Static & Dynamic SQL
by
K.Karthikeyan

Dynamic SQL

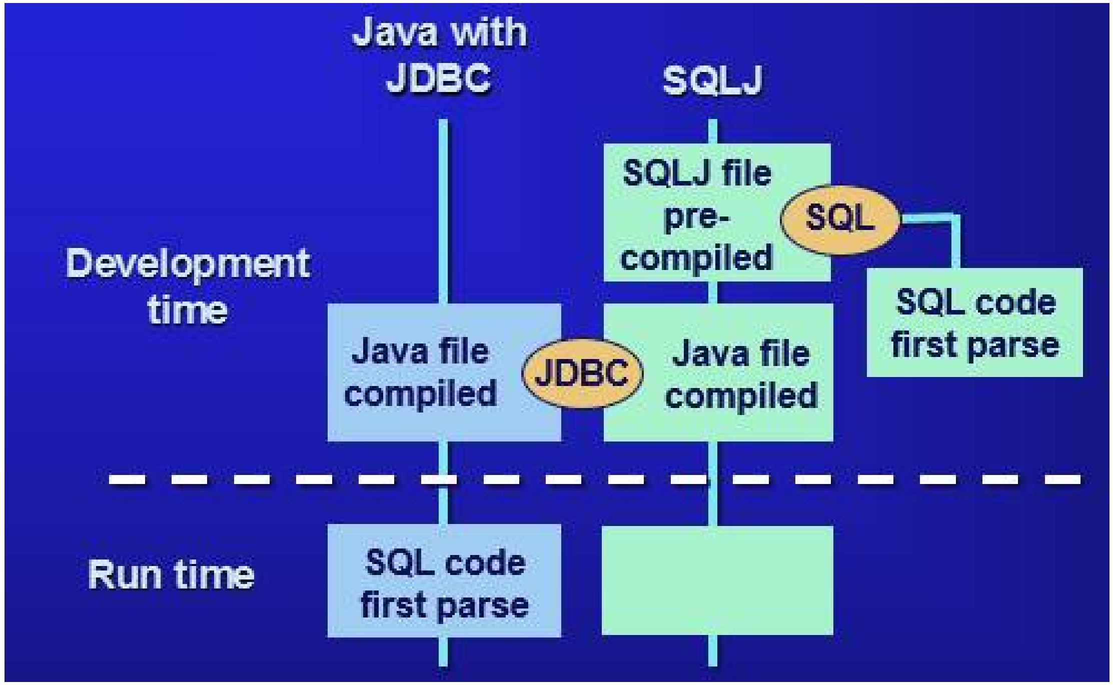
- **Static or Embedded** SQL are SQL statements in an application that do not change at runtime and, therefore, can be hard-coded into the application.
- **Dynamic** SQL is SQL statements that are constructed at runtime; for example, the application may allow users to enter their own queries.

STATIC (EMBEDDED) SQL Vs DYNAMIC SQL

S.No	**STATIC (EMBEDDED) SQL**	**DYNAMIC (INTERACTIVE) SQL**
1	Static SQL, how database will be accessed is predetermined in the embedded SQL statement.	Dynamic SQL, how database will be accessed is determined at run time.
2	It is more swift and efficient.	It is less swift and efficient.
3	SQL statements are compiled at compile time.	SQL statements are compiled at run time.
4	Parsing, Validation, Optimization and Generation of application plan are done at compile time.	Parsing, Validation, Optimization and Generation of application plan are done at run time.
5	It is less flexible.	It is more flexible.

SQLJ

- SQLJ precompiles SQL code in a Java program.
- Provides greater compile-time checking of SQL statements.
- Reduces the amount of code needed to execute SQL from within Java.



SQLJ v/s JDBC

```
// SQLJ
int n;
#sql { INSERT INTO emp VALUES (:n)};

// JDBC
int n;
Statement stmt = conn.prepareStatement
(“INSERT INTO emp VALUES (?)”);
stmt.setInt(1,n);
stmt.execute ();
stmt.close();
```

SQLJ

Loading the JDBC Driver

SQLJ requires that the JDBC driver class is loaded. This can be performed in the same way as for JDBC

```
try
{
   Class.forName("oracle.jdbc.driver.OracleDriver");
}

catch (ClassNotFoundException e)
{
  System.out.println("Could not load driver");
}
```

SQLJ

Specifying a Connection Context

- All SQLJ statements execute in a “connection context”
- Plays similar role as a Connection object does in JDBC.
- Establishes the database we are connecting to, the user name, and the password.

```
try
{
Class.forName("oracle.jdbc.driver.OracleDriver");
DefaultContext.setDefaultContext(new DefaultContext(
         "jdbc:oracle:thin:@HOSTID:1521:ORCL",
         "theUser", "thePassword") );
}
```

SQLJ

• Passing Host Variables into a SQLJ Statement

- Prefix the java variable name with a colon (:)

```
#sql {delete from EMP where SAL >= :amt};
```

When to Which ?

How do applications connect to a database?

- App ↔ DBMS: Embedded SQL
- App ↔ Driver ↔ DBMS: JDBC/ODBC or SQLJ

What mechanisms exist to retrieve/modify data?

- Static Queries: Embedded SQL, SQLJ
- Dynamic Queries: JDBC/ODBC, Dynamic SQL

Activity

S.No	**STATIC (EMBEDDED) SQL**	**DYNAMIC (INTERACTIVE) SQL**
1	Static SQL, how database will be accessed is ________________ in the embedded SQL statement.	Dynamic SQL, how database will be accessed is ___________ at run time.
2	It is _________swift and efficient.	It is _______ swift and efficient.
3	SQL statements are compiled at ____________ time.	SQL statements are compiled at ________time.
4	Parsing, Validation, Optimization and Generation of application plan are done at _________ time.	Parsing, Validation, Optimization and Generation of application plan are done at __________ time.
5	It is _________flexible.	It is ________flexible.

Thank you