Chapter 1. Introduction

This introductory chapter:

- Identifies this book's purpose and audience,
- Explains how to use the book and its structure,
- Explains the syntax diagram notation, the naming and highlighting conventions used throughout the manual,
- Lists related documentation,
- Presents the product family overview.

Who Should Use This Book

This book is intended for anyone who wants to use the Structured Query Language (SQL) to access a database. It is primarily for programmers and database administrators, but it can also be used by general users using the command line processor.

This book is a reference rather than a tutorial. It assumes that you will be writing application programs and therefore presents the full functions of the database manager.

How To Use This Book

This book defines the SQL language used by DB2 Universal Database Version 7. Use it as a reference manual for information on relational database concepts, language elements, functions, the forms of queries, and the syntax and semantics of the SQL statements. The appendixes can be used to find limitations and information on important components.

How This Book is Structured

This reference manual is divided into two volumes. Volume 1 contains the following sections:

- "Chapter 1. Introduction", identifies the purpose, the audience, and the use of the book.
- "Chapter 2. Concepts" on page 9, discusses the basic concepts of relational databases and SQL.
- "Chapter 3. Language Elements" on page 63, describes the basic syntax of SQL and the language elements that are common to many SQL statements.
- "Chapter 4. Functions" on page 209, contains syntax diagrams, semantic descriptions, rules, and usage examples of SQL column and scalar functions.

- "Chapter 5. Queries" on page 393, describes the various forms of a query.
- The appendixes included in Volume 1 contain the following information:
  - "Appendix A. SQL Limits" on page 1099 contains the SQL limitations
  - "Appendix B. SQL Communications (SQLCA)" on page 1107 contains the SQLCA structure
  - "Appendix C. SQL Descriptor Area (SQLDA)" on page 1113 contains the SQLDA structure
  - "Appendix D. Catalog Views" on page 1127 contains the catalog views for the database
  - "Appendix E. Catalog Views For Use With Structured Types" on page 1231 contains the structured type catalog views for the database
  - "Appendix F. Federated Systems" on page 1245 contains options and type mappings for Federated Systems
  - "Appendix G. Sample Database Tables" on page 1259 contains the sample tables used for examples
  - "Appendix H. Reserved Schema Names and Reserved Words" on page 1279 contains the reserved schema names and the reserved words for the IBM SQL and ISO/ANS SQL92 standards
  - "Appendix I. Comparison of Isolation Levels" on page 1285 contains a summary of the isolation levels.
  - "Appendix J. Interaction of Triggers and Constraints" on page 1287 discusses the interaction of triggers and referential constraints.
  - "Appendix K. Explain Tables and Definitions" on page 1291 contains the Explain tables and how they are defined.
  - "Appendix L. Explain Register Values" on page 1325 describes the interaction of the CURRENT EXPLAIN MODE and CURRENT EXPLAIN SNAPSHOT special register values with each other and the PREP and BIND commands.
  - "Appendix M. Recursion Example: Bill of Materials" on page 1329 contains an example of a recursive query.
  - "Appendix N. Exception Tables" on page 1335 contains information on user-created tables that are used with the SET INTEGRITY statement.
  - "Appendix O. Japanese and Traditional-Chinese EUC Considerations" on page 1341 lists considerations when using EUC character sets.
  - "Appendix P. BNF Specifications for DATALINKs" on page 1349 contains the BNF specifications for DATALINKs.

Volume 2 contains the following sections:

- "Chapter 6. SQL Statements" on page 453, contains syntax diagrams, semantic descriptions, rules, and examples of all SQL statements.

- "Chapter 7. SQL Procedures" on page 1059, contains syntax diagrams, semantic descriptions, rules, and examples of SQL procedure statements.

How to Read the Syntax Diagrams

Throughout this book, syntax is described using the structure defined as follows:

Read the syntax diagrams from left to right and top to bottom, following the path of the line.

The ►►— symbol indicates the beginning of a statement.

The —► symbol indicates that the statement syntax is continued on the next line.

The ►— symbol indicates that a statement is continued from the previous line.

The —►◄ symbol indicates the end of a statement.

Required items appear on the horizontal line (the main path).

Optional items appear below the main path.

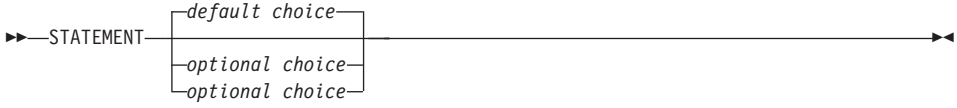
If an optional item appears above the main path, that item has no effect on the execution of the statement and is used only for readability.

If you can choose from two or more items, they appear in a stack.

If you *must* choose one of the items, one item of the stack appears on the main path.

If choosing none of the items is an option, the entire stack appears below the main path.

If one of the items is the default, it will appear above the main path and the remaining choices will be shown below.



An arrow returning to the left, above the main line, indicates an item that can be repeated. In this case, repeated items must be separated by one or more blanks.

If the repeat arrow contains a comma, you must separate repeated items with a comma.

A repeat arrow above a stack indicates that you can make more than one choice from the stacked items or repeat a single choice.

Keywords appear in uppercase (for example, `FROM`). They must be spelled exactly as shown. Variables appear in lowercase (for example, `column-name`). They represent user-supplied names or values in the syntax.

If punctuation marks, parentheses, arithmetic operators, or other such symbols are shown, you must enter them as part of the syntax.

Sometimes a single variable represents a set of several parameters. For example, in the following diagram, the variable `parameter-block` can be replaced by any of the interpretations of the diagram that is headed **parameter-block**:

parameter-block:

Adjacent segments occurring between "large bullets" (●) may be specified in any sequence.

The above diagram shows that item2 and item3 may be specified in either order. Both of the following are valid:

```
STATEMENT item1 item2 item3 item4
STATEMENT item1 item3 item2 item4
```

Conventions Used in This Manual

This section specifies some conventions which are used consistently throughout this manual.

Error Conditions

An error condition is indicated within the text of the manual by listing the SQLSTATE associated with the error in brackets. For example: A duplicate signature raises an SQL error (SQLSTATE 42723).

Highlighting Conventions

The following conventions are used in this book.

Bold	Indicates commands, keywords, and other items whose names are predefined by the system.

Italics	Indicates one of the following: • Names or values (variables) that must be supplied by the user • General emphasis • The introduction of a new term • A reference to another source of information.
`Monospace`	Indicates one of the following: • Files and directories • Information that you are instructed to type at a command prompt or in a window • Examples of specific data values • Examples of text similar to what may be displayed by the system • Examples of system messages.

Related Documentation for This Book

The following publications may prove useful in preparing applications:

- *Administration Guide*
  - Contains information required to design, implement, and maintain a database to be accessed either locally or in a client/server environment.
- *Application Development Guide*
  - Discusses the application development process and how to code, compile, and execute application programs that use embedded SQL and APIs to access the database.
- *Spatial Extender User's Guide and Reference*
  - Discusses how to write applications to create and use a geographic information system (GIS). Creating and using a GIS involves supplying a database with resources and then querying the data to obtain information such as locations, distances, and distributions within areas.
- *IBM SQL Reference*
  - This manual contains all the common elements of SQL that span across IBM's library of database products. It provides limits and rules that assist in preparing portable programs using IBM databases. It provides a list of SQL extensions and incompatibilities among the following standards and products: SQL92E, XPG4-SQL, IBM-SQL and the IBM relational database products.
- *American National Standard X3.135-1992, Database Language SQL*
  - Contains the ANSI standard definition of SQL.
- *ISO/IEC 9075:1992, Database Language SQL*
  - Contains the 1992 ISO standard definition of SQL.
- *ISO/IEC 9075-2:1999, Database Language SQL -- Part 2: Foundation (SQL/Foundation)*
  - Contains a large portion of the 1999 ISO standard definition of SQL.

- *ISO/IEC 9075-4:1999, Database Language SQL -- Part 4: Persistent Stored Modules (SQL/PSM)*
  - Contains the 1999 ISO standard definition for SQL procedure control statements.
- *ISO/IEC 9075-5:1999, Database Language SQL -- Part 4: Host Language Bindings (SQL/Bindings)*
  - Contains the 1999 ISO standard definition for host language bindings and dynamic SQL.