International Standard

ISO/IEC 19075-10

First edition
2024-10

Information technology — Guidance for the use of database language SQL —

Part 10: SQL model (Guide/Model)

Reference number
ISO/IEC 19075-10:2024(en)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Tables

Table

Page

Figures

Figure

Page

Examples

Example

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see https://www.iso.org/directives or https://www.iec.ch/members_experts/refdocs).

ISO and IEC draw attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO and IEC take no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO and IEC had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://www.iso.org/patents and https://patents.iec.ch. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see https://www.iso.org/iso/foreword.html. In the IEC, see https://www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

This document is intended to be used in conjunction with the following editions of the parts of the ISO/IEC 9075 series:

— ISO/IEC 9075-1, sixth edition or later;

— ISO/IEC 9075-2, sixth edition or later;

— ISO/IEC 9075-3, sixth edition or later;

— ISO/IEC 9075-4, seventh edition or later;

— ISO/IEC 9075-9, fifth edition or later;

— ISO/IEC 9075-10, fifth edition or later;

— ISO/IEC 9075-11, fifth edition or later;

— ISO/IEC 9075-13, fifth edition or later;

— ISO/IEC 9075-14, sixth edition or later;

— ISO/IEC 9075-15, second edition or later;

— ISO/IEC 9075-16, first edition or later.

A list of all parts in the ISO/IEC 19075 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at https://www.iso.org/members.html and https://www.iec.ch/national-committees.

Introduction

This document describes the model of database language SQL, as defined primarily in ISO/IEC 9075-1 and ISO/IEC 9075-2. It supplies some background in the form of a brief history of the relational data model, plus a brief overview of some SQL features relevant to the SQL model.

The SQL model, of course, existed from the initial definition of the language, but was not explicitly recognized until the language became sufficiently complex that appropriate vocabulary and definitions were required to accurately specify all capabilities required.

This document summarizes the result of hundreds of hours of discussion and analysis that were required in order to create a coherent and useful definition of the SQL model of operation. This document briefly outlines the Relational model popularized by E.F. Codd. However, the fundamental structure and content of this document addresses SQL language facilities such as tables, column, relationships, and operations, not the Relational model itself.

Since SQL's adoption in 1986 as a database language standard, many extensions have been proposed, defined, reviewed, modified, and adopted by members of SQL-related standards committees across the world. While the SQL model herein addresses only a small subset of the SQL language's data management facilities, SQL's overall scope includes non-relational data types, object classes, multi-level data structures, and even DBMS-generated pointers to rows that appear as if they were user-based values. Supporting all all these SQL capabilities, there exists extensive and formally-defined language constructs that (when correctly implemented by SQL database implementers) provide a data definition and processing environment that is reliable and repeatable across all SQL standard-adherent implementations.

NOTE 1 — In this document, the terms "SQL" and "SQL language" are used as synonyms. The terms "SQL standard", "ISO/IEC 9075", and "the ISO/IEC 9075 series" are used as synonyms and refer to the standard for SQL [language], which is the ISO/IEC 9075 series of standards.

Information technology — Guidance for the use of database language SQL —

Part 10:
SQL model (Guide/Model)

1 Scope

This document describes the model of database language SQL as defined in ISO/IEC 9075-1, ISO/IEC 9075-2, and ISO/IEC 9075-11. The meanings of and the relationships between various concepts of that model are described in text and illustrated graphically. Background in the form of some historical review and a brief overview of key SQL features is included.

NOTE 2 — In spite of the fact that the names of the ISO/IEC 9075 series of standards contain the phrase "database language", the standards do not use the word "database" to describe the *thing* that SQL creates and on which it operates. The word "database" is used in many different contexts and has meanings wholly unrelated to the intent of the ISO/IEC 9075 series. Consequently, a variety of other terms are defined and used by the ISO/IEC 9075 series. The word "database" is frequently used in this document informally to mean "a collection of data managed by an SQL-implementation at any given time."

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 9075-1, *Information technology — Database languages — SQL — Part 1: Framework (SQL/Framework)*

ISO/IEC 9075-2, *Information technology — Database languages — SQL — Part 2: Foundation (SQL/Foundation)*

ISO/IEC 9075-11, *Information technology — Database languages — SQL — Part 11: Information and Definition Schemas (SQL/Schemata)*