
**Information technology — Database
languages — SQL —**

**Part 13:
SQL Routines and Types Using the
Java™ Programming Language
(SQL/JRT)**

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

*Partie 13: Routines et types de SQL utilisant le langage de
programmation Java™ (SQL/JRT)*

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Contents

Page

| | |
|---|----------|
| Foreword..... | ix |
| Introduction..... | x |
| 1 Scope..... | 1 |
| 2 Normative references..... | 3 |
| 2.1 ISO and IEC standards..... | 3 |
| 2.2 Other international standards..... | 3 |
| 3 Definitions, notations, and conventions..... | 5 |
| 3.1 Definitions..... | 5 |
| 3.1.1 Definitions taken from [Java]..... | 5 |
| 3.1.2 Definitions taken from [JVM]..... | 5 |
| 3.1.3 Definitions provided in Part 13..... | 6 |
| 3.2 Conventions..... | 6 |
| 3.2.1 Specification of built-in procedures..... | 7 |
| 3.2.2 Specification of deployment descriptor files..... | 7 |
| 4 Concepts..... | 9 |
| 4.1 The Java programming language..... | 9 |
| 4.2 SQL-invoked routines..... | 10 |
| 4.2.1 Overview of SQL-invoked routines..... | 10 |
| 4.2.2 Characteristics of SQL-invoked routines..... | 10 |
| 4.3 Java class name resolution..... | 12 |
| 4.4 SQL result sets..... | 13 |
| 4.5 Parameter mapping..... | 13 |
| 4.6 Unhandled Java exceptions..... | 14 |
| 4.7 Data types..... | 15 |
| 4.7.1 Host language data types..... | 15 |
| 4.8 User-defined types..... | 15 |
| 4.8.1 Introduction to user-defined types..... | 15 |
| 4.8.2 User-defined type descriptor..... | 16 |
| 4.8.3 User-defined type comparison and assignment..... | 18 |
| 4.8.4 Accessing static fields..... | 18 |
| 4.8.5 Converting objects between SQL and Java..... | 18 |
| 4.8.5.1 SERIALIZABLE..... | 19 |
| 4.8.5.2 SQLDATA..... | 19 |
| 4.8.5.3 Developing for portability..... | 20 |
| 4.9 Built-in procedures..... | 20 |

ISO/IEC 9075-13:2008(E)

| | | |
|-----------|--|-----------|
| 4.10 | Privileges..... | 21 |
| 4.11 | JARs..... | 21 |
| 4.11.1 | Deployment descriptor files..... | 22 |
| 5 | Lexical elements..... | 23 |
| 5.1 | <token> and <separator>..... | 23 |
| 5.2 | Names and identifiers..... | 25 |
| 6 | Scalar expressions..... | 27 |
| 6.1 | <method invocation>..... | 27 |
| 6.2 | <new specification>..... | 28 |
| 7 | Predicates..... | 29 |
| 7.1 | <comparison predicate>..... | 29 |
| 8 | Additional common elements..... | 31 |
| 8.1 | <Java parameter declaration list>..... | 31 |
| 8.2 | <SQL Java path>..... | 32 |
| 8.3 | <routine invocation>..... | 34 |
| 8.4 | <language clause>..... | 43 |
| 8.5 | Execution of array-returning functions..... | 44 |
| 8.6 | Java routine signature determination..... | 51 |
| 9 | Schema definition and manipulation..... | 59 |
| 9.1 | <drop schema statement>..... | 59 |
| 9.2 | <table definition>..... | 61 |
| 9.3 | <view definition>..... | 62 |
| 9.4 | <user-defined type definition>..... | 63 |
| 9.5 | <attribute definition>..... | 67 |
| 9.6 | <alter type statement>..... | 71 |
| 9.7 | <drop data type statement>..... | 72 |
| 9.8 | <SQL-invoked routine>..... | 73 |
| 9.9 | <alter routine statement>..... | 77 |
| 9.10 | <drop routine statement>..... | 78 |
| 9.11 | <user-defined ordering definition>..... | 79 |
| 9.12 | <drop user-defined ordering statement>..... | 80 |
| 10 | Access control..... | 81 |
| 10.1 | <grant privilege statement>..... | 81 |
| 10.2 | <privileges>..... | 82 |
| 10.3 | <revoke statement>..... | 83 |
| 11 | Built-in procedures..... | 85 |
| 11.1 | SQLJ.INSTALL_JAR procedure..... | 85 |
| 11.2 | SQLJ.REPLACE_JAR procedure..... | 87 |
| 11.3 | SQLJ.REMOVE_JAR procedure..... | 89 |
| 11.4 | SQLJ.ALTER_JAVA_PATH procedure..... | 91 |
| 12 | Java topics..... | 93 |

| | | |
|----------------|---|------------|
| 12.1 | Java facilities supported by this part of ISO/IEC 9075. | 93 |
| 12.1.1 | Package java.sql. | 93 |
| 12.1.2 | System properties. | 93 |
| 12.2 | Deployment descriptor files. | 94 |
| 13 | Information Schema. | 97 |
| 13.1 | JAR_JAR_USAGE view. | 97 |
| 13.2 | JARS view. | 98 |
| 13.3 | METHOD_SPECIFICATIONS view. | 99 |
| 13.4 | ROUTINE_JAR_USAGE view. | 100 |
| 13.5 | TYPE_JAR_USAGE view. | 101 |
| 13.6 | USER_DEFINED_TYPES view. | 102 |
| 13.7 | Short name views. | 103 |
| 14 | Definition Schema. | 105 |
| 14.1 | JAR_JAR_USAGE base table. | 105 |
| 14.2 | JARS base table. | 107 |
| 14.3 | METHOD_SPECIFICATIONS base table. | 108 |
| 14.4 | ROUTINE_JAR_USAGE base table. | 110 |
| 14.5 | ROUTINES base table. | 111 |
| 14.6 | TYPE_JAR_USAGE base table. | 112 |
| 14.7 | USAGE_PRIVILEGES base table. | 113 |
| 14.8 | USER_DEFINED_TYPES base table. | 114 |
| 15 | Status codes. | 117 |
| 15.1 | SQLSTATE. | 117 |
| 16 | Conformance. | 119 |
| 16.1 | Claims of conformance to SQL/JRT. | 119 |
| 16.2 | Additional conformance requirements for SQL/JRT. | 119 |
| 16.3 | Implied feature relationships of SQL/JRT. | 119 |
| Annex A | SQL Conformance Summary (informative). | 121 |
| Annex B | Implementation-defined elements (informative). | 127 |
| Annex C | Implementation-dependent elements (informative). | 131 |
| Annex D | Deprecated features (informative). | 133 |
| Annex E | Incompatibilities with ISO/IEC 9075:2003 (informative). | 135 |
| Annex F | SQL feature taxonomy (informative). | 137 |
| Annex G | Defect reports not addressed in this edition of this part of ISO/IEC 9075 (informative). . | 139 |
| Annex H | Routines tutorial (informative). | 141 |
| H.1 | Technical components. | 141 |
| H.2 | Overview. | 142 |
| H.3 | Example Java methods: region and correctStates. | 143 |
| H.4 | Installing region and correctStates in SQL. | 143 |
| H.5 | Defining SQL names for region and correctStates. | 144 |

ISO/IEC 9075-13:2008(E)

| | | |
|----------------|---|------------|
| H.6 | A Java method with output parameters: bestTwoEmps. | 146 |
| H.7 | A CREATE PROCEDURE best2 for bestTwoEmps. | 147 |
| H.8 | Calling the best2 procedure. | 148 |
| H.9 | A Java method returning a result set: orderedEmps. | 148 |
| H.10 | A CREATE PROCEDURE rankedEmps for orderedEmps. | 150 |
| H.11 | Calling the rankedEmps procedure. | 151 |
| H.12 | Overloading Java method names and SQL names. | 152 |
| H.13 | Java main methods. | 153 |
| H.14 | Java method signatures in the CREATE statements. | 154 |
| H.15 | Null argument values and the RETURNS NULL clause. | 155 |
| H.16 | Static variables. | 157 |
| H.17 | Dropping SQL names of Java methods. | 158 |
| H.18 | Removing Java classes from SQL. | 159 |
| H.19 | Replacing Java classes in SQL. | 159 |
| H.20 | Visibility. | 160 |
| H.21 | Exceptions. | 161 |
| H.22 | Deployment descriptors. | 162 |
| H.23 | Paths. | 164 |
| H.24 | Privileges. | 166 |
| H.25 | Information Schema. | 167 |
| Annex I | Types tutorial (informative). | 169 |
| I.1 | Overview. | 169 |
| I.2 | Example Java classes. | 169 |
| I.3 | Installing Address and Address2Line in an SQL system. | 171 |
| I.4 | CREATE TYPE for Address and Address2Line. | 172 |
| I.5 | Multiple SQL types for a single Java class. | 173 |
| I.6 | Collapsing subclasses. | 174 |
| I.7 | GRANT and REVOKE statements for data types. | 176 |
| I.8 | Deployment descriptors for classes. | 176 |
| I.9 | Using Java classes as data types. | 177 |
| I.10 | SELECT, INSERT, and UPDATE. | 178 |
| I.11 | Referencing Java fields and methods in SQL. | 179 |
| I.12 | Extended visibility rules. | 179 |
| I.13 | Logical representation of Java instances in SQL. | 180 |
| I.14 | Static methods. | 181 |
| I.15 | Static fields. | 182 |
| I.16 | Instance-update methods. | 183 |
| I.17 | Subtypes in SQL/JRT data. | 184 |
| I.18 | References to fields and methods of null instances. | 185 |
| I.19 | Ordering of SQL/JRT data. | 187 |
| | Bibliography. | 189 |
| | Index. | 191 |

Tables

| Table | | Page |
|--------------|--|-------------|
| 1 | Standard programming languages. | 43 |
| 2 | System properties. | 93 |
| 3 | SQLSTATE class and subclass values. | 117 |
| 4 | Implied feature relationships of SQL/JRT. | 119 |
| 5 | Feature taxonomy for optional features. | 137 |

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 9075-13 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

This third edition of ISO/IEC 9075-13 cancels and replaces the second edition (ISO/IEC 9075-13:2003), which has been technically revised. It also incorporates Technical Corrigendum ISO/IEC 9075-13:2003/Cor.1:2005.

ISO/IEC 9075 consists of the following parts, under the general title *Information technology — Database languages — SQL*:

- Part 1: Framework (SQL/Framework)
- Part 2: Foundation (SQL/Foundation)
- Part 3: Call-Level Interface (SQL/CLI)
- Part 4: Persistent Stored Modules (SQL/PSM)
- Part 9: Management of External Data (SQL/MED)
- Part 10: Object Language Bindings (SQL/OLB)
- Part 11: Information and Definition Schema (SQL/Schemata)
- Part 13: SQL Routines and Types Using the Java™ Programming Language (SQL/JRT)
- Part 14: XML-Related Specifications (SQL/XML)

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 Java routines and types.
- 5) **Clause 5, “Lexical elements”**, defines a number of lexical elements used in the definition of Java routines and types.
- 6) **Clause 6, “Scalar expressions”**, defines the elements of the language that produce scalar values.
- 7) **Clause 7, “Predicates”**, defines the predicates of the language.
- 8) **Clause 8, “Additional common elements”**, defines additional language elements that are used in various parts of the language.
- 9) **Clause 9, “Schema definition and manipulation”**, defines the schema definition and manipulation statements associated with the definition of Java routines and types.
- 10) **Clause 10, “Access control”**, defines facilities for controlling access to SQL-data.
- 11) **Clause 11, “Built-in procedures”**, defines new built-in procedures used in the definition of Java routines and types.
- 12) **Clause 12, “Java topics”**, defines the facilities supported by implementations of this part of ISO/IEC 9075 and the conventions used in deployment descriptor files.
- 13) **Clause 13, “Information Schema”**, defines viewed tables that contain schema information.
- 14) **Clause 14, “Definition Schema”**, defines base tables on which the viewed tables containing schema information depend.
- 15) **Clause 15, “Status codes”**, defines SQLSTATE values related to Java routines and types.
- 16) **Clause 16, “Conformance”**, defines the criteria for conformance to this part of ISO/IEC 9075.
- 17) **Annex A, “SQL Conformance Summary”**, is an informative Annex. It summarizes the conformance requirements of the SQL language.
- 18) **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.
- 19) **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.

- 20) **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.
- 21) **Annex E, “Incompatibilities with ISO/IEC 9075:2003”**, is an informative Annex. It lists incompatibilities with the previous version of this part of ISO/IEC 9075.
- 22) **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 and may be used to develop other profiles involving the SQL language.
- 23) **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.
- 24) **Annex H, “Routines tutorial”**, is an informative Annex. It provides a tutorial on using the features defined in this part of ISO/IEC 9075 for defining and using SQL-invoked routines based on Java static methods.
- 25) **Annex I, “Types tutorial”**, is an informative Annex. It provides a tutorial on using the features defined in this part of ISO/IEC 9075 for defining and using SQL structured types based on Java classes.

In the text of this part of ISO/IEC 9075, Clauses begin a new odd-numbered page, and in **Clause 5, “Lexical elements”**, through **Clause 16, “Conformance”**, Subclauses begin a new page. Any resulting blank space is not significant.

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Information technology — Database languages — SQL —

Part 13:

SQL Routines and Types Using the Java™ Programming Language (SQL/JRT)

1 Scope

This part of ISO/IEC 9075 specifies the ability to invoke static methods written in the Java™ programming language as SQL-invoked routines and to use classes defined in the Java programming language as SQL structured user-defined types. (Java is a registered trademark of Sun Microsystems, Inc.)

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2 Normative references

The following referenced documents are indispensable for the application 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.

2.1 ISO and IEC standards

[ISO9075-1] ISO/IEC 9075-1:2008, *Information technology — Database languages — SQL — Part 1: Framework (SQL/Framework)*.

[ISO9075-2] ISO/IEC 9075-2:2008, *Information technology — Database languages — SQL — Part 2: Foundation (SQL/Foundation)*.

[ISO9075-10] ISO/IEC 9075-10:2008, *Information technology — Database languages — SQL — Part 10: Object Language Bindings (SQL/OLB)*.

[ISO9075-11] ISO/IEC 9075-11:2008, *Information technology — Database languages — SQL — Part 11: Information and Definition Schemas (SQL/Schemata)*.

2.2 Other international standards

[Java] *The Java™ Language Specification, Third Edition*, James Gosling, Bill Joy, Guy Steele, and Gilad Bracha, Prentice Hall, June 14, 2005, ISBN 0-321-24678-0.

[JVM] *The Java™ Virtual Machine Specification, Second Edition*, Tim Lindholm and Frank Yellin, Addison-Wesley, 1999, ISBN 0-201-43294-3, as amended by *Clarifications and Amendments to the Java Virtual Machine Specification*, http://java.sun.com/docs/books/jvms/second_edition/jvms-clarify.html.

[J2SE] *Java™ 2 Platform Standard Edition 5.0 API Specification*, <http://java.sun.com/j2se/1.5.0/docs/api/index.html>.

[Serialization] *Java™ Object Serialization Specification*, version 1.5.0 <http://java.sun.com/j2se/1.5.0/docs/guide/serialization/spec/serial-TOC.html>.

[JDBC] *JDBC™ 4.0 Specification*, Final v1.0, Lance Andersen, Sun Microsystems, Inc., November 7, 2006.