

# ISO/IEC 19075-4:2021-08 (E)

## Information technology - Guidance for the use of database language SQL - Part 4: Routines and types using the Java™ programming language

---

Contents	Page
Foreword. . . . .	v
Introduction. . . . .	vii
<b>1 Scope. . . . .</b>	<b>1</b>
<b>2 Normative references. . . . .</b>	<b>2</b>
<b>3 Terms and definitions. . . . .</b>	<b>3</b>
<b>4 Routines tutorial. . . . .</b>	<b>4</b>
4.1 Context of routines. . . . .	4
4.2 Technical components. . . . .	4
4.3 Overview. . . . .	5
4.4 Example Java methods: region and correctStates. . . . .	5
4.5 Installing region and correctStates in SQL. . . . .	6
4.6 Defining SQL names for region and correctStates. . . . .	7
4.7 A Java method with output parameters: bestTwoEmps. . . . .	8
4.8 A CREATE PROCEDURE best2 for bestTwoEmps. . . . .	10
4.9 Calling the best2 procedure. . . . .	10
4.10 A Java method returning a result set: orderedEmps. . . . .	11
4.11 A CREATE PROCEDURE rankedEmps for orderedEmps. . . . .	12
4.12 Calling the rankedEmps procedure. . . . .	13
4.13 Overloading Java method names and SQL names. . . . .	14
4.14 Java main methods. . . . .	15
4.15 Java method signatures in the CREATE statements. . . . .	16
4.16 Null argument values and the RETURNS NULL clause. . . . .	17
4.17 Static variables. . . . .	19
4.18 Dropping SQL names of Java methods. . . . .	20
4.19 Removing Java classes from SQL. . . . .	20
4.20 Replacing Java classes in SQL. . . . .	21
4.21 Visibility. . . . .	22
4.22 Exceptions. . . . .	22
4.23 Deployment descriptors. . . . .	23
4.24 Paths. . . . .	25
4.25 Privileges. . . . .	27
4.26 Information Schema. . . . .	28
<b>5 Types tutorial. . . . .</b>	<b>29</b>
5.1 Overview. . . . .	29
5.2 Example Java classes. . . . .	29
5.3 Installing Address and Address2Line in an SQL system. . . . .	31
5.4 CREATE TYPE for Address and Address2Line. . . . .	31
5.5 Multiple SQL types for a single Java class. . . . .	33

5.6	Collapsing subclasses. ....	33
5.7	GRANT and REVOKE statements for data types. ....	35
5.8	Deployment descriptors for classes. ....	35
5.9	Using Java classes as data types. ....	36
5.10	SELECT, INSERT, and UPDATE. ....	37
5.11	Referencing Java fields and methods in SQL. ....	38
5.12	Extended visibility rules. ....	38
5.13	Logical representation of Java instances in SQL. ....	39
5.14	Static methods. ....	40
5.15	Static fields. ....	41
5.16	Instance-update methods. ....	41
5.17	Subtypes in SQL/JRT data. ....	43
5.18	References to fields and methods of null instances. ....	44
5.19	Ordering of SQL/JRT data. ....	45
	<b>Bibliography. ....</b>	<b>48</b>
	<b>Index. ....</b>	<b>49</b>