

# PostgreSQL Book Proposal

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Preface

## 1. Introduction

- (a) History of PostgreSQL
  - i. UNIVERSITY OF CALIFORNIA AT BERKELEY
  - ii. MICHAEL STONEBRAKER
  - iii. JOLLY CHEN and ANDREW YU
  - iv. POSTGRESQL GLOBAL DEVELOPMENT TEAM
- (b) Open source software
  - i. development methods
  - ii. peer review
  - iii. release process
  - iv. problem reporting
  - v. support
- (c) When to use a database
  - i. large volume
  - ii. rapid retrieval
  - iii. frequent modification
  - iv. reporting

## 2. Issuing Database Commands

- (a) Starting a database session
  - i. choosing an access method
  - ii. choosing a database
  - iii. starting a session
- (b) Controlling a session
  - i. typing in the query buffer
  - ii. displaying the query buffer
  - iii. editing the query buffer
  - iv. erasing the query buffer
- (c) Sending queries

(d) Getting help

(e) Requesting server information

## 3. Introduction to SQL

- (a) Relational Databases
  - i. tables, rows, and columns
  - ii. column types
  - iii. column selection
  - iv. row restriction
- (b) Creating tables
  - i. naming columns
  - ii. column types
- (c) Adding data with INSERT
  - i. target columns
  - ii. column types
  - iii. missing values
- (d) Viewing data with SELECT
  - i. target columns
  - ii. FROM clause
- (e) Removing data with DELETE
- (f) Modifying data with UPDATE
- (g) Restricting with WHERE
- (h) Sorting data with ORDER BY
- (i) Using NULL values

## 4. Advanced SQL Commands

- (a) Inserting data using SELECT
- (b) Aggregates: COUNT, SUM, . . .
- (c) GROUP BY with aggregates
- (d) HAVING with aggregates
- (e) Joining tables
- (f) Using table aliases

- (g) UNION clause
  - (h) UPDATE with FROM
  - (i) Subqueries
    - i. returning a single row
    - ii. returning multiple rows
    - iii. correlated Subqueries
  - (j) Transactions
    - i. BEGIN...END
    - ii. ABORT transaction
  - (k) Cursors
    - i. DECLARE
    - ii. FETCH
    - iii. CLOSE
  - (l) Indexing
    - i. usage
    - ii. types
    - iii. definition
    - iv. functional indexes
  - (m) Column defaults
  - (n) Referential integrity
    - i. primary keys
    - ii. foreign keys
  - (o) AND/OR usage
  - (p) Pattern matching
    - i. LIKE clause
    - ii. regular expressions
  - (q) Temporary tables
  - (r) Importing data
    - i. COPY
    - ii. DELIMITERS
    - iii. BINARY
    - iv. frontend COPY
5. POSTGRESQL'S Unique Features
- (a) Object ID'S (OID'S)
    - i. unique row assignment
    - ii. join usage
  - (b) Multi-Version Concurrency Control
    - i. write locks
    - ii. read locks
    - iii. concurrency
  - (c) Locking and deadlocks
    - i. need for locking
    - ii. deadlocks
  - (d) Vacuum
    - i. scheduling
    - ii. ANALYZE
  - (e) Views
    - i. creation
    - ii. limitations
  - (f) Rules
    - i. creation
    - ii. limitations
  - (g) Sequences
    - i. purpose
    - ii. creation
    - iii. management
  - (h) Triggers
    - i. purpose
    - ii. creation
  - (i) Large objects(BLOBS)
    - i. applications
    - ii. creation
    - iii. management
  - (j) Adding user-defined functions
    - i. purpose
    - ii. creation
    - iii. examples
  - (k) Adding user-defined operators
    - i. arithmetic processing
    - ii. creation
  - (l) Adding user-defined types
    - i. purpose
    - ii. creation
    - iii. indexing
  - (m) Exotic pre-installed types
    - i. date/time
    - ii. geometric
    - iii. character string
    - iv. internet

- v. internal
  - (n) Arrays
    - i. creation
    - ii. access
  - (o) Inheritance
    - i. purpose
    - ii. creation
    - iii. examples
6. Interfacing to the PostgreSQL Database
- (a) C Language API (LIBPQ)
  - (b) Embedded C (ECPG)
  - (c) C++ (LIBPQ++)
  - (d) JAVA (JDBC)
  - (e) ODBC
  - (f) PERL (PGSQL\_PERL5)
  - (g) TCL/TK (LIBPGTCL)
  - (h) PYTHON (PYGRESQL)
  - (i) Web access (PHP)
  - (j) Server-side programming
    - i. PLPGSQL
    - ii. SPI
7. PostgreSQL Administration
- (a) Creating users and databases
  - (b) Backup and restore
  - (c) Performance
  - (d) Troubleshooting
  - (e) Customization
  - (f) Access configuration
    - i. server access
    - ii. database access
    - iii. table access
  - (g) Internationalization
    - i. national character encodings
    - ii. date formats
8. Additional Resources
- (a) Frequently Asked Questions (FAQ'S)
  - (b) Mailing list support
  - (c) Supplied documentation

- (d) Commercial support
  - (e) Modifying the source code
9. Appendix: Installation
- (a) Getting PostgreSQL
    - i. FTP
    - ii. web
    - iii. CDROM
  - (b) Compiling
    - i. compiler
    - ii. RPM
  - (c) Initialization
  - (d) Starting the server
  - (e) Creating a database

## 10. Annotated Bibliography

- (a) *The Practical SQL Handbook*, Bowman et al., Addison Wesley
- (b) *Web Development with PHP and PostgreSQL, . . .*, Addison Wesley
- (c) *A Guide to The SQL Standard*, C.J. Date, Addison Wesley
- (d) *An Introduction to Database Systems*, C.J. Date, Addison Wesley
- (e) *SQL For Smarties*, Joe Celko, Morgan, Kaufmann