single)

- escape delimiters, 532
- string delimiters, 192, 384

; (semicolon) command suffix, 532

_ (underscore)

- UDF name prefix, 479
- wildcard character, 253

3GL (third-generation language)

- ESQL, using in, 577–578
- 4GL compared, 19
- procedure, 20–21

4GL (fourth-generation language), 19–20, 22

0 (zero) division error, 435–437, 463–464, 502, 518

A

ABS function

- ANSI, 70, 72–73
- IBM DB2, 46
- Microsoft SQL Server, 46
- MySQL, 46, 320, 322–323
- Oracle, 46, 123–124
- PostgreSQL, 46, 388, 389
- standard identifier, 42
- Sybase, 46, 276, 277–278

abstract data type (ADT), 515

ACOS function

- ANSI, 70, 73
- MySQL, 320, 323, 326
- PostgreSQL, 388, 390
- Sybase, 276, 278

ActiveX error, 471

Adaptive Server Enterprise. See ASE

ADD_MONTHS function (Oracle), 114, 115–116

ADT (abstract data type), 515

AGE function (PostgreSQL), 399–400

aggregate function, 33–34, 427, 430, 585–586

ALL_MVIEW system tables, 636

ALL_PROCEDURES view, 444

ALL_SOURCE view, 444

ALTER FUNCTION statement

ALTER FUNCTION **statement**

- ANSI, 419
- IBM DB2, 459
- Microsoft SQL Server, 495
- MySQL, 525
- Oracle, 432
- Sybase, 516–517

ALTER SESSION **statement, 447**

ALTER SYSTEM **statement, 447**

ALTER TABLE **statement, 6**

AL16UTF16 character set, 114

analytic function, 29, 36, 97

analytical database model, 629

AND

- bitwise, 324
- statement, 138

ANSI (American National Standards Institute). See also specific function and statement

- data type, 5, 695
- IBM DB2 compliance, 16, 46–47
- INCITS, 15
- levels of compliance, 716
- Microsoft SQL Server compliance, 46–47
- MySQL compliance, 16, 46–47
- Oracle compliance, 3, 46–47
- PostgreSQL compliance, 16, 46–47
- procedural extension, 51–57
- query syntax, 60
- SQLJ standard, 54
- Sybase compliance, 16, 46–47
- UDB compliance, 16

API (Application Programming Interface)

- JDBC, 603–604
- Oracle, 604

application

- data heavy, 605
- database connection, establishing from, 602
- function, calling from, 601, 607
- login application
 - ASP.NET, creating using, 613–615
 - Java, creating using, 611–613
 - VB.Net, creating using, 608–611
- multitier, 603, 605
- permission, acquiring from, 602
- process model, 604–605, 606
- session, returning application running current, 219
- transaction heavy, 605

Application Programming Interface. See API

arccosine, returning, 73, 323, 390

archiving older data, optimizing performance via, 548

arcsine, returning, 73–74, 323, 390

arctangent, returning, 74, 323–324, 390–391

AREA function (PostgreSQL), 404–405

array

- defined, 713
- UDF array static value support, declaring, 418

The Art of Computer Programming, Volume 3: Sorting and Searching (Knuth), 104

ASCII character set

- character corresponding to code, returning, 66, 99–100, 339, 379
- code of character, returning, 66–67, 187, 338, 377–378
- US7ASCII, 109

ASCII function

- ANSI, 66–67
- Microsoft SQL Server, 187
- MySQL, 334, 338
- PostgreSQL, 375, 377–378

ASE (Adaptive Server Enterprise). See also specific Sybase function

- background, historical, 2, 3
- boot time/date, returning, 301
- busy time, returning, 303, 305
- character set information, returning, 301–302, 306, 307, 313
- client information, returning, 301–302
- connections, returning maximum number of simultaneous, 306–307
- error
 - log, 303–304
 - number, returning, 303, 310–311
- IDENTITY column value, returning, 304
- idle time, returning, 305
- language information, returning, 305–306
- login attempts, returning number of, 302–303
- OmniConnect feature, 510
- SQLJ licensing, 509
- version, returning, 313–314

ASIN function

- ANSI, 70, 73–74
- MySQL, 320, 323
- PostgreSQL, 388, 390
- Sybase, 276, 278

ASP.NET, creating login application using, 613–615

asterisk (*)

- password, replacing with asterisk display in view, 646
- text, replacing trimmed with, 145, 191
- wildcard character, 60, 69, 103, 532

at sign (@)

- procedure argument prefix, 298
- UDF parameter prefix, 479
- variable prefix, 298

ATAN function

ANSI, 70, 74
 MySQL, 320, 323
 PostgreSQL, 388, 390–391
 Sybase, 276, 278–279

ATAN2 function

ANSI, 70, 74
 MySQL, 320, 323–324
 PostgreSQL, 388, 391

ATN2 function (Sybase), 276, 279**average, returning**

ANSI, 62–63
 MySQL, 318
 optimizing, 632
 Oracle, 91–92
 PostgreSQL, 372
 Sybase, 273
 view, using, 620–621

AVG function

ANSI, 61, 62–63
 IBM DB2, 46
 Microsoft SQL Server, 46
 MySQL, 46, 317, 318
 Oracle, 46, 90, 91–92
 PostgreSQL, 46, 371, 372
 SELECT clause, 632
 standard identifier, 41
 Sybase, 46, 273

B**backslash (\)**

escape character, 114, 532
 UNISTR function character set prefix, 114

bars (||) concatenation operator, 68**BEGIN TRAN statement, 312****BEGIN TRANSACTION statement, 503****BEGIN . . . END statement, 522****BENCHMARK function (MySQL), 365, 366****BI (Business Intelligence), 713****big-endian data format, 270****BIN function (MySQL), 334, 339****binary value, converting to/from string, 339, 380****bit status, determining, 124****BIT_AND function (MySQL), 320, 324****BITAND function (Oracle), 123, 124****BIT_COUNT function (MySQL), 320, 324–325****BIT_LENGTH function**

ANSI, 41, 46, 68, 135
 PostgreSQL, 376, 378

BIT_OR function (MySQL), 320, 325**BLOB data type, 713****Boolean data type, 713****@@BOOTTIME function (Sybase), 299, 301****box**

height, returning, 406
 intersection of two boxes, returning, 405
 width, returning, 408

BOX_INTERSECT function (PostgreSQL), 404, 405**brackets, square ([])**

PostgreSQL array delimiters, 532
 validation string delimiters, 192
 wildcard text delimiters, 253

branch point, 13**BTRIM function (PostgreSQL), 375, 378****built-in function**

described, 19
 dropping, 461
 executing, 17
 IBM DB2, 36–37
 Microsoft SQL Server, 37–38
 MySQL, 39
 Oracle, 35–36
 PostgreSQL, 39–40
 SQL Server, 37–38
 Sybase, 37–38, 245
 UDF, overriding with, 458–459
 UDF, performance compared, 633
 UDF, system, 492–493
 UDF, using in, 481

Business Intelligence (BI), 713**C****C data type, 579****CALL statement, 52****calling function**

application, from, 601, 607
 UDF, 445–447, 483, 523, 543

caret (^)

wildcard character, 253
 XOR operator, 584

CASE

function (Microsoft SQL Server), 216, 219–220
 statement, 52, 129

CAST function

IBM DB2, 46
 Microsoft SQL Server, 46, 217, 220–224
 Oracle, 46, 106, 107–108
 PostgreSQL, 46
 standard identifier, 42
 Sybase, 46

CBRT function (PostgreSQL), 388, 391

CEIL function

CEIL function

ANSI, 70, 74–75
MySQL, 320, 325
Oracle, 123, 124
PostgreSQL, 388, 391–392

CEILING function

ANSI, 70, 74–75
IBM DB2, 47, 70
Microsoft SQL Server, 47, 70
MySQL, 47, 320, 325
Oracle, 47
standard identifier, 42
Sybase, 47, 276, 279–280

CENTER function (PostgreSQL), 404, 405

CHAR function

ANSI, 66
Microsoft SQL Server, 187–188
MySQL, 334, 339

character function, 35, 97–99

character set. *See also text; specific character set*

ASE character set information, returning, 301–302, 306, 307, 313
client character set information, returning, 301–302
data type
 converting between sets, 108–109, 113–114, 220, 266–270, 379
 Unicode representation, returning, 108
national, 99–100, 107, 113–114
server character set information, returning, 301–302, 306, 307, 313

CHARACTER_LENGTH function

IBM DB2, 46
Microsoft SQL Server, 46
MySQL, 335, 344–345
Oracle, 46
PostgreSQL, 46
standard identifier, 41
Sybase, 46

CHARINDEX function

Microsoft SQL Server, 185, 188
Sybase, 248, 249–250

CHAR_LENGTH function

ANSI, 68
MySQL, 335, 344–345
PostgreSQL, 376, 379
Sybase, 190, 248, 250

CHR function

ANSI, 66, 67
Oracle, 97, 99–100
PostgreSQL, 376, 379

CI.exe compiler, 577

classification, function, 27

clause, 7

@@CLIENT_CSID function (Sybase), 299, 301–302

@@CLIENT_CSNAME function (Sybase), 299, 302

CLOB data type, 714

CLOSE statement, 585

COALESCE function

ANSI, 85
IBM DB2, 177, 178
Microsoft SQL Server, 217, 224–225
MySQL, 365, 366
Oracle, 128–129, 133
PostgreSQL, 409–410

COBOL data type, 579

CODASYL (Committee on Data Systems and Languages), 15, 714

code block, 714

code generation optimization (Oracle), 714

COLLATIONPROPERTY function (Microsoft SQL Server), 218, 233

COL_LENGTH function

Microsoft SQL Server, 203, 204–205
Sybase, 288, 289–290

COL_NAME function (Sybase), 288, 290

colon (:) array slice indicator, 532

column function, 35, 37, 621

comma (,)

list element separator, 532
string set, comma-delimited, 341, 342, 346

COMMIT statement, 447, 628

COMMIT TRANSACTION statement, 503

Committee on Data Systems and Languages (CODASYL), 15, 714

COMPARE function (Sybase), 248, 250–252

compilation. *See also specific compiler*

back end, 713
ESQL, 577, 578
function, embedded, 577, 578
in-line, 56
make file, 441–442
module, compiled, 714
3GL, 20–21
UDF
 interpreted mode, 432, 441, 443
 native, 422, 432, 441, 443
 Oracle, 421–422, 431–432, 440–443
 smart, 422

COMPOSE function (Oracle), 106, 108

COMPRESS function (MySQL), 334, 339–340

- CONCAT function**
 ANSI, 66, 67–68
 IBM DB2, 140, 142, 472–473
 MySQL, 334, 340
 overloading, 472–473
- concatenation**
 data warehouse data, 574–575
 string
 ANSI, 67–68
 IBM DB2, 142
 MySQL, 340–341
 Sybase, 266
- CONCAT_WS function (MySQL), 334, 340–341**
- configuration function, 38**
- CONNECT statement, 4, 21**
- connection. See database, connection; server, connection**
- @@CONNECTION function (Microsoft SQL Server), 207–208**
- CONNECTION_ID function (MySQL), 365, 366**
- @@CONNECTIONS function**
 Microsoft SQL Server, 481
 Sybase, 299, 302–303
- control structure, 714. See also 3GL**
- CONV function (MySQL), 320, 325–326**
- conversion function, 36, 38, 40, 106–107**
- CONVERT function**
 Microsoft SQL Server, 217, 220
 Oracle, 106, 108–109
 PostgreSQL, 179, 376, 379
 Sybase, 266–270
- Coordinated Universal Time (UTC), 117, 176, 202, 481**
- CORR function**
 Oracle, 90, 92–93
 standard identifier, 43
- COS function**
 ANSI, 70, 75
 MySQL, 320
 PostgreSQL, 388, 392
 Sybase, 276, 280
- COSH function (ANSI), 70, 75**
- cosine, returning, 75, 280, 326, 392**
- COT function**
 ANSI, 70, 75–76
 MySQL, 320, 326
 PostgreSQL, 388, 392
 Sybase, 276, 280
- cotangent, returning, 75–76, 280, 326, 392**
- COUNT function**
 ANSI, 61, 63–64
 IBM DB2, 46
 Microsoft SQL Server, 46
 MySQL, 317, 318
 Oracle, 46, 90, 93–94
 PostgreSQL, 46, 371, 373
 standard identifier, 41
 Sybase, 46, 273, 274
 UDF, overriding with, 458–459
- COVAR_POP function, 43**
- COVAR_SAMP function, 43**
- @@CPU_BUSY function**
 Microsoft SQL Server, 234, 235, 481
 Sybase, 299, 303
- CREATE DATABASE statement, 5**
- CREATE FUNCTION statement**
 AGGREGATE USING clause, 427
 AUTHID clause, 426
 BEGIN ATOMIC clause, 454, 476
 CALL ON NULL INPUT clause, 418
 CALLED ON NULL INPUT clause, 453
 CLUSTER BY clause, 427
 COMMENT clause, 522
 CONTAINS SQL clause, 418, 453
 DETERMINISTIC clause, 418, 426, 522
 EXTERNAL ACTION clause, 453
 FEDERATED clause, 453
 IN clause, 424, 452, 522
 IN OUT clause, 424, 452, 522
 INHERITS SPECIAL REGISTERS clause, 453
 LANGUAGE clause
 ANSI, 418
 IBM DB2, 452, 468, 469
 MySQL, 522, 528
 MAPPING clause, 458
 MODIFIES SQL DATA clause, 418
 NO EXTERNAL ACTION clause, 453
 NO SQL clause, 418
 NOCOPY clause, 425
 NON FEDERATED clause, 453
 NONDETERMINISTIC clause, 418, 522
 ORDER BY clause, 427
 OUT clause, 424, 452, 522
 PARALLEL ENABLE clause, 427
 PARAMETER STYLE clause, 418
 PIPELINED clause, 427
 PRAGMA AUTONOMOUS_TRANSACTION clause, 427
 PRAGMA EXCEPTION_INIT clause, 435
 PRAGMA RESTRICT_REFERENCES clause, 446, 447
 PRAGMA SERIALLY_REUSABLE clause, 438
 PREDICATES clause, 453
 READS SQL clause, 453
 READS SQL DATA clause, 418, 469, 476

CREATE FUNCTION statement (continued)

CREATE FUNCTION **statement (continued)**

REPLACE clause, 424
RETURN NULL ON NULL INPUT clause, 418, 514
RETURNS clause, 457, 524, 525
SELECTIVITY clause, 453
SOURCE clause, 457
SPECIFIC clause, 418, 452, 460, 471
SQL SECURITY clause, 522
SQLJ function syntax, 510–513
STATIC DISPATCH clause, 418, 453
WITH clause, 480, 487, 488

CREATE INDEX **statement, 6–7, 29**

CREATE LIBRARY **statement, 427**

CREATE OR REPLACE FUNCTION **statement, 15**

CREATE TABLE **statement, 5–6**

CRTSSQLCI (Create Structure Query Language ILE C) compiler, 449

cube root, returning, 391

CUME_DIST **function, 34, 45**

CURDATE **function (MySQL), 354, 356**

CURRENT_TIME **function (PostgreSQL), 117**

CURRENT DATE **function**
IBM DB2, 169, 170–171
PostgreSQL, 121

CURRENT DEFAULT TRANSFORM GROUP **function (IBM DB2), 169, 171**

CURRENT DEGREE **function (IBM DB2), 169, 171**

CURRENT EXPLAIN MODE **function (IBM DB2), 169, 171–172**

CURRENT EXPLAIN SNAPSHOT **function (IBM DB2), 169, 172**

CURRENT ISOLATION **function (IBM DB2), 172–173**

CURRENT NODE **function (IBM DB2), 170, 173**

CURRENT PATH **function (IBM DB2), 170**

CURRENT QUERY OPTIMIZATION **function (IBM DB2), 170, 174**

CURRENT REFRESH AGE **function (IBM DB2), 170, 174**

CURRENT SCHEMA **function (IBM DB2), 170, 174**

CURRENT SERVER **function (IBM DB2), 170, 175**

CURRENT TIME **function (IBM DB2), 170, 175**

CURRENT TIMESTAMP **function (IBM DB2), 175–176**

CURRENT TIMEZONE **function (IBM DB2), 176**

CURRENT_DATABASE **function (PostgreSQL), 409, 410**

CURRENT_DATE **function**
IBM DB2, 46
Microsoft SQL Server, 46
MySQL, 117
Oracle, 46, 117, 120, 121
PostgreSQL, 46, 399, 400
standard identifier, 42
Sybase, 46

CURRENT_DEFAULT_TRANSFORM_GROUP **function (IBM DB2), 660**

CURRENT_SCHEMA **function (PostgreSQL), 409, 410–411**

CURRENT_SCHEMAS **function (PostgreSQL), 409**

CURRENT_TIME **function**
IBM DB2, 46
Microsoft SQL Server, 46
Oracle, 46
PostgreSQL, 46, 399, 400
standard identifier, 42
Sybase, 46

CURRENT_TIMESTAMP **function**
IBM DB2, 46, 170
Microsoft SQL Server, 46, 217, 225, 243
Oracle, 46
PostgreSQL, 46
standard identifier, 42
Sybase, 46, 295

CURRENT_TIMEZONE **function (IBM DB2), 170**

CURRENT_USER **function**
Microsoft SQL Server, 217, 225–226
PostgreSQL, 409, 411

cursor
defined, 714
function, 38, 585–586, 606
migrating, 557
status, returning, 309–310

CURTIME **function (MySQL), 354, 356–357**

D

Data Definition Language (DDL), 15

Data Dictionary, 443–445

data heavy application, 605

Data Manipulation Language (DML), 445, 533

Data Query Language (DQL), 533

data type

ADT, 515
ANSI, 5, 695
BLOB, 713
Boolean, 713
C, 579
CLOB, 714
COBOL, 579
column type, assigning, 6
composite, 534–536
converting
binary value to/from string, 339, 380
character data, to, 108, 110–113, 165–166, 194–195
character sets, between, 108–109, 113–114, 220, 266–270, 379

- compatible types, between, 107–108, 220–224, 264–270
- decimal representation, to, 163–164
- disassembling result, 110
- explicit, 107
- floating-point representation, to, 164–165
- function, conversion, 36, 38, 40, 106–107
- hexadecimal representation, to, 164, 240, 270–271, 342
- IBM DB2, 162–166
- implicit, 107, 138, 142
- integer representation, to, 165, 271
- Microsoft SQL Server, 220–224
- Oracle, 106–114
- Sybase, 257–258, 263, 264–271
- Unicode representation, returning, 108
- custom, 714
- DBCLOB, 715
- ESQL, 579
- expression data type code, returning, 128, 130–131
- IBM DB2
 - converting, 162–166
 - listing of IBM DB2 types, 696
- Java, 513, 514–516
- Microsoft SQL Server
 - converting, 220–224
 - listing of SQL Server types, 697
- migrating, 557, 560, 575
- MySQL, 522, 697–698
- Oracle
 - converting, 106–114
 - listing of Oracle types, 696
- PostgreSQL
 - listing of PostgreSQL types, 698
 - UDT, 534–536
- SQLJ, 513, 514–516
- Sybase
 - converting, 257–258, 263, 264–271
 - listing of SQL Sybase types, 697
- UDF
 - argument, 425, 510
 - UDT, using in, 476, 479, 534–536
- UDT
 - identifier, returning, 182
 - name, returning, 182
 - PostgreSQL, 534–536
 - UDF, using in, 476, 479, 534–536
- data warehouse**
 - accuracy, 569
 - concatenating data, 574–575
 - consistency, 566–567, 569
 - disassembling/reassembling data, 575–576
 - inserting data, 566–567
 - naming convention, 566–567
 - querying, 567–569
 - schema, 566
 - scrubbing data, 569–570
 - standardizing data in multiple database environment, 570–572
 - summarizing data, 572–574
 - table
 - design, 566–567, 571
 - filtering column input, 569
 - join, 568
- database. See also schema; table**
 - analytical processing database architecture, 629, 713
 - blocking, 630–631
 - connection
 - application, establishing from, 602
 - changing to another database, 4
 - closing, 4, 602, 607, 612
 - node connected to, returning, 173
 - number of open connections, returning, 208
 - opening, 4, 602, 607, 610
 - partition connected to, returning, 173
 - pooling, 602, 607, 631
 - creating, 5–7
 - driver, 603–604, 711
 - ID
 - returning database ID, 205, 291–292
 - returning ID of object in database, 292–293
 - index
 - covering, 7
 - creating, 6–7
 - dynamic SQL, 172
 - function-based, 29, 30, 31
 - migrating, 557
 - performance, optimizing using, 373
 - instance timestamp, returning, 225
 - locking, 630–631
 - migrating
 - cursor, 557
 - data type, 557, 560, 575
 - field, 560–561
 - generating SQL, implementing via, 591–594
 - index, 557
 - integrity of new database, verifying, 559, 563–564
 - Microsoft SQL Server, 560–563, 575, 592–593
 - permission, 557
 - planning, 557–558
 - platform, to another, 556, 591–594
 - schema, 556–557
 - UDF, using, 560–564
 - user account, 557
 - version, to another, 556

database (continued)

database (continued)

name

returning name of database, 205–206, 292, 367, 410

returning name of object in database, 293

standardizing data in multiple database environment, 570–572

time zone, returning, 116–117

transactional, 628

user information, returning, 213, 214–216, 296–297, 411

DATABASE function (MySQL), 365, 367

DATALength function

Microsoft SQL Server, 135, 194, 217, 226

Sybase, 135, 288, 290, 291

date

abbreviation recognition by Sybase, 260–261

current, returning

IBM DB2, 170–171

Microsoft SQL Server, 202, 481

MySQL, 356, 362

Oracle, 120–121

PostgreSQL, 400, 403

server time zone date, 42

session time zone date, 42

Sybase, 264

system date, 115, 120–121, 170–171, 202, 362

day

adding to/subtracting from input argument, 261, 357

month, returning day of, 151, 360

name, returning, 151–152, 359

rounding to nearest, 115, 119–120

week, returning day of, 152

week, specifying first day of, 199

year, returning day of, 153, 360

year zero, returning number of days from, 154–155, 360, 364–365

difference between two dates, calculating, 115, 118, 199, 262, 363

ESQL date function, 588–589

field, returning date value from, 117–118, 401

formatting

IBM DB2, 154

ISO format, 263

Microsoft SQL Server, 198, 200–201

MySQL, 356, 358–359

Oracle, 119–122

Sybase, 267

month

adding to/subtracting from input argument, 115–116, 198, 261, 357, 362–363

day of, returning, 151, 360

difference between two dates, returning in months, 363

name, returning, 157, 362

returning month part of date value, 156–157, 200, 201–203, 362

quarter

adding to/subtracting from input argument, 261, 357

returning quarter part of date value, 200

query, restricting by, 17, 18

server

boot date, returning, 301

system date, returning, 115, 120–121, 170–171, 202, 362

time zone, returning date in current, 42

timestamp, returning from date/time value, 42, 158

truncating date value, 115, 121–122, 262

week

adding to/subtracting from input argument, 357

day of, returning, 152

day of, specifying first, 199

returning week part of date value, 161, 200

year, returning week of, 161, 263

year

adding to/subtracting from input argument, 261, 357–358

day of, returning, 153, 360

days from year zero, returning number of, 154–155, 360, 364–365

returning year part of date value, 161–162, 200, 203

week of, returning, 161, 263

DATE function (IBM DB2), 148, 150–151

DATEADD function

Microsoft SQL Server, 197, 198–199

Sybase, 260, 261

DATE_ADD function (MySQL), 354, 357–358

DATEDIFF function

Microsoft SQL Server, 118, 159, 197, 199

Sybase, 118, 159, 260, 262

DATE_DIFF function (MySQL), 118

@@DATEFIRST function (Microsoft SQL Server), 197, 199

DATE_FORMAT function (MySQL), 354, 358–359

DATENAME function

Microsoft SQL Server, 197, 200

Sybase, 260, 262–263

DATEPART function

Microsoft SQL Server, 161, 197, 200–201

Sybase, 161, 260, 263

DATE_PART function

Microsoft SQL Server, 152

PostgreSQL, 151, 399, 400–401

Sybase, 152

DATE_SUB function (MySQL), 354, 357–358

DATE_TRUNC function (PostgreSQL), 399, 401

- DAY **function**
 - IBM DB2, 148, 151
 - Microsoft SQL Server, 197, 201–202
- DAYNAME **function**
 - IBM DB2, 148, 151–152
 - MySQL, 354, 359
- DAYOFMONTH **function (MySQL), 202, 354, 360**
- DAYOFWEEK **function**
 - IBM DB2, 148
 - MySQL, 152
- DAYOFWEEK_ISO **function (IBM DB2), 148, 152**
- DAYOFYEAR **function**
 - IBM DB2, 148, 153
 - MySQL, 354, 360
- DAYS **function (IBM DB2), 149, 153**
- DBA_MVIEW **system tables, 637**
- DBA_PROCEDURES **view, 444**
- DBA_SOURCE **view, 444**
- DBA_VIEWS **system table, 637**
- DBCLOB **data type, 715**
- DB_ID **function**
 - Microsoft SQL Server, 203, 205
 - Sybase, 288, 291–292
- DBMS_DEBUG **package (Oracle), 434**
- DBMS_OUTPUT **package (Oracle), 433–434, 440**
- DBMSSTDIX.SQL **file, 423**
- DB_NAME **function**
 - Microsoft SQL Server, 204, 205–206
 - Sybase, 288, 292
- DBTIMEZONE **function (Oracle), 114, 116–117**
- DB2 database platform. See specific function and topic**
- DB2 LUW (DB2 for Linux, UNIX, and Windows), 463**
- DB2 SQL Procedural Language for Linux, UNIX and Windows (Yip et al.), 56**
- DDL (Data Definition Language), 15**
- Debug Procedure dialog box (Query Analyzer), 498–499**
- DEC **function (IBM DB2), 162, 163–164**
- DECIMAL
 - data type, 5, 163–164
 - function (IBM DB2), 162, 163–164
- declarative language, 49–51**
- DECLARE **statement, 585**
- DECODE **function**
 - Oracle, 128, 129–130
 - PostgreSQL, 167, 376, 380
- DECOMPOSE **function (Oracle), 106, 110**
- DECRYPT_BIN **function (IBM DB2), 167**
- DECRYPT_CHAR **function (IBM DB2), 167, 168**
- DEGREES **function**
 - ANSI, 70, 76
 - MySQL, 320, 326–327
 - PostgreSQL, 388, 393
 - Sybase, 276, 280–281
- delete **ESQL statement, 578**
- DELETE **SQL statement, 10–11, 507**
- DENSE_RANK **function, 34, 45**
- DENY **statement, 478**
- deterministic/non-deterministic function**
 - ANSI, 418
 - IBM DB2, 29–30, 452
 - introduced, 27–28
 - Microsoft SQL Server, 30–31, 481, 507
 - MySQL, 522
 - Oracle, 29, 426
 - SQLJ, 512
 - Sybase, 31, 510
- DIAMETER **function (PostgreSQL), 404, 405–406**
- DIANA (Descriptive Intermediate Attributed Notation for Ada), 421**
- DICT_COLUMNS **view, 636, 637**
- dictionary**
 - Data Dictionary, 443–445
 - string comparison, used in, 251
- Dictionary view, 443–445, 636**
- DIFFERENCE **function**
 - Microsoft SQL Server, 186, 188–189
 - Sybase, 248, 252
- DIGITS **function (IBM DB2), 177**
- direct SQL implementation, 715**
- dirty read, 628**
- DISCONNECT **statement, 4**
- DIVIDEBYZERO **function, 518**
- DML (Data Manipulation Language), 445, 533**
- dollar sign (\$) function positional argument indicator, 532**
- DOUBLE **function (IBM DB2), 162, 164–165**
- DOUBLE PRECISION **function (IBM DB2), 162, 164–165**
- DQL (Data Query Language), 533**
- DROP FUNCTION **statement**
 - ANSI, 419
 - Microsoft SQL Server, 496–497
 - MySQL, 526
 - Oracle, 432
 - PostgreSQL, 537–538
 - Sybase, 417
- DROP **statement, 459–461**
- DUMP **function (Oracle), 128, 130–131**
- dynamic SQL**
 - Explain information, enabling/disabling, 172
 - index, 172
 - intra-partition parallelism degree, returning, 171
 - overhead, 606
 - path of dynamic statement, resolving, 173
 - query, 172, 579–581, 606

dynamic SQL (continued)

- schema, returning current, 174
- transform group used, returning, 171
- UDF, executing from, 507

E

Edit ⇨ **Insert Template (Query Analyzer), 489**

Edit ⇨ **Replace Template Parameters (Query Analyzer), 489**

ELT function (MySQL), 334, 341

Embedded SQL. See ESQL

encapsulation, 24, 715

ENCODE function (PostgreSQL), 376, 380

ENCRYPT function

- IBM DB2, 167, 168
- Microsoft SQL Server, 239, 240

encryption

- decrypting encrypted data, 167, 168, 240
- ESQL, defining encryption key using, 584–585
- login application, Java-based, 611
- MD5 hash, 382
- password, 168, 169, 241–242
- string, 168, 240, 382
- UDF, 480, 488

E/R schema, 566

error. See also specific error

- ActiveX, 471
- ESQL, 581
- I/O errors, returning number of, 236–237, 310–311
- log, 303–304, 503, 612
- login application, Java-based, 612, 613
- message
 - custom, displaying, 464, 508
 - IBM DB2, 463, 464–471
- number, returning, 303, 310–311
- OLE, 471
- UDF error handling
 - IBM DB2, 463–464
 - Microsoft SQL Server, 502–503
 - MySQL, 526
 - Oracle, 434–437
 - PostgreSQL, 538
 - SQLJ, 517–518
 - Sybase, 517–518
- 0 (zero) division, 435–437, 463–464, 502, 518

@@ERROR function

- Microsoft SQL Server, 217, 226–227
- Sybase, 299, 303, 517, 518

@@ERRORLOG function (Sybase), 299, 303–304

ESQL (Embedded SQL)

- aggregate function, 585–586
- compiling, 577, 578

data type, 579

date function, 588–589

encryption key, defining using, 584–585

error handling, 581

host variable usage, 579

IBM DB2, 577

language support, 577, 578

math function, 586–587

Microsoft SQL Server, 577

MySQL, 577

Oracle, 577

PostgreSQL, 577

query, dynamic, 579–581

scalar function, 584–585

statement, 578–579

string function, 589–590

Sybase, 577

table

- single-row function, 582–583

- updating, 580–581

3GL, using in, 577, 578

time function, 588–589

UDF, embedded, 578

EXCEPTION error handler, 463

EXEC statement, 578

EXECUTE IMMEDIATE statement, 476

EXECUTE statement, 476, 580

execution speed of expression, timing, 366

EXP function

- ANSI, 70, 76–77

- IBM DB2, 47

- Microsoft SQL Server, 47

- MySQL, 47, 320, 327

- Oracle, 47

- PostgreSQL, 47, 388, 393

- standard identifier, 42

- Sybase, 47, 276, 281

Explain facility, 171–172

expression

- comparing expressions, 85–86, 128, 129–133

- data type code, returning, 128, 130–131

- execution speed, timing, 366

- list, returning first non-null value in

 - ANSI, 85

 - IBM DB2, 178

 - Microsoft SQL Server, 224–225

 - MySQL, 366

 - Oracle, 128–129

 - PostgreSQL, 409–410

 - Sybase, 85

- list, returning greatest value in, 128, 131–132

null, checking if
 ANSI, 85–86
 IBM DB2, 180
 Microsoft SQL Server, 229–230
 MySQL, 343–344, 347
 Oracle, 132–133
 PostgreSQL, 411
 regular expression, 106, 188, 250, 386
 size in bytes, returning, 130–131, 134–135, 226, 291
eXtensible Markup Language (XML), returning query result as, 184
extension, procedural, 38, 39, 50, 51–57
EXTRACT function
 Oracle, 114, 117–118, 203
 PostgreSQL, 399, 401
 Sybase, 203

F

F7DEC character set, 109
FETCH statement, 585
field
 migrating, 560–561
 returning date/time value from, 117–118, 401
 string index value, returning, 341–342
FIELD function (MySQL), 334, 341–342
file
 compilation make file, 441–442
 ID, returning, 206
 name, returning, 207
 query result, sending to, 316
 string, returning as, 367
FILE_ID function (Microsoft SQL Server), 204, 206
FILE_NAME function (Microsoft SQL Server), 204, 207
FIND_IN_SET function (MySQL), 335, 342
FIRST_VALUE function (Oracle), 28
FLOOR function
 ANSI, 70, 74–75
 IBM DB2, 47, 70
 Microsoft SQL Server, 47, 70
 MySQL, 47, 321, 327
 Oracle, 47, 123, 124–125
 PostgreSQL, 47, 388, 393
 standard identifier, 42
 Sybase, 47, 277, 281
fn_get_sql function, 239, 240–241, 492
fn_helpcollations function, 492
fn_listextendedproperty function, 492, 503
fn_serversharedrive function, 493
fn_trace_getinfo function, 493
fn_virtualfilestats function, 235, 238, 493
fn_virtualservernodes function, 493

FOR statement, 52
FORMAT function (MySQL), 321, 327
4GL (fourth-generation language), 19–20, 22
FROM_DAYS function (MySQL), 354, 360
FROM_TZ function, 119
FROM_UNIXTIME function (MySQL), 354, 361

G

GENERATE_UNIQUE function (IBM DB2), 28, 177
generating SQL
 database migration, implementing via, 591–594
 random value, populating column with using generated SQL, 594–598
 UDF, using, 592–593, 596–598
GETDATE function
 Microsoft SQL Server, 27–28, 197, 198, 202, 481
 Sybase, 117, 121, 260, 264
GETHINT function (IBM DB2), 167, 169
GETUTCDATE function
 Microsoft SQL Server, 117, 197, 202, 481
 Sybase, 117
GRANT statement, 477–478
GREATEST function
 MySQL, 321, 328
 Oracle, 128, 131–132
GROUPING function
 ANSI, 64
 Oracle, 90, 94
GV\$FIXED_VIEW_DEFINITION system table, 637

H

HAS_DBACCESS function (Microsoft SQL Server), 213
HEIGHT function (PostgreSQL), 404, 406
HEX function
 IBM DB2, 162, 164
 MySQL, 335, 342
hexadecimal representation of value, returning, 164, 240, 270–271, 342
HEXTOINT function (Sybase), 266, 271
hint, query, 88
HOST_ID function (Microsoft SQL Server), 217, 227
HOST_NAME function (Microsoft SQL Server), 217, 227–228
HOURL function
 IBM DB2, 149, 153–154
 MySQL, 355, 361
hyperbolic cosine, returning, 75
hyperbolic sine, returning, 72, 82
hyperbolic tangent, returning, 72, 83–84

IBM DB2 database platform. See *specific function and topic*

IDENT_CURRENT function, 234

identifier validity, checking, 297–298

@@IDENTITY function

Microsoft SQL Server, 217, 228

Sybase, 299, 304

IDENTITY function (Microsoft SQL Server), 217, 228–229

@@IDLE function

Microsoft SQL Server, 234, 235, 481

Sybase, 299, 305

IF statement, 51

IFNULL function, 133

image pointer, returning, 287–288

INCITS (International Committee for Information Technical Standards), 15

index, database. See *database, index*

INFORMATION_SCHEMA view

IBM DB2, 474

Microsoft SQL Server, 494, 504, 505–507

MySQL, 526

Oracle, 443

PostgreSQL, 533, 539, 542

Sybase, 518

INITCAP function

Oracle, 97, 100

PostgreSQL, 376, 380–381

input/output. See *I/O*

INSERT

function

IBM DB2, 140, 142–143

MySQL, 335, 342–343

statement, 9, 507, 591–594

INSTALL JAVA statement, 516

INSTR function (MySQL), 335, 343

INT function (IBM DB2), 162, 165

International Committee for Information Technical Standards (INCITS), 15

International Standards Organization. See *ISO*

INTERVAL function (MySQL), 321, 328

intra-partition parallelism, 171

INTTOHEX function (Sybase), 266, 270–271

I/O (input/output)

busy time, returning, 305

error total, returning, 236–237, 310–311

packet information, returning, 481

performance, optimizing, 631

read total, returning, 237, 311, 481

write total, returning, 237–238, 311, 481

@@IO_BUSY function

Microsoft SQL Server, 234, 236, 481

Sybase, 299, 305

IQ software, 3

ISCLOSED function (PostgreSQL), 404, 406

ISDATE function (Microsoft SQL Server), 218, 229

ISFINITE function (PostgreSQL), 399, 402

ISNULL function

Microsoft SQL Server, 133, 218, 229–230

MySQL, 335, 343–344

Sybase, 133

ISNUMERIC function (Microsoft SQL Server), 218, 230

ISO (International Standards Organization)

date format, 263

SQL standard, 2

SQLJ standard, 54

time format, 154, 160

isolation level, returning, 172–173

ISOPEN function (PostgreSQL), 404, 406–407

IS_SEC_SERVICE_ON function (Sybase), 271, 272

J

Java. See also *SQLJ*

data type, 513, 514–516

database connection, opening using, 607

login application, creating using, 611–613

query, Java-based, 607–608

stub, 718

Java Virtual Machine (JVM), 54

JDBC (Java Database Connectivity)

API, 603–604

data type mapping, 514–516

driver, 603–604

native implementation, 603

procedure, calling, 711–712

SQLJ requirement, 54

JOIN function (Microsoft SQL Server), 485

JULIAN_DAY function (IBM DB2), 149, 154–155

JVM (Java Virtual Machine), 54

K

keyword

ANSI keyword list, 669

IBM DB2 keyword list, 683–685

introduced, 7

Microsoft SQL Server keyword list, 685–688

MySQL keyword list, 689

Oracle keyword list, 680–682

PostgreSQL keyword list, 691–693

Sybase keyword list, 690–691

Knuth, Donald E. (*The Art of Computer Programming, Volume 3: Sorting and Searching*), 104

L**@@LANGID function**

Microsoft SQL Server, 207, 208

Sybase, 299, 305–306

language. See also specific language

ASE language information, returning, 305–306

declarative, 49–51

dictionary used in string comparison, 251

ESQL support, 577, 578

extension, 20

4GL, 19–20, 22

ID

current, returning, 208

description assigned to, returning, 306

procedural

ANSI procedural extension, 51–57

declarative language compared, 49–51

server language information, returning, 208–210,
305–306

3GL, 19, 20–21, 577, 578

UDF language

declaring, 418, 511

returning from System Catalog, 641

@@LANGUAGE function

Microsoft SQL Server, 207, 208–210

Sybase, 300, 306

Last In, First Out (LIFO), 13**lazy developer, 594****LCASE function**

IBM DB2, 190

MySQL, 335, 344

LDL (Logic Database Language), 430**LEAST function (MySQL), 321, 328–329****least-squares-fit linear equation, 44****LEAVE statement, 52****LEFT function**

IBM DB2, 140, 143

Microsoft SQL Server, 186, 189

MySQL, 335, 344

Sybase, 248, 255

LEN function

ANSI, 66, 68–69

Microsoft SQL Server, 186, 189–190

LENGTH function

ANSI, 66, 68–69

IBM DB2, 135, 140, 143–144

MySQL, 335, 344–345

PostgreSQL, 376, 381, 404, 407

LENGTHB function, 110, 134**LIFO (Last In, First Out), 13**

Linker.exe file, 577

little-endian data format, 270**LN function**

ANSI, 71, 77

IBM DB2, 47

Microsoft SQL Server, 47

MySQL, 47

Oracle, 47

PostgreSQL, 47, 388, 394

standard identifier, 42

Sybase, 47

load balancing, 311**LOAD_FILE function (MySQL), 365, 367****LOCALTIME function**

IBM DB2, 46

Microsoft SQL Server, 46

Oracle, 46

PostgreSQL, 46, 117, 399, 402

standard identifier, 42

Sybase, 46

LOCALTIMESTAMP function

IBM DB2, 46

Microsoft SQL Server, 46

Oracle, 46

PostgreSQL, 46, 399, 402

standard identifier, 42

Sybase, 46

LOCATE function

IBM DB2, 141, 144

MySQL, 336, 345

@@LOCK_TIMEOUT function (Microsoft SQL Server), 207, 210**LOG function**

ANSI, 71, 77

MySQL, 321, 329

PostgreSQL, 388, 394

Sybase, 277, 281–282

LOG10 function

ANSI, 71, 77

MySQL, 321, 329

Sybase, 277, 282

LOG2 function (ANSI), 71, 77**Logic Database Language (LDL), 430****login. See also server, connection**

ASP.NET, creating login application using, 613–615

Java, creating login application using, 611–613

name, returning, 214

number of logins attempted, returning, 208, 302–303, 481

SID of login name, returning, 214

VB.Net, creating login application using, 608–611

LOOP statement

LOOP **statement**, 52

LOWER **function**

ANSI, 66, 68
IBM DB2, 46
Microsoft SQL Server, 46, 190
MySQL, 335, 344
Oracle, 46
PostgreSQL, 46, 376, 381
standard identifier, 41
Sybase, 46

LPAD **function**

MySQL, 336, 346
Oracle, 98, 101–102
PostgreSQL, 376, 381–382

LTRIM **function**

IBM DB2, 141, 144–145
Microsoft SQL Server, 186, 190–191
MySQL, 336, 346
Oracle, 98, 102
PostgreSQL, 376, 382
Sybase, 248, 252–253

M

MAKE_SET **function (MySQL)**, 336, 346–347

math. See also number

absolute value, returning
ANSI, 72–73
MySQL, 322–323
Oracle, 123–124
PostgreSQL, 389
Sybase, 277–278
arccosine, returning, 73, 323, 390
arcsine, returning, 73–74, 323, 390
arctangent, returning, 74, 323–324, 390–391
area, returning, 404–405
average, returning
ANSI, 62–63
MySQL, 318
optimizing, 632
Oracle, 91–92
PostgreSQL, 372
Sybase, 273
view, using, 620–621
bit status, determining using binary calculation, 124
center point of object, returning, 405
circle
diameter, returning, 405–406
radius, returning, 408
cosine, returning, 75, 280, 326, 392
cotangent, returning, 75–76, 280, 326, 392

cube root, returning, 391
date difference, calculating, 115, 118, 199, 262
degree/radian conversion
ANSI, 76
IBM DB2, 70, 71
Microsoft SQL Server, 70, 71
MySQL, 326–327, 331
PostgreSQL, 393, 395–396
Sybase, 280–281, 283
exponentiation
ANSI, 76–77, 79–80
MySQL, 327, 330–331
PostgreSQL, 393, 395
Sybase, 281, 282–283
factorial, returning, 428–429, 488–489, 523–524, 586–587
function, mathematical
ANSI, 69–72
ESQL, 586–587
PostgreSQL, 388–389
Sybase, 275–277
hyperbolic cosine, returning, 75
hyperbolic sine, returning, 72, 82
hyperbolic tangent, returning, 72, 83–84
least-squares-fit linear equation, 44
line length, returning, 407
logarithm
ANSI, 77
MySQL, 329
PostgreSQL, 394
Sybase, 281–282
modulo, 77–78, 125, 329–330, 394–395
path, 406–408
PI constant, 79, 282, 330, 395
polygon
box height, returning, 406
box width, returning, 408
boxes, returning intersection of two, 405
corner points, returning number of, 407
sign (positive/negative) of value, returning
ANSI, 81–82
MySQL, 332
Oracle, 125–126
PostgreSQL, 397
Sybase, 285
sine, returning, 285, 332, 397
square root, returning
ANSI, 83
IBM DB2, 47, 457
Microsoft SQL Server, 47
MySQL, 332

- Oracle, 47
 - PostgreSQL, 398
 - Sybase, 286
 - UDF, using, 457, 458
 - standard deviation, returning, 43, 95–96, 332–333, 374
 - sum
 - ANSI, 65
 - MySQL, 319
 - Oracle, 96
 - PostgreSQL, 374–375
 - Sybase, 275
 - tangent, returning, 72, 83, 279, 286, 333
 - timestamp difference, calculating, 159
 - variance, returning, 43, 93, 375
 - 0 (zero) division error, 435–437, 463–464, 502, 518
 - MAX function**
 - ANSI, 61, 64
 - IBM DB2, 46
 - Microsoft SQL Server, 46
 - MySQL, 317, 319
 - Oracle, 46, 90, 95
 - PostgreSQL, 46, 371, 373
 - standard identifier, 42
 - Sybase, 46, 273, 274
 - syntax, 17
 - @MAXCHARLEN function (Sybase), 300, 306**
 - @MAX_CONNECTIONS function**
 - Microsoft SQL Server, 207, 210, 481
 - Sybase, 300, 306–307
 - MD5 function (PostgreSQL), 376, 382**
 - MDX (Multidimensional Expressions) language, 40**
 - memory**
 - address, retrieving value from, 23–24
 - image pointer, returning, 287–288
 - stack, 13–14
 - text pointer, returning, 287–288, 481
 - UGA, 438
 - variable
 - pointer, 23
 - storage in/retrieval from memory, 22–23
 - metadata function, 38**
 - MICROSECOND function (IBM DB2), 149, 155**
 - Microsoft SQL Server. See specific function and topic**
 - @MICROSOFTVERSION function (Microsoft SQL Server), 239, 241, 314**
 - MIDNIGHT_Seconds function (IBM DB2), 149, 155–156**
 - migrating data. See database, migrating**
 - MIN function**
 - ANSI, 61, 64
 - IBM DB2, 46
 - Microsoft SQL Server, 46
 - MySQL, 317, 319
 - Oracle, 46, 91, 95
 - PostgreSQL, 46, 371, 374
 - standard identifier, 42
 - Sybase, 46, 273, 275
 - MINUTE function**
 - IBM DB2, 149, 156
 - MySQL, 355, 361
 - MOD function**
 - ANSI, 71, 77–78
 - IBM DB2, 46, 71
 - Microsoft SQL Server, 46
 - MySQL, 46, 321, 329–330
 - Oracle, 46, 123, 125
 - PostgreSQL, 46, 389, 394–395
 - standard identifier, 42
 - Sybase, 46
 - module**
 - compiled, 714
 - defined, 716
 - PSM, 415
 - standard, 2
 - modulo, 77–78, 125, 329–330, 394–395**
 - MONTH function**
 - IBM DB2, 118, 149, 156–157
 - Microsoft SQL Server, 198, 202–203
 - MySQL, 203, 355, 362
 - MONTH_BETWEEN function (Oracle), 115, 118**
 - MONTHNAME function**
 - IBM DB2, 149, 157
 - MySQL, 355, 362
 - Multidimensional Expressions (MDX) language, 40**
 - MySQL database platform. See specific function and topic**
 - mysql.func system table, 528**
 - MySQLGUI client, 4**
- ## N
- NCHAR function (Microsoft SQL Server), 114, 186, 191**
 - @NCHARSIZE function (Sybase), 300, 307**
 - NCHR function, 99–100**
 - @NESTLEVEL function**
 - Microsoft SQL Server, 207, 211
 - Sybase, 300, 307
 - Network Data Model, 15**
 - network function, 716**
 - networking software, proprietary, 604**
 - NEWID function (Microsoft SQL Server), 179, 218, 230, 481**
 - NEW_TIME function (Oracle), 115, 118–119**
 - niladic function, 27**

NO_DATA_FOUND error, 434

NOW function

- MySQL, 355, 362
- PostgreSQL, 117, 121, 399, 403

NPOINTS function (PostgreSQL), 404, 407

NULLIF function

- ANSI, 85–86
- IBM DB2, 177, 180
- MySQL, 336, 347
- Oracle, 128, 132–133
- PostgreSQL, 409, 411

number. See also math

- base, converting, 325–326
- correlation coefficient for number pair, returning, 43, 92–93
- factorial, returning, 428–429, 488–489, 523–524, 586–587
- formatting, 112–113, 327, 630
- function, numeric
 - MySQL, 319–322
 - Oracle, 123
- integer representation, converting data type to, 165, 271
- integer, returning largest in set
 - ANSI, 74–75
 - IBM DB2, 70
 - Microsoft SQL Server, 70
 - MySQL, 327, 328
 - Oracle, 124–125
 - PostgreSQL, 373, 393
 - Sybase, 281
- integer, returning smallest in set
 - ANSI, 74–75
 - IBM DB2, 70
 - Microsoft SQL Server, 70
 - MySQL, 70
 - Oracle, 70
 - PostgreSQL, 374, 391–392
 - Sybase, 279–280
- rounding
 - ANSI, 80–81
 - MySQL, 331
 - Oracle, 119–120, 124–125, 126
 - PostgreSQL, 396–397
 - Sybase, 284
- sign (positive/negative), returning
 - ANSI, 81–82
 - MySQL, 332
 - Oracle, 125–126
 - PostgreSQL, 397
 - Sybase, 285

truncating

- ANSI, 84
- IBM DB2, 147–148
- MySQL, 333
- Oracle, 127
- PostgreSQL, 398
- value list, comparing to, 328
- value set, converting to predetermined, 341

number sign (#)

- temporary table prefix, 298
- UDF name prefix, 479

NVL function (Oracle), 128, 133

NVL2 function (Oracle), 128, 133–134

O

Object Linking and Embedding (OLE), 471, 490

object reference function, 36, 127

Object Viewer window (Query Analyzer), 498

OBJECT_ID function (Sybase), 288, 292–293

OBJECT_NAME function (Sybase), 288, 293

OCI (Oracle Call Interface), 604

OCT function (MySQL), 321, 330, 336, 347

OCTET_LENGTH function

- ANSI, 41, 46, 68
- PostgreSQL, 376, 383

ODBC (Open Database Connectivity), 602–603, 686–688, 709–710

OLE (Object Linking and Embedding), 471, 490

OmniConnect feature (ASE), 510

OPEN statement, 585

@@OPTIONS function

- Microsoft SQL Server, 207, 211
- Sybase, 300, 308

OR

- bitwise, 325
- statement, 138

Oracle Call Interface (OCI), 604

Oracle database platform. See specific function and topic

ORD function (MySQL), 337, 348

OTHERS error category, 435

OVERLAY function (PostgreSQL), 376, 383

overloading function

- IBM DB2, 26, 137–138, 471–473
- introduced, 25
- Microsoft SQL Server, 26
- MySQL, 26, 522
- Oracle, 25–26, 439–440
- package prerequisite, 440
- PostgreSQL, 538–539
- Sybase, 26

P

package, function

- Microsoft SQL Server, 25
- Oracle, 424, 428, 437–438, 446
- overloading package prerequisite, 440
- referencing, 438
- Sybase, 25
- UDF, 424, 428, 437–438, 446

@@PACKET_ERRORS function (Microsoft SQL Server), 481

@@PACK_RECEIVED function (Microsoft SQL Server), 481

@@PACK_SENT function (Microsoft SQL Server), 481

parallelism, intra-partition, 171

parameter, passing to function, 22–24, 714

PARAMETERS **view, 504**

parentheses () expression group delimiters, 532

partition connected to, returning, 173

password

- encryption, 168, 169, 241–242
- login application password processing, 608–610, 611–612
- view, replacing with asterisk display in, 646

path

- mathematical, 406–408
- statement, resolving path of dynamic, 173

PATINDEX function

- Microsoft SQL Server, 191
- Sybase, 248, 253–254

PCLOSE function (PostgreSQL), 404, 407–408

percent sign (%)

- modulo operator, 71, 78
- wildcard character, 253

PERCENTILE_CONT function, 44

PERCENTILE_DISC function, 45

PERCENT_RANK function, 34, 45

performance

- archiving older data, via, 548
- average calculation, optimizing, 632
- code, improving via removing redundant, 629
- database connection pool, improving using, 602, 631
- diagnosing performance issue, 207
- dynamic SQL overhead, 606
- extension, improving using proprietary, 47
- function, optimizing, 629–633
- index, improving using, 373
- I/O performance, optimizing, 631
- JDBC API, improving using vendor-specific, 603, 604
- procedure, optimizing, 56, 629
- query, optimizing, 140, 174, 256, 627, 630–633
- security, balancing with, 633
- transaction processing, optimizing, 627–628
- UDF performance, optimizing, 425, 442, 453, 632

period (.) UDT attribute indicator, 532

PERIOD_ADD function (MySQL), 355, 362–363

PERIOD_DIFF function (MySQL), 355, 363

permission

- application, acquiring from, 602
- bitmap, returning, 231
- denying, 478
- granting, 423, 450, 477–478
- IBM DB2, 450–451, 703–705
- Microsoft SQL Server, 218, 231, 477–478, 706
- MySQL, 521, 707
- Oracle, 422–423, 426, 699–703
- PostgreSQL, 532–533, 707–708
- Privileges System Catalog, 636
- procedure, 423
- revoking, 451, 533
- SQLJ, 509
- Sybase, 509, 706–707
- view, 617

PERMISSIONS function (Microsoft SQL Server), 218, 231

Persistent Stored Module (PSM), 415

Pg_indexes view, 645

Pg_locks view, 645

PG_PROC functions (PostgreSQL), 539–540

Pg_rules view, 645

Pg_settings view, 645

Pg_shadow system table, 646

Pg_stats view, 645

Pg_tables view, 645, 646

Pg_user view, 645, 646–647

Pg_views view, 645, 647

phone number, formatting, 630

PI function

- ANSI, 71, 79
- MySQL, 321, 330
- PostgreSQL, 389, 395
- Sybase, 277, 282

planning

- database migration, 557–558
- function development, 605–606

PL/SQL compiler, 421

PL/SQL (Procedural Language/SQL), 20. See also specific Oracle function

PL/SQL Virtual Machine (PVM), 421–422

plus sign (+) concatenation operator, 68

polygon

- box height, returning, 406
- box width, returning, 408
- boxes, returning intersection of two, 405
- corner points, returning number of, 407

POPEN function (PostgreSQL), 404, 408

POSITION function

POSITION function

PostgreSQL, 376, 383–384
standard identifier, 41

POSIX regular expression, 386

POSSTR function (IBM DB2), 141, 144

PostgreSQL database platform. See specific function and topic

POW function

MySQL, 321, 330–331
PostgreSQL, 389, 395

POWER function

ANSI, 71, 79–80
IBM DB2, 47
Microsoft SQL Server, 47
MySQL, 47, 321, 330–331
Oracle, 47
PostgreSQL, 47
standard identifier, 42
Sybase, 47, 277, 282–283

PREPARE statement, 476, 580

privilege. See permission

probe user instance ID, returning, 308

@@PROBESUID function (Sybase), 300, 308

Pro*C precompiler, 21

PROC system table, 528

procedural language

declarative language compared, 49–51
extension, 38, 39, 50, 51–57

Procedural Language/SQL (PL/SQL), 20. See also specific Oracle function

procedure. See also specific procedure

argument prefix, 298
context switch, 56
debugging, 432–433
described, 18
extended stored procedure, 55, 490
function compared, 18–19, 20, 416–417
JDBC, calling from, 711–712
nesting level, returning, 211, 307
OLE Automation procedure, 490
Oracle, 711–712
performance, optimizing, 56, 629
permission, 423
stand-alone, 437
3GL, 20–21
UDF, using in, 475, 490–492, 507–508
unfenced mode, 56

process ID, returning, 212, 309

program stack. See memory, stack

PROGRAM_ERROR error, 434

project creep, 546

PSM (Persistent Stored Module), 415

pull reporting implementation, 553

push reporting implementation, 553

PVM (PL/SQL Virtual Machine), 421–422

PWDCOMPARE function (Microsoft SQL Server), 239, 241

PWDENCRYPT function (Microsoft SQL Server), 239, 242

Q

query

ad hoc, 549–553
case sensitivity, 8
conditional statements, linking, 138
data warehouse, 567–569
date, restricting by, 17, 18
dynamic, 172, 579–581, 606
file, sending result to, 316
grouping result set
 IBM DB2, 138–139
 Microsoft SQL Server, 184, 185
 Oracle, 89, 91, 93, 94
 Sybase, 246
hint, 88, 184–185
Java-based, 607–608
looping through result set, 607
performance, optimizing, 140, 174, 256, 627, 630–633
process handle, 240–241
semidynamic, 580
sorting result set
 IBM DB2, 139
 Microsoft SQL Server, 184, 185
 Oracle, 89, 94
 Sybase, 255–256
 view, 620
static, 579
subquery, 718
syntax
 ANSI, 60
 IBM DB2, 138–140
 Microsoft SQL Server, 183–185
 MySQL, 315–317
 Oracle, 87–90
 PostgreSQL, 369–371
 Sybase, 246–247
 UDB, 138–140
System Catalog query
 IBM DB2, 641–645
 introduced, 635
 Microsoft SQL Server, 648–652
 MySQL, 655

Oracle, 636–640
 PostgreSQL, 645–647
 Sybase, 652–655
 system object, 290
 TOP N analysis, 8, 185
 UDF query function, 533–534, 549–553, 568–569
 view, filling using, 617–619, 620
 XML, returning result set as, 184

Query Analyzer software, 4, 489, 497–501

Quest Central software, 461

question mark (?) Java parameter placemaker, 612

quotation marks, double (“ ”) string delimiters, 192, 384

quotation marks, single (‘ ’)
 escape delimiters, 532
 string delimiters, 192, 384

QUOTE_IDENT function (PostgreSQL), 377, 384

QUOTE_LITERAL function (PostgreSQL), 377, 384

QUOTENAME function (Microsoft SQL Server), 186, 192

R

RADIANS function
 ANSI, 71, 76
 MySQL, 321, 331
 PostgreSQL, 395–396
 Sybase, 277, 283

RADIUS function (PostgreSQL), 404, 408

RAISE_APPLICATION_ERROR function (Oracle), 436

RAISE_ERROR function (IBM DB2), 464

RAISEERROR statement, 508

RAND function
 ANSI, 71, 79–80, 80
 IBM DB2, 80, 177, 180–181
 Microsoft SQL Server, 71, 80, 481
 MySQL, 71, 80, 322, 331
 Oracle, 71
 PostgreSQL, 71
 Sybase, 71, 277, 283–284, 288, 293–294

RANDOM function (PostgreSQL), 389, 396

random value, returning
 ANSI, 79–80
 IBM DB2, 180–181
 Microsoft SQL Server, 80, 481
 MySQL, 331
 PostgreSQL, 396
 Sybase, 283–284, 293–294

RANK function, 34, 45

RDL (Relational Database Language), 15

read, dirty, 628

register, special, 121, 167, 168, 169, 453

REGR_AVGX function, 44

REGR_AVGY function, 44

REGR_COUNT function, 43

REGR_INTERCEPT function, 44

REGR_R2 function, 44

REGR_SLOPE function, 44

REGR_SXX function, 44

REGR_SXY function, 44

REGR_SYY function, 44

regular expression, 106, 188, 250, 386

Relational Data Model, 15

Relational Database Language (RDL), 15

REMOVE JAVA statement, 517

REPEAT function
 IBM DB2, 102, 141, 145
 MySQL, 337, 348
 PostgreSQL, 377, 384–385

REPLACE function
 ANSI, 66, 69
 case sensitivity, 146
 IBM DB2, 141, 145–146
 Microsoft SQL Server, 186, 192
 MySQL, 337, 348
 Oracle, 98, 103
 PostgreSQL, 377, 385
 TRANSLATE function compared, 103, 165

REPLICATE function
 Microsoft SQL Server, 102, 186, 192–193
 Sybase, 102, 248, 254

reporting, 545–549, 553

ResultSet class, 515

RETURN statement
 IBM DB2, 427, 454, 467
 introduced, 52
 Microsoft SQL Server, 484, 508

reusability, 17

REVERSE function
 Microsoft SQL Server, 186, 193
 MySQL, 337, 349
 Sybase, 248, 254–255

REVOKE statement, 451, 533

RIGHT function
 IBM DB2, 141, 143
 Microsoft SQL Server, 186, 189
 MySQL, 337, 349
 Sybase, 248, 255

ROLLBACK statement, 447, 628

ROUND function
 ANSI, 71, 80–81
 MySQL, 331
 Oracle, 115, 119–120, 123, 126
 PostgreSQL, 389, 396
 Sybase, 277, 284

routine

- executable, 415
 - external, 417, 418
 - invocable, 415
 - UDF versus, 415
- ROUTINE_COLUMNS** **view**, 504, 505
- ROUTINE_PRIVILEGES** **view**, 542
- ROUTINES** **view**, 504, 540–542
- @@ROWCOUNT** **function**
- Microsoft SQL Server, 218, 231–232
 - Sybase, 300, 308–309
- ROWCOUNT_BIG** **function (Microsoft SQL Server)**, 218, 231–232
- RPAD** **function**
- MySQL, 337, 349
 - Oracle, 98, 101–102
 - PostgreSQL, 377, 385
- RTRIM** **function**
- IBM DB2, 141, 144–145
 - Microsoft SQL Server, 186, 190–191
 - MySQL, 337, 350
 - Oracle, 98, 102
 - PostgreSQL, 377, 386
 - Sybase, 249, 252–253

S

SADL (Simple Aggregate Definition Language), 430

sales tax calculation, 15

scalar function

- built-in, 33, 34–35, 36
- ESQL, 584–585
- UDF, 451, 452–456, 480, 482–484

schema

- current, returning, 174, 410–411
- data warehouse, 566
- E/R, 566
- ID, returning, 642
- implicit, 450, 457
- migrating, 556–557
- name, returning, 642, 643
- snowflake, 566
- star, 566
- state schema, 718
- SYSFUN, 137, 449
- SYSIBM, 137, 140, 173, 449
- timestamp, returning, 642
- UDF binding, 480, 487–488

scope

- function, 24–25
- IDENTITY column value, returning, 234

- report, 546
 - variable, 24–25, 298
- SCOPE_IDENTITY** **function (Microsoft SQL Server)**, 218, 233–234
- scrubbing, data**, 569–570
- SECOND** **function**
- IBM DB2, 149, 157
 - MySQL, 355, 363
- SEC_TO_TIME** **function (MySQL)**, 355, 363–364
- security. See also specific security mechanism**
- function scope, role in, 25
 - isolation level, returning, 172–173
 - performance, balancing with, 633
 - service
 - listing all active, 272
 - status, checking, 272
 - variable scope, role in, 25
- security identification number (SID)**, 214
- SELECT** **statement**
- ALL clause, 138, 316
 - analytical database model, processing within, 629
 - COMPUTE clause, 184, 246
 - CONNECT BY clause, 88–89
 - CUBE clause, 138–139, 185
 - DISTINCT clause, 8, 138, 184, 246, 316
 - DISTINCTROW clause, 316
 - EXCEPT clause, 370
 - FETCH FIRST clause, 140
 - FOR clause, 184, 246
 - FOR UPDATE clause, 371
 - FROM clause
 - ANSI, 60
 - IBM DB2, 138, 454
 - introduced, 7
 - MySQL, 316
 - Oracle, 88
 - PostgreSQL, 370
 - FROM DUAL clause, 73
 - FULL OUTER clause, 29
 - GROUP BY clause
 - ANSI, 60
 - IBM DB2, 138
 - Microsoft SQL Server, 185
 - MySQL, 316
 - Oracle, 89
 - PostgreSQL, 370
 - GROUPING SETS clause, 139
 - HAVING clause
 - ANSI, 60
 - IBM DB2, 138, 139

- MySQL, 316–317
- Oracle, 89
- PostgreSQL, 370
- HIGH PRIORITY clause, 316
- INTERSECT clause, 370
- INTO clause, 316, 434
- JOIN clause, 568
- LIMIT clause, 317, 370, 371
- OFFSET clause, 370
- OPTIMIZE FOR clause, 140
- OPTION clause, 184
- ORDER BY clause
 - IBM DB2, 139–140
 - introduced, 8
 - Microsoft SQL Server, 184, 185
 - MySQL, 317
 - Oracle, 89
 - PostgreSQL, 370, 371, 533
 - Sybase, 246
- ROLLUP clause, 138–139, 185
- rows returned by, returning number of, 232
- SQL_BIG_RESULT clause, 316
- SQL_CALC_FOUND_ROWS clause, 316
- START WITH clause, 88–89
- STRAIGHT_JOIN clause, 316
- syntax, 7, 60, 87–88, 138–140
- tables, joining using, 316, 370, 568
- TOP clause, 8
- UNION clause, 185, 370
- WHERE clause
 - ANSI, 60
 - IBM DB2, 138
 - introduced, 8
 - MySQL, 316–317
 - Oracle, 89
 - PostgreSQL, 370
- semicolon (;) command suffix, 532**
- semidynamic statement, 580**
- server**
 - bitmask information about current configuration, returning, 211
 - character set information, returning, 301–302, 306, 307, 313
 - connection
 - login name, returning, 214
 - login SID, returning, 214
 - logins attempted, returning number of, 208, 302–303, 481
 - simultaneous connections, returning maximum number of, 210, 306–307, 481
 - thread connection ID, returning, 366
 - current, returning, 175
 - date
 - boot date, returning, 301
 - system date, returning, 115, 120–121, 170–171, 202, 362
 - time zone, returning date in current, 42
 - language information, returning, 208–210, 305–306
 - load balancing, 311
 - lock timeout, returning, 210
 - time
 - boot time, returning, 301
 - busy time, returning, 235–236, 303, 305, 481
 - date in server time zone, returning current, 42
 - idle time, returning, 235–236, 305, 481
 - system time, returning, 27–28, 115, 120–121, 202
 - tick, returning, 236, 310, 481
 - user
 - information about, returning, 294–295, 308
 - validating user ID, 298–299
- session**
 - application name of current, returning, 219
 - debugger/debuggee, 715
 - ID of current, returning, 212
 - identifier, returning, 128, 134
 - time zone
 - returning, 114, 116–117
 - returning current date/time in, 42
 - transactions pending, returning number of, 232–233
 - user, returning, 176–177, 225–226, 412
 - workstation ID, returning, 227
- SESSIONTIMEZONE function (Oracle), 114, 116–117**
- SESSION_USER function**
 - IBM DB2, 176–177
 - PostgreSQL, 409, 412
- SETSEED function (PostgreSQL), 389, 397**
- SHOW CREATE FUNCTION statement, 526–529**
- SHOW_SEC_SERVICES function (Sybase), 271, 272**
- SID (security identification number), 214**
- SIGN function**
 - ANSI, 71, 81–82
 - MySQL, 332
 - Oracle, 123, 125–126
 - PostgreSQL, 389, 397
 - Sybase, 277, 285
- SIGNAL statement, 52**
- Simple Aggregate Definition Language (SADL), 430**
- SIN function**
 - MySQL, 322, 332
 - PostgreSQL, 389
- sine, returning, 285, 332, 397**
- SINH function**
 - ANSI, 72, 82
 - Sybase, 277, 285

SMALLINT function (IBM DB2)

SMALLINT function (IBM DB2), 163, 165

snowflake schema, 566

SORTKEY function (Sybase), 249, 252, 255–256

SOUNDEX function

difference between two SOUNDEX values, returning, 188–189, 252

IBM DB2, 141, 146

Microsoft SQL Server, 186, 193–194

MySQL, 337, 350

Oracle, 98, 103–104

Sybase, 249, 257

SPACE function

IBM DB2, 141, 146–147

Microsoft SQL Server, 186, 194

Sybase, 249

sp_addextendedproperty procedure, 503

sp_depends procedure, 503, 519

sp_dropextendedproperty procedure, 503

special register, 121, 167, 168, 169, 453

sp_help procedure, 503, 519

sp_helpjava procedure, 519

sp_helpprotect procedure, 519

sp_helptext procedure, 503

@@SPID function

Microsoft SQL Server, 207, 211–212

Sybase, 300, 309

spnc_makefile.mk file, 441–442

sp_OA procedures, 490

sp_rename procedure, 496

sp_trace_generateevent procedure, 501

sp_updateextendedproperty procedure, 503

sp_who procedure, 212

SQL Query Analyzer software, 4, 489, 497–501

SQL Server. See specific function and topic

SQLCA (SQL communications area), 581

SQLCODE special register, 463, 465

SQLJ (Structured Query Language for Java)

CREATE FUNCTION statement syntax, 510–513

data type, 513, 514–516

function

altering, 516–517

debugging, 517

deterministic/non-deterministic, 512

dropping, 517

error handling, 517–518

information about, returning, 518–519

null value, handling, 513–514

permission, 509

UDF, 510–511

JDBC requirement, 54

JVM requirement, 54

licensing, 509

standard, 54

SQL*Plus client (Oracle), 4, 432, 433, 442, 443

SQLPlus Worksheet client (Oracle), 4

SQLSTATE special register, 463, 465

@@SQLSTATUS function (Sybase), 300, 309–310

SQRT function

ANSI, 72, 83

IBM DB2, 47

Microsoft SQL Server, 47

MySQL, 47, 322, 332

Oracle, 47

PostgreSQL, 47, 389, 398

standard identifier, 42

Sybase, 47, 277, 286

SQUARE function (ANSI), 72, 82

standard deviation, returning, 43, 95–96, 332–333, 374

star schema, 566

statement. See also specific statement

case sensitivity, 7–8

clause, 7

compound, 51

database connection pooling environment, execution in, 602

dynamic

Explain information, enabling/disabling, 172

index, recommended, 172

intra-partition parallelism degree, returning, 171

path, resolving, 173

query, 172, 579–581, 606

schema, returning current, 174

transform group used, returning, 171

UDF, executing from, 507

ESQL, 578–579

rows affected by, returning number of, 231–232

semidynamic, 580

transaction, statement grouping within, 628

static SQL, 579

station, 717

STD function (MySQL), 322, 332–333

STDDEV function

MySQL, 322, 332–333

Oracle, 91, 95–96

PostgreSQL, 371, 374

STDDEV_POP function

IBM DB2, 47

Oracle, 47

standard identifier, 43

STDDEV_SAMP function

IBM DB2, 47

Oracle, 47

standard identifier, 43

- STDEV function**
 Microsoft SQL Server, 93
 MySQL, 93
- STDEVP function (Microsoft SQL Server), 93**
- STR function**
 Microsoft SQL Server, 187, 194–195
 Sybase, 249, 257–258
- string function**
 ANSI, 65–66
 ESQL, 589–590
 IBM DB2, 140–141
 Microsoft SQL Server, 37, 185–187
 MySQL, 39, 333–338
 PostgreSQL, 40, 375–377
 Sybase, 37, 247–249
- STR_REPLACE function (Sybase), 69**
- Structured Query Language for Java. See SQLJ stub, 718**
- STUFF function**
 Microsoft SQL Server, 187, 195
 Sybase, 249, 258–259
- subscription reporting implementation, 553**
- SUBSTR function**
 IBM DB2, 141, 147
 Oracle, 99, 104–105
- SUBSTR2 function (Oracle), 104**
- SUBSTR4 function (Oracle), 104**
- SUBSTRB function (Oracle), 104**
- SUBSTRC function (Oracle), 104**
- SUBSTRING function**
 IBM DB2, 46
 Microsoft SQL Server, 46, 187, 196
 MySQL, 338, 350–351
 Oracle, 46
 PostgreSQL, 46, 377, 386
 standard identifier, 41
 Sybase, 46, 249, 259
- SUBSTRING_INDEX function (MySQL), 338, 351**
- SUM function**
 ANSI, 61, 65
 IBM DB2, 46
 Microsoft SQL Server, 46
 MySQL, 317, 319
 Oracle, 46, 91, 96
 PostgreSQL, 46, 371, 374–375
 standard identifier, 42
 Sybase, 46, 273, 275
- superaggregate, 94**
- SUSER_ID function**
 Microsoft SQL Server, 134
 Sybase, 134, 288, 294–295
- SUSER_NAME function (Sybase), 288, 295**
- SUSER_SID function (Microsoft SQL Server), 213, 214**
- SUSER_SNAME function (Microsoft SQL Server), 213, 214**
- SWITCH statement, 524**
- Sybase database platform. See specific function and topic**
- SYSCAT.COLUMNS view, 641**
- SYSCAT.DBAUTH view, 641**
- SYSCAT.FUNCTIONS view, 474, 641–642**
- SYSCAT.INDEXCOLUSE view, 641**
- SYSCAT.PROCEDURES view, 474, 641**
- SYSCAT.ROUTINES view, 474**
- SYSCAT.SCHEMATA view, 641, 642–643**
- SYSCAT.TABAUTH view, 641**
- SYSCAT.TABLES view, 641, 643–644**
- SYSCAT.VIEWS view, 641, 644–645**
- SYSCHEMSETS system table, 256**
- SYSCOLUMNS system table, 648, 649, 653–654**
- SYSCOMMENTS system table, 506–507, 648, 649–650**
- SYSCONSTRAINTS system table, 506**
- SYSDATABASES system table, 205, 292**
- SYSDATE function**
 MySQL, 355, 362
 Oracle, 115, 120–121
- SYSDEPENDS system table, 506**
- SYSDOMAIN system table, 653, 654**
- SYSFILES system table, 206**
- SYSFUN schema, 137, 449**
- SYSIBM schema, 137, 140, 173, 449**
- SYSLOGINS system table, 294, 298**
- SYSOBJECTS system table, 290, 293, 505–506, 648, 650–651**
- SYSSTAT.ROUTINES view, 474**
- SYSTABLE system table, 653, 654–655**
- System Catalog. See also specific system table and view**
 Column catalog, 636
 IBM DB2, 641–645
 introduced, 635
 Microsoft SQL Server, 648–652
 MySQL, 655
 Oracle, 636–640
 PostgreSQL, 645–647
 Privileges catalog, 636
 Sybase, 652–655
 table information, returning from, 636–639, 641, 646, 653–655
 UDF information, returning from, 641–642
 view information, returning from, 636, 639–640, 644–645, 647, 654–655
- system function, 492–493, 718, 719**
- system resource, 718**
- system UDF, 492–495**
- SYSTEMTIMESTAMP function, 117**
- SYSUSERS system table, 216, 648, 651–652**

T

table. See also specific table

- alias, assigning, 181
- column
 - adding, 6
 - data type, assigning, 6
 - data warehouse column input, filtering, 569
 - function, column, 35, 37, 621
 - IDENTITY column, 6, 228–229, 234, 304
 - length, returning, 204–205, 289–290
 - name, assigning, 6
 - name, returning, 290
 - random value, populating with using generated SQL, 594–598
 - removing, 6
 - updating, 10
 - value within, returning minimum, 42
- constraint, returning, 643
- creating, 5–6
- data warehouse implementation, in
 - designing table for, 566–567, 571
 - filtering column input, 569
 - joining tables, 568
- dual, 73, 425
- ESQL, updating in, 580–581
- function, table, 37
- information about, returning from System Catalog, 636–639, 641, 646, 653–655
- joining
 - data warehouse implementation, in, 568
 - information about join, returning, 637
 - Microsoft SQL Server, 485
 - outer, 717
 - SELECT statement, using, 316, 370, 568
 - view, using, 623
- name, returning, 638
- refreshing, 174
- row
 - adding, 9
 - aggregate, 94
 - count, returning in ANSI, 63–64
 - count, returning in IBM DB2, 46, 643
 - count, returning in Microsoft SQL Server, 231–232
 - count, returning in MySQL, 318
 - count, returning in Oracle, 93–94
 - count, returning in PostgreSQL, 373
 - count, returning in Sybase, 274, 308–309
 - count, using to verify database migration success, 563
 - ESQL single-row function, 582–583
 - function, rowset, 717
 - interpolation, 44
 - number of rows affected by statement, returning, 231–232
 - rank, returning, 45
 - removing, 10–11
 - TOP N analysis, 8, 185
 - UDF row function, 536–537
 - values, returning individually versus returning as row, 606
 - summing all values in, 65, 96
 - temporary, 298, 316, 508
 - timestamp, returning, 643
 - transaction processing, locking during, 628
 - UDF, table-valued
 - FROM clause, optimizing using, 632
 - IBM DB2, 451, 454–456
 - Microsoft SQL Server, 480, 484–487
 - Oracle, 427, 430–431
 - PostgreSQL, 536–537
 - view, replacing using, 621–622
 - view
 - join, using in, 623
 - virtual table, as, 617
- TABLE_NAME function (IBM DB2), 177, 181**
- TAN function**
 - ANSI, 72, 83
 - MySQL, 322, 333
 - Sybase, 277, 286
- tangent, returning, 72, 83, 279, 286, 333**
- TANH function (ANSI), 72, 83–84**
- telephone number, formatting, 630**
- text. See also character set**
 - binary value, converting to/from string, 339, 380
 - case, converting
 - ANSI, 68
 - IBM DB2, 66
 - Microsoft SQL Server, 190, 196–197
 - MySQL, 344, 352
 - Oracle, 66
 - PostgreSQL, 66, 380–381, 387
 - Sybase, 66
 - case sensitivity
 - query, 8
 - statement, 7–8
 - comma-delimited string set, 341, 342, 346
 - comparing strings in Sybase, 250–252
 - compressing/uncompressing string, 339–340, 352–353
 - concatenating strings
 - ANSI, 67–68
 - IBM DB2, 142
 - MySQL, 340–341
 - Sybase, 266

- data type, converting to character, 108, 110–113, 165–166, 194–195
- dictionary, 251
- encryption, string, 168, 240, 382
- escaping, 114, 532
- ESQL string function, 589–590
- field string index value, returning, 341–342
- file, returning as string, 367
- function, string
 - ANSI, 65–66
 - ESQL, 589–590
 - IBM DB2, 140–141
 - Microsoft SQL Server, 37, 185–187
 - MySQL, 39, 333–338
 - PostgreSQL, 40, 375–377
 - Sybase, 37, 247–249
- generating unique string, 179
- hexadecimal representation, returning, 164, 240, 270–271, 342
- length of string, returning
 - IBM DB2, 143–144
 - Microsoft SQL Server, 189–190
 - MySQL, 68–69, 335, 344–345, 353
 - Oracle, 69
 - PostgreSQL, 68, 378–379, 381, 383
 - Sybase, 250
- multibyte, checking if character is, 348
- number expressed as string, truncating, 147–148
- padding
 - IBM DB2, 146–147
 - Microsoft SQL Server, 194, 226
 - MySQL, 346, 349
 - Oracle, 101–102
 - PostgreSQL, 381–382, 385
 - Sybase, 257
- pointer, returning, 287–288, 481
- position of pattern, returning
 - Microsoft SQL Server, 191
 - Sybase, 253–254
- position of string, returning
 - IBM DB2, 144
 - Microsoft SQL Server, 188
 - MySQL, 345
 - PostgreSQL, 383–384
 - Sybase, 249–250
- position, replacing substrng at specified
 - IBM DB2, 142–143
 - Microsoft SQL Server, 195
 - MySQL, 342–343
 - PostgreSQL, 383
 - Sybase, 255, 258–259
- position, returning string at specified
 - IBM DB2, 143, 147
 - Microsoft SQL Server, 189, 196
 - MySQL, 343, 344, 349, 351
 - Oracle, 104–105
 - PostgreSQL, 386
- query
 - case sensitivity, 8
 - process handle, returning query text based on, 240–241
- regular expression, 106, 188, 250, 386
- repeating string
 - Microsoft SQL Server, 145, 186, 192–193
 - MySQL, 348
 - PostgreSQL, 384–385
 - Sybase, 254
- reversing string
 - Microsoft SQL Server, 193
 - MySQL, 337, 349
 - Sybase, 254–255
- search result, replacing every occurrence with specified text
 - ANSI, 69
 - IBM DB2, 145–146
 - Microsoft SQL Server, 192
 - MySQL, 348
 - Oracle, 103
 - PostgreSQL, 385
- sound representation of character, working with
 - IBM DB2, 141, 146
 - Microsoft SQL Server, 186, 193–194
 - MySQL, 337, 350
 - Oracle, 98, 103–104
 - Sybase, 249, 252, 257
- template, translating from, 105–106
- trimming
 - IBM DB2, 141, 144–145
 - Microsoft SQL Server, 186, 190–191
 - MySQL, 336, 346, 350, 352
 - Oracle, 98, 102
 - PostgreSQL, 378, 382, 386, 387
 - Sybase, 248, 252–253
- TEXTPTR function**
 - Microsoft SQL Server, 481
 - Sybase, 287
- TEXTVALID function (Sybase), 287–288**
- thread server connection ID, returning, 366**
- 3GL (third-generation language)**
 - ESQL, using in, 577, 578
 - 4GL compared, 19
 - procedure, 20–21

time

- clock, considerations when resetting, 179
- current, returning
 - IBM DB2, 175
 - Microsoft SQL Server, 202, 481
 - MySQL, 356, 362
 - Oracle, 120–121
 - PostgreSQL, 400, 402–403
 - Sybase, 264
 - system time, 27–28, 115, 120–121, 202
 - time zone, of specified, 42, 118–119
 - UTC time, 202, 481
- current, returning interval between timestamp and, 399–400
- ESQL time function, 588–589
- field, returning time value from, 117–118, 401
- finite, checking if interval is, 402
- formats supported, 198
- formatting
 - IBM DB2, 154
 - Microsoft SQL Server, 198, 200–201
 - MySQL, 358–359, 364
 - Oracle, 119, 122
 - Sybase, 267
- hour
 - adding to/subtracting from input argument, 261, 357
 - returning hour part of time value, 153–154, 200, 361
 - second value, converting to/from hours, minutes, and seconds, 363, 364
- I/O busy time, returning, 305
- ISO format, 154, 160
- microsecond, adding to/subtracting from input argument, 357
- millisecond part of time value, returning, 155, 200
- minute
 - adding to/subtracting from input argument, 357
 - returning minute part of time value, 156, 200, 361
 - second value, converting to/from hours, minutes, and seconds, 363, 364
- second
 - adding to/subtracting from input argument, 357
 - hours, minutes, and seconds, converting second value to/from, 363, 364
 - midnight, returning seconds from, 155–156
 - returning second part of time value, 157, 200, 363
- server
 - boot time, returning, 301
 - busy time, returning, 235–236, 303, 305, 481
 - date in server time zone, returning current, 42
 - idle time, returning, 235–236, 305, 481
 - system time, returning, 27–28, 115, 120–121, 202
 - tick, returning, 236, 310, 481

timestamp

- calculating difference between two timestamps, 159
- comparing two timestamps, 243, 295–296
- current, returning, 175–176, 225, 295, 402
- database instance timestamp, returning, 225
- date/time value, returning from, 42, 117, 158, 400–401
- finite, checking if, 402
- IBM DB2, 159
- interval between current time and, returning, 399–400
- ISO format, 160
- Microsoft SQL Server, 159
- schema timestamp, returning, 642
- Sybase, 159
- table timestamp, returning, 643
- truncating, 401
- UNIX timestamp, returning, 361, 365
- truncating time value, 115, 121–122, 401
- UTC, 117, 176, 202, 481
- zone
 - current, returning, 176
 - current time at specified zone, returning, 42, 118–119
 - database time zone, returning, 116–117
 - server time zone, returning current date in, 42
 - session time zone, returning, 114, 116–117
 - session time zone, returning current date in, 42
 - session time zone, returning current time in, 42
 - timestamp, extracting from, 117
 - UTC, calculating difference from, 176

TIME function (IBM DB2), 149, 157–158

TIME_DIFF function (MySQL), 118

TIME_FORMAT function (MySQL), 356, 364

TIMEOFDAY function (PostgreSQL), 399, 403

TIMESTAMP function (IBM DB2), 149, 158

TIMESTAMPDIFF function (IBM DB2), 149, 159

TIMESTAMP_FORMAT function (IBM DB2), 150, 160

TIMESTAMP_ISO function (IBM DB2), 150, 160

@@TIMETICKS function

- Microsoft SQL Server, 235, 236, 481
- Sybase, 300, 310

TIME_TO_SEC function (MySQL), 356, 364

TOAD integrated development environment, 718

TO_CHAR function (Oracle), 106, 110–113

TO_DAYS function (MySQL), 356, 364–365

TO_NCHAR function (Oracle), 113

Tools ⇨ Object Browser ⇨ Show/Hide (Query Analyzer), 497

TOO_MANY_ROWS error, 434

TOP N analysis, 8, 185

@@TOTAL_ERRORS function

- Microsoft SQL Server, 235, 236–237, 481
- Sybase, 300, 310–311

@@TOTAL_READ function

Microsoft SQL Server, 235, 237, 481
 Sybase, 300, 311

@@TOTAL_WRITE function

Microsoft SQL Server, 235, 237–238, 481
 Sybase, 300, 311

ToUpper function (UNIX), 14**@@TRANCHAINED function (Sybase), 300, 311–312****@@TRANCOUNT function**

Microsoft SQL Server, 218, 232–233
 Sybase, 300, 312

transaction

application, transaction heavy, 605
 chained mode, 311–312
 committing, 447, 503, 628
 database, transactional, 628
 locking table during processing, 628
 nesting level, returning, 312
 performance, optimizing, 627–628
 read, dirty, 628
 rolling back, 447, 628
 session, returning number of pending transactions for, 232–233
 statement grouping within, 628
 status, returning, 312–313
 UDF, using
 IBM DB2, 473
 Microsoft SQL Server, 502, 507
 MySQL, 522
 Oracle, 440, 447
 workstation ID of current session, tracking using, 227

Transact-SQL (T-SQL) language, 3, 54–55, 226, 245.

See also specific Microsoft SQL Server function

transform group, returning, 171**TRANSLATE function**

IBM DB2, 46, 165–166
 Microsoft SQL Server, 46
 Oracle, 46, 99, 105–106, 107, 113
 PostgreSQL, 46
 REPLACE function compared, 103, 165
 standard identifier, 41
 Sybase, 46
 wildcard, using, 165

@@TRANSTATE function (Sybase), 300, 312–313**TRIM function**

MySQL, 338, 352
 Oracle, 99, 102, 145
 PostgreSQL, 377, 387
 standard identifier, 41

TRUNC function

ANSI, 72, 84
 IBM DB2, 141, 147–148

number usage, 72, 84, 123, 127
 Oracle, 115, 121–122, 123, 127
 PostgreSQL, 389, 398

TRUNCATE function

ANSI, 72, 84
 IBM DB2, 141, 147–148
 MySQL, 322, 333

try-catch block, 611, 612**TSEQUAL function**

Microsoft SQL Server, 239, 242–243
 Sybase, 289, 295–296

T-SQL (Transact-SQL) language, 3, 54–55, 226, 245.

See also specific Microsoft SQL Server function

TYPE_ID function (IBM DB2), 178, 182**TYPE_NAME function (IBM DB2), 178, 182****U****UCASE function**

IBM DB2, 197
 MySQL, 338, 352

UDB (Universal Database). See also specific IBM DB2 function

ANSI compliance, 16
 data type conversion, implicit, 138, 142
 date formats available, 154
 platform support, 137
 query syntax, 138–140
 register, special, 121, 167, 168, 169, 453
 SYSIBM schema, 137, 140, 173, 449

UDF (user-defined function)

aggregate, 427, 430
 altering
 IBM DB2, 459
 Microsoft SQL Server, 495–496
 MySQL, 525
 Oracle, 431–432
 SQLJ, 516–517
 Sybase, 516–517
 argument
 data type, 425, 510
 Oracle, 424–425, 426
 Sybase, 510
 array static value support, declaring, 418
 built-in function
 Microsoft SQL Server UDF, using in, 481
 overriding, 458–459
 performance compared, 633
 system UDF, 492–493
 calling, 445–447, 483, 523, 543
 compilation
 interpreted mode, 432, 441, 443
 native, 422, 432, 441, 443

UDF (user-defined function) (continued)

UDF (user-defined function) (continued)

- Oracle, 421–422, 431–432, 440–443
- smart, 422
- data type
 - argument, 425, 510
 - UDT, using, 476, 479, 534–536
- data warehouse implementation using
 - concatenation, 574–575
 - disassembling/reassembling data, 575–576
 - query, 568–569
 - standardization, 570–572
 - summarization, 572–574
- database object, as, 443
- debugging
 - IBM DB2, 461–463
 - Microsoft SQL Server, 497–501
 - MySQL, 526
 - Oracle, 432–434
 - PostgreSQL, 538
 - SQLJ, 517
 - Sybase, 517
- deterministic/non-deterministic, declaring
 - ANSI, 418
 - IBM DB2, 452
 - Microsoft SQL Server, 481, 507
 - MySQL, 522
 - Oracle, 426
 - Sybase, 510
- dropping
 - ANSI, 419
 - IBM DB2, 459–461
 - Microsoft SQL Server, 496–497
 - MySQL, 526
 - Oracle, 432
 - PostgreSQL, 537–538
 - SQLJ, 517
 - Sybase, 517
- dynamic SQL, executing from, 507
- embedded, 578
- encryption, 480, 488
- error handling
 - IBM DB2, 463–464
 - Microsoft SQL Server, 502–503
 - MySQL, 526
 - Oracle, 434–437
 - PostgreSQL, 538
 - SQLJ, 517–518
 - Sybase, 517–518
- external
 - embedded UDF, 578
 - IBM DB2, 451–452, 453
 - internal versus, 417
 - Microsoft SQL Server, 504
 - MySQL, 525, 526
 - performance, optimizing via limiting, 453
 - PostgreSQL, 531
 - Sybase, 511, 512, 519
- federated object configuration, 453
- generating SQL using, 592–593, 596–598
- identifier, unique, 452, 641
- independent, specifying as, 427
- information about, returning
 - IBM DB2, 474–475, 641–642
 - Microsoft SQL Server, 503–507
 - MySQL, 526–529
 - Oracle, 443–445
 - PostgreSQL, 533, 539–542
 - SQLJ, 518–519
 - Sybase, 518–519
 - System Catalog, from, 641–642
- inheritance, 419, 457, 538
- inline, 484–486
- introduced, 49
- Java, implementing in, 510–511, 516–519
- JDBC driver, developing using, 56
- language, declaring, 418, 511, 522
- migrating database using, 560–564
- name, assigning
 - IBM DB2, 452
 - Microsoft SQL Server, 478–480
 - Oracle, 424
 - Sybase, 510
 - uniqueness, 452, 472, 478
- null value support, 418, 513–514
- overloading
 - IBM DB2, 471–473
 - MySQL, 522
 - Oracle, 439–440
 - PostgreSQL, 538–539
- ownership, 478
- package, 424, 428, 437–438, 446
- parallel execution environment
 - IBM DB2, 453
 - Oracle, 427
- parameter
 - number of parameters, maximum, 478–479
 - value, default, 479, 483, 484
- performance, optimizing, 425, 442, 453, 632
- permission
 - IBM DB2, 450–451
 - Microsoft SQL Server, 477–478
 - MySQL, 521

- Oracle, 422–423, 426
 - PostgreSQL, 532–533
 - Sybase, 509
 - pipelined, 427, 430–431
 - predicate specification, 453
 - procedure, using, 475, 490–492, 507–508
 - query, 533–534, 549–553, 568–569
 - recursive
 - IBM DB2, 454, 476
 - Microsoft SQL Server, 488–489
 - Oracle, 428–429
 - report function, creating, 546–549
 - routine versus, 415
 - row function, 536–537
 - scalar
 - IBM DB2, 451, 452–456
 - Microsoft SQL Server, 480, 482–484
 - schema binding, 480, 487–488
 - sourced, 452, 456–457, 458–459, 473
 - SQLJ-based, 510–511
 - square root, returning using, 457, 458
 - stand-alone, 424, 437
 - SYSFUN schema, 137, 449
 - system UDF, 492–495
 - table-valued
 - FROM clause, optimizing using, 632
 - IBM DB2, 451, 454–456
 - Microsoft SQL Server, 480, 484–487
 - Oracle, 427, 430–431
 - PostgreSQL, 536–537
 - view, replacing using, 621–622
 - template
 - IBM DB2, 452, 458
 - Microsoft SQL Server, 489
 - tracing, 485, 493, 501, 588
 - transaction handling, using in
 - IBM DB2, 473
 - Microsoft SQL Server, 502, 507
 - MySQL, 522
 - Oracle, 440, 447
 - user, assigning to, 426
 - view, 443–445, 481–482, 504–507, 621–622
- UDT (user-defined type)**
- identifier, returning, 182
 - name, returning, 182
 - PostgreSQL, 534–536
 - UDF, using in, 476, 479, 534–536
- UGA (user global area) memory, 438**
- UID function (Oracle), 128, 134**
- UNCOMPRESS function (MySQL), 338, 352–353**
- UNCOMPRESSED_LENGTH function (MySQL), 338, 353**
- underscore (_)**
- UDF name prefix, 479
 - wildcard character, 253
- undocumented function, 37, 38**
- @@UNICHSIZE function (Sybase), 301, 313**
- Unicode character set**
- argument, disassembling, 110
 - data type Unicode representation, returning, 108
 - hexadecimal, 114
 - input argument, returning Unicode representation of, 108
 - number code
 - character corresponding to, returning, 191
 - character, returning corresponding number code, 196
 - scalar value, returning, 259
 - size of a Unicode character, returning, 313
 - trimming blank from Unicode string, 190
 - UCS2, 104, 114
 - UCS4, 104
- UNICODE function (Microsoft SQL Server), 187, 196**
- UNISTR function (Oracle), 107, 108, 113–114**
- Universal Database. See UDB**
- UNIX**
- shell function, 14
 - timestamp, returning, 361, 365
 - ToUpper function, 14
- UNIX_TIMESTAMP function (MySQL), 356, 365**
- UPDATE statement, 10, 507**
- UPPER function**
- ANSI, 66, 68
 - IBM DB2, 46
 - Microsoft SQL Server, 46, 196–197
 - MySQL, 352
 - Oracle, 46
 - PostgreSQL, 46, 377, 387
 - standard identifier, 41
 - Sybase, 46
- US7ASCII character set, 109**
- USCALAR function (Sybase), 196, 249, 259**
- user**
- account, migrating, 557
 - database user information returning, 213, 214–216, 296–297, 411
 - server user
 - information about, returning, 294–295, 308
 - validating user ID, 298–299
 - session user, returning, 176–177, 225–226, 412
 - System Catalog user information, returning
 - introduced, 636
 - Microsoft SQL Server, 651–652

user (continued)

Oracle, 637–638
PostgreSQL, 646–647
UDF, assigning to, 426

USER function

IBM DB2, 170, 177
Microsoft SQL Server, 213, 214–215
PostgreSQL, 409, 412
Sybase, 289, 296

user global area (UGA) memory, 438

USER_CATALOG view, 638

user-defined function. See UDF

user-defined type. See UDT

USER_ID function

Microsoft SQL Server, 213, 215
Sybase, 289, 296–297

USER_MVIEW system tables, 637

USER_NAME function

Microsoft SQL Server, 213, 215–216
Sybase, 289, 297

USER_PROCEDURES view, 444

USER_SOURCE view, 444

USER_TABLES view, 639

USER_VIEWS view, 639–640

UTC (Coordinated Universal Time), 117, 176, 202, 481

UTC_DATE function, 117

V

VALID_NAME function (Sybase), 289, 297–298

VALID_USER function (Sybase), 289, 298–299

VALUE function (IBM DB2), 178

VAR function (Microsoft SQL Server), 93

VARCHAR function (IBM DB2), 163, 166

variable

encapsulation, 715
host, 579
memory
 pointer, 23
 storage in/retrieval from, 22–23
procedural extension implementation, 51
scope, 24–25, 298

VARIANCE function

MySQL, 93
PostgreSQL, 371, 375

VARP function (Microsoft SQL Server), 93

VAR_POP function

IBM DB2, 47
Oracle, 47
standard identifier, 43

VAR_SAMP function

IBM DB2, 47
Oracle, 47
standard identifier, 43

VB (Visual Basic).Net, creating login application using, 608–611

@@VERSION function

Microsoft SQL Server, 207, 212
Sybase, 301, 313–314

VERSION function (PostgreSQL), 409, 412–413

@@VERSION_AS_INTEGER function (Sybase), 301, 314

V\$FIXED_VIEW_DEFINITION system table, 637

view. See also specific view

average, returning using, 620–621
creating, 481–482, 617–618
described, 617
grouping, 620
horizontal, 618
information about, returning from System Catalog, 636, 639–640, 644–645, 647, 654–655
materialized, 636–637
name, returning, 638
permission, 617
query, filling using, 617–619, 620
readability of data, improving using, 623
sorting, 620
table
 join, using view in, 623
 virtual table, view as, 617
UDF, 443–445, 481–482, 504–507, 621–622
updating, 619
vertical, 619

Visual Basic (VB).Net, creating login application using, 608–611

VSIZE function (Oracle), 128, 134–135

V\$TIMEZONE_NAMES performance view, 118

W

WAITFOR DELAY function

Microsoft SQL Server, 243
Sybase, 295

warehousing. See data warehouse

WEEK function (IBM DB2), 150, 160–161

WEEK_ISO function (IBM DB2), 150, 161

WHEN statement, 219

WHILE statement, 52, 523

WIDTH function (PostgreSQL), 404, 408–409

X

XML (eXtensible Markup Language), returning query result as, 184

XOR operator, 584

`xp_msver` **procedure, 212**

Y

YEAR function

IBM DB2, 150, 161–162

Microsoft SQL Server, 198, 203

Yip, Paul (*DB2 SQL Procedural Language for Linux, UNIX and Windows*), 56

Z

0 (zero) division error, 435–437, 463–464, 502, 518

