INTERNATIONAL STANDARD

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First edition

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

Part 3:
SQL embedded in programs using the Java™ programming language

PROOF/ÉPREUVE

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Foreword

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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` or `www.iec.ch/members_experts/refdocs`).

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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 `www.iso.org/iso/foreword.html`. In the IEC, see `www.iec.ch/understanding-standards`.

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

This first edition of ISO/IEC 19075-3 cancels and replaces ISO/IEC TR 19075-3:2015.

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 `www.iso.org/members.html` and `www.iec.ch/-national-committees`.

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Introduction

The organization of this document is as follows:

1) Clause 1, "Scope", specifies the scope of this document.

2) Clause 2, "Normative references", identifies additional standards that, through reference in this document, constitute provisions of this document.

3) Clause 3, "Terms and definitions", defines the terms and definitions used in this document.

4) Clause 4, "Use of SQL in programs written in Java", provides a tutorial on the embedding of SQL expressions and statements in programs written in the Java™[1] programming language.

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[1] Java™ is the trademark of a product supplied by Oracle. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO or IEC of the product named.

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

Part 3:
SQL embedded in programs using the Java™ programming language

1 Scope

This document describes the support for the use of SQL within programs written in Java.

This document discusses the following features of the SQL language:

— The embedding of SQL expressions and statements in programs written in the Java programming language.

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 9075-10, *Information technology — Database languages — SQL — Part 10: Object Language Bindings (SQL/OLB)*

Java Community Process. *The Java™ Language Specification* [online]. Java SE 13 Edition. Redwood Shores, California, USA: Oracle, Available at `https://docs.oracle.com/javase/specs/jls/-se13/jls13.pdf`

Java Community Process. *JDBC™ 4.3 Specification* [online]. Edition 4.3. Redwood Shores, California, USA: Oracle, Available at `https://download.oracle.com/otn-pub/jcp/-jdbc-4_3-mrel3-eval-spec/jdbc4.3-fr-spec.pdf`

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 9075-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

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4 Use of SQL in programs written in Java

4.1 Context of SQL programs written in Java

The requirements for the material discussed in this document shall be as specified in ISO/IEC 9075-1 and ISO/IEC 9075-10.

4.2 Design goals

The following items represent the major design features of ISO/IEC 9075-1. ISO/IEC 9075-10, Java, and JDBC all specify requirements for the material discussed in this document.

— Provide a concise, legible mechanism for embedding SQL-statements in a program that otherwise conforms to Java.

— Syntactic and semantic check of SQL-statements prior to program execution.

SQL/OLB can use an implementation-defined mechanism at translate time to check embedded SQL-statements to make sure that they are syntactically and semantically correct.

— Allow the syntax and semantics of SQL-statements to be location-independent.

The syntax and semantics of SQL-statements in an SQL/OLB program do not depend on the configuration under which SQL/OLB is running. This makes it possible to implement SQL/OLB programs that run on the client, in the SQL-server, or in a middle tier.

— Provide facilities that enable the programmer to move between the SQL/OLB and JDBC environments by sharing a single SQL-connection in both environments.

— Provide for binary portability of translated and compiled Java SQL-client applications such that they can be used transparently with multiple SQL-servers. In addition, binary portability profiles allow for customization and optimization of SQL-statements within an SQL/OLB application.

4.3 Advantages of SQL/OLB over JDBC

JDBC provides a complete, low-level SQL interface from Java to SQL-implementations. SQL/OLB is designed to fill a complementary role by providing a higher-level programming interface to SQL-implementations in such a manner as to free the programmer from the tedious and complex programming interfaces found in lower-level APIs.

The following are some major differences between the two:

— SQL/OLB source programs are smaller than equivalent JDBC programs since the translator can implicitly handle many of the tedious programming chores that dynamic interfaces require.

— SQL/OLB programs can type-check SQL code at translate time using an implementation-dependent mechanism. JDBC, being a completely dynamic API, can not.