

# American National Standard

INCITS/ISO/IEC 9075-2:2016 (2017)

(ISO/IEC 9075-2:2016, IDT)

*Information technology -- Database languages  
-- SQL -- Part 2: Foundation  
(SQL/Foundation)*

**Developed by**



*Where IT all begins*



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**Adopted by INCITS (InterNational Committee for Information Technology Standards) as an American National Standard.**

Date of ANSI Approval: 12/4/2017

Published by American National Standards Institute,  
25 West 43rd Street, New York, New York 10036

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Printed in the United States of America

Fifth edition  
2016-12-15

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# Information technology — Database languages — SQL —

## Part 2: Foundation (SQL/Foundation)

*Technologies de l'information — Langages de base de données — SQL —*

*Partie 2: Fondations (SQL/Fondations)*

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Reference number  
ISO/IEC 9075-2:2016(E)





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ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
copyright@iso.org  
www.iso.org

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## 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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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 [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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

For an explanation on 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 the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, SC 32, *Data management and interchange*.

This fifth edition of ISO/IEC 9075-2 cancels and replaces the fourth edition (ISO/IEC 9075-2:2011), which has been technically revised. It also incorporates Technical Corrigenda ISO/IEC 9075-2:2011/Cor.1:2013 and ISO/IEC 9075-2:2011/Cor.2:2015.

A list of all parts in the ISO/IEC 9075 series, published under the general title *Information technology — Database languages — SQL*, can be found on the ISO website.

NOTE The individual parts of multi-part standards are not necessarily published together. New editions of one or more parts can be published without publication of new editions of other parts.

## ISO/IEC 9075-2:2016(E)

### Introduction

The organization of this part of ISO/IEC 9075 is as follows:

- 1) Clause 1, “Scope”, specifies the scope of this part of ISO/IEC 9075.
- 2) Clause 2, “Normative references”, identifies additional standards that, through reference in this part of ISO/IEC 9075, constitute provisions of this part of ISO/IEC 9075.
- 3) Clause 3, “Definitions, notations, and conventions”, defines the notations and conventions used in this part of ISO/IEC 9075.
- 4) Clause 4, “Concepts”, presents concepts used in the definition of SQL.
- 5) Clause 5, “Lexical elements”, defines the lexical elements of the language.
- 6) Clause 6, “Scalar expressions”, defines the elements of the language that produce scalar values.
- 7) Clause 7, “Query expressions”, defines the elements of the language that produce rows and tables of data.
- 8) Clause 8, “Predicates”, defines the predicates of the language.
- 9) Clause 9, “Additional common rules”, specifies the rules for assignments that retrieve data from or store data into SQL-data, and formation rules for set operations.
- 10) Clause 10, “Additional common elements”, defines additional language elements that are used in various parts of the language.
- 11) Clause 11, “Schema definition and manipulation”, defines facilities for creating and managing a schema.
- 12) Clause 12, “Access control”, defines facilities for controlling access to SQL-data.
- 13) Clause 13, “SQL-client modules”, defines SQL-client modules and externally-invoked procedures.
- 14) Clause 14, “Data manipulation”, defines the data manipulation statements.
- 15) Clause 15, “Additional data manipulation rules”, defines additional rules for data manipulation.
- 16) Clause 16, “Control statements”, defines the SQL-control statements.
- 17) Clause 17, “Transaction management”, defines the SQL-transaction management statements.
- 18) Clause 18, “Connection management” defines the SQL-connection management statements.
- 19) Clause 19, “Session management”, defines the SQL-session management statements.
- 20) Clause 20, “Dynamic SQL”, defines the SQL dynamic statements.
- 21) Clause 21, “Embedded SQL”, defines the host language embeddings.
- 22) Clause 22, “Direct invocation of SQL”, defines direct invocation of SQL language.
- 23) Clause 23, “Diagnostics management”, defines the diagnostics management facilities.
- 24) Clause 24, “Status codes”, defines values that identify the status of the execution of SQL-statements and the mechanisms by which those values are returned.



- 25) **Clause 25, “Conformance”**, defines the criteria for conformance to this part of ISO/IEC 9075.
- 26) **Annex A, “SQL Conformance Summary”**, is an informative Annex. It summarizes the conformance requirements of the SQL language.
- 27) **Annex B, “Implementation-defined elements”**, is an informative Annex. It lists those features for which the body of this part of ISO/IEC 9075 states that the syntax, the meaning, the returned results, the effect on SQL-data and/or schemas, or any other behavior is partly or wholly implementation-defined.
- 28) **Annex C, “Implementation-dependent elements”**, is an informative Annex. It lists those features for which the body of this part of ISO/IEC 9075 states that the syntax, the meaning, the returned results, the effect on SQL-data and/or schemas, or any other behavior is partly or wholly implementation-dependent.
- 29) **Annex D, “Deprecated features”**, is an informative Annex. It lists features that the responsible Technical Committee intend will not appear in a future revised version of this part of ISO/IEC 9075.
- 30) **Annex E, “Incompatibilities with ISO/IEC 9075:2011”**, is an informative Annex. It lists incompatibilities with the previous version of this part of ISO/IEC 9075.
- 31) **Annex F, “SQL feature taxonomy”**, is an informative Annex. It identifies features of the SQL language specified in this part of ISO/IEC 9075 by an identifier and a short descriptive name. This taxonomy is used to specify conformance.
- 32) **Annex G, “Defect Reports not addressed in this edition of this part of ISO/IEC 9075”**, is an informative Annex. It describes the Defect Reports that were known at the time of publication of this part of this International Standard. Each of these problems is a problem carried forward from the previous edition of ISO/IEC 9075. No new problems have been created in the drafting of this edition of this International Standard.

In the text of this part of ISO/IEC 9075, Clauses and Annexes begin new odd-numbered pages, and in **Clause 5, “Lexical elements”**, through **Clause 24, “Status codes”**, Subclauses begin new pages. Any resulting blank space is not significant.

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