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SQLite - Java

安装

在 Java 程序中使用 SQLite 之前，我们需要确保机器上已经有 SQLite JDBC Driver 驱动程序和 Java。可以查看 Java 教程了解如何在计算机上安装 Java。现在，我们来看看如何在机器上安装 SQLite JDBC 驱动程序。

- 从 sqlite-jdbc 库下载 *sqlite-jdbc-(VERSION).jar* 的最新版本。
- 在您的 class 路径中添加下载的 jar 文件 *sqlite-jdbc-(VERSION).jar*，或者在 -classpath 选项中使用它，这将在后面的实例中进行讲解。

在学习下面部分的知识之前，您必须对 Java JDBC 概念有初步了解。如果您还未了解相关知识，那么建议您可以先花半个小时学习下 JDBC 教程相关知识，这将有助于您学习接下来讲解的知识。

连接数据库

下面的 Java 程序显示了如何连接到一个现有的数据库。如果数据库不存在，那么它就会被创建，最后将返回一个数据库对象。

```
import java.sql.*;

public class SQLiteJDBC
{
  public static void main( String args[] )
  {
    Connection c = null;
    try {
      Class.forName("org.sqlite.JDBC");
      c = DriverManager.getConnection("jdbc:sqlite:test.db");
    } catch ( Exception e ) {
      System.err.println( e.getClass().getName() + ": " + e.getMessage() );
      System.exit(0);
    }
    System.out.println("Opened database successfully");
  }
}
```

现在，让我们来编译和运行上面的程序，在当前目录中创建我们的数据库 **test.db**。您可以根据需要改变路径。我们假设当前路径下可用的 JDBC 驱动程序的版本是 *sqlite-jdbc-3.7.2.jar*。

```
$javac SQLiteJDBC.java
$java -classpath ".:sqlite-jdbc-3.7.2.jar" SQLiteJDBC
Open database successfully
```

如果您想要使用 Windows 机器，可以按照下列所示编译和运行您的代码：

```
$javac SQLiteJDBC.java
$java -classpath ".;sqlite-jdbc-3.7.2.jar" SQLiteJDBC
Opened database successfully
```

创建表

下面的 Java 程序将用于在先前创建的数据库中创建一个表：

```
import java.sql.*;

public class SQLiteJDBC
{
  public static void main( String args[] )
  {
    Connection c = null;
    Statement stmt = null;
    try {
      Class.forName("org.sqlite.JDBC");
      c = DriverManager.getConnection("jdbc:sqlite:test.db");
      System.out.println("Opened database successfully");

      stmt = c.createStatement();
      String sql = "CREATE TABLE COMPANY " +
                   "(ID INT PRIMARY KEY     NOT NULL," +
                   " NAME           TEXT    NOT NULL, " +
                   " AGE            INT     NOT NULL, " +
                   " ADDRESS        CHAR(50), " +
                   " SALARY         REAL)";
      stmt.executeUpdate(sql);
      stmt.close();
      c.close();
    } catch ( Exception e ) {
      System.err.println( e.getClass().getName() + ": " + e.getMessage() );
      System.exit(0);
    }
    System.out.println("Table created successfully");
  }
}
```

上述程序编译和执行时，它会在 **test.db** 中创建 COMPANY 表，最终文件列表如下所示：

```
-rw-r--r--. 1 root root 3201128 Jan 22 19:04 sqlite-jdbc-3.7.2.jar
-rw-r--r--. 1 root root    1506 May  8 05:43 SQLiteJDBC.class
```

```
-rw-r--r--. 1 root root     832 May  8 05:42 SQLiteJDBC.java
-rw-r--r--. 1 root root    3072 May  8 05:43 test.db
```

INSERT 操作

下面的 Java 代码显示了如何在上面创建的 COMPANY 表中创建记录：

```
import java.sql.*;

public class SQLiteJDBC
{
  public static void main( String args[] )
  {
    Connection c = null;
    Statement stmt = null;
    try {
      Class.forName("org.sqlite.JDBC");
      c = DriverManager.getConnection("jdbc:sqlite:test.db");
      c.setAutoCommit(false);
      System.out.println("Opened database successfully");

      stmt = c.createStatement();
      String sql = "INSERT INTO COMPANY (ID,NAME,AGE,ADDRESS,SALARY) " +
                   "VALUES (1, 'Paul', 32, 'California', 20000.00 );";
      stmt.executeUpdate(sql);

      sql = "INSERT INTO COMPANY (ID,NAME,AGE,ADDRESS,SALARY) " +
            "VALUES (2, 'Allen', 25, 'Texas', 15000.00 );";
      stmt.executeUpdate(sql);

      sql = "INSERT INTO COMPANY (ID,NAME,AGE,ADDRESS,SALARY) " +
            "VALUES (3, 'Teddy', 23, 'Norway', 20000.00 );";
      stmt.executeUpdate(sql);

      sql = "INSERT INTO COMPANY (ID,NAME,AGE,ADDRESS,SALARY) " +
            "VALUES (4, 'Mark', 25, 'Rich-Mond ', 65000.00 );";
      stmt.executeUpdate(sql);

      stmt.close();
      c.commit();
      c.close();
    } catch ( Exception e ) {
      System.err.println( e.getClass().getName() + ": " + e.getMessage() );
      System.exit(0);
    }
    System.out.println("Records created successfully");
  }
}
```

上述程序编译和执行时，它会在 COMPANY 表中创建给定记录，并会显示以下两行：

```
Opened database successfully
Records created successfully
```

SELECT 操作

下面的 Java 程序显示了如何从前面创建的 COMPANY 表中获取并显示记录：

```
import java.sql.*;

public class SQLiteJDBC
{
  public static void main( String args[] )
  {
    Connection c = null;
    Statement stmt = null;
    try {
      Class.forName("org.sqlite.JDBC");
      c = DriverManager.getConnection("jdbc:sqlite:test.db");
      c.setAutoCommit(false);
      System.out.println("Opened database successfully");

      stmt = c.createStatement();
      ResultSet rs = stmt.executeQuery( "SELECT * FROM COMPANY;" );
      while ( rs.next() ) {
         int id = rs.getInt("id");
         String  name = rs.getString("name");
         int age  = rs.getInt("age");
         String  address = rs.getString("address");
         float salary = rs.getFloat("salary");
         System.out.println( "ID = " + id );
         System.out.println( "NAME = " + name );
         System.out.println( "AGE = " + age );
         System.out.println( "ADDRESS = " + address );
         System.out.println( "SALARY = " + salary );
         System.out.println();
      }
      rs.close();
      stmt.close();
      c.close();
    } catch ( Exception e ) {
      System.err.println( e.getClass().getName() + ": " + e.getMessage() );
      System.exit(0);
    }
    System.out.println("Operation done successfully");
    }
  }
```

上述程序编译和执行时，它会产生以下结果：

```
Opened database successfully
ID = 1
NAME = Paul
AGE = 32
ADDRESS = California
SALARY = 20000.0

ID = 2
NAME = Allen
AGE = 25
ADDRESS = Texas
SALARY = 15000.0

ID = 3
NAME = Teddy
AGE = 23
ADDRESS = Norway
SALARY = 20000.0

ID = 4
NAME = Mark
AGE = 25
ADDRESS = Rich-Mond
SALARY = 65000.0

Operation done successfully
```

UPDATE 操作

下面的 Java 代码显示了如何使用 UPDATE 语句来更新任何记录，然后从 COMPANY 表中获取并显示更新的记录：

```
import java.sql.*;

public class SQLiteJDBC
{
  public static void main( String args[] )
  {
    Connection c = null;
    Statement stmt = null;
    try {
      Class.forName("org.sqlite.JDBC");
      c = DriverManager.getConnection("jdbc:sqlite:test.db");
```

```
         c.setAutoCommit(false);
         System.out.println("Opened database successfully");

         stmt = c.createStatement();
         String sql = "UPDATE COMPANY set SALARY = 25000.00 where ID=1;";
         stmt.executeUpdate(sql);
         c.commit();

         ResultSet rs = stmt.executeQuery( "SELECT * FROM COMPANY;" );
         while ( rs.next() ) {
            int id = rs.getInt("id");
            String  name = rs.getString("name");
            int age  = rs.getInt("age");
            String  address = rs.getString("address");
            float salary = rs.getFloat("salary");
            System.out.println( "ID = " + id );
            System.out.println( "NAME = " + name );
            System.out.println( "AGE = " + age );
            System.out.println( "ADDRESS = " + address );
            System.out.println( "SALARY = " + salary );
            System.out.println();
         }
         rs.close();
         stmt.close();
         c.close();
       } catch ( Exception e ) {
         System.err.println( e.getClass().getName() + ": " + e.getMessage() );
         System.exit(0);
       }
       System.out.println("Operation done successfully");
     }
   }
```

上述程序编译和执行时，它会产生以下结果：

```
Opened database successfully
ID = 1
NAME = Paul
AGE = 32
ADDRESS = California
SALARY = 25000.0

ID = 2
NAME = Allen
AGE = 25
ADDRESS = Texas
SALARY = 15000.0
```

```
ID = 3
NAME = Teddy
AGE = 23
ADDRESS = Norway
SALARY = 20000.0

ID = 4
NAME = Mark
AGE = 25
ADDRESS = Rich-Mond
SALARY = 65000.0

Operation done successfully
```

DELETE 操作

下面的 Java 代码显示了如何使用 DELETE 语句删除任何记录，然后从 COMPANY 表中获取并显示剩余的记录：

```
import java.sql.*;

public class SQLiteJDBC
{
  public static void main( String args[] )
  {
    Connection c = null;
    Statement stmt = null;
    try {
      Class.forName("org.sqlite.JDBC");
      c = DriverManager.getConnection("jdbc:sqlite:test.db");
      c.setAutoCommit(false);
      System.out.println("Opened database successfully");

      stmt = c.createStatement();
      String sql = "DELETE from COMPANY where ID=2;";
      stmt.executeUpdate(sql);
      c.commit();

      ResultSet rs = stmt.executeQuery( "SELECT * FROM COMPANY;" );
      while ( rs.next() ) {
         int id = rs.getInt("id");
         String  name = rs.getString("name");
         int age  = rs.getInt("age");
         String  address = rs.getString("address");
         float salary = rs.getFloat("salary");
         System.out.println( "ID = " + id );
         System.out.println( "NAME = " + name );
         System.out.println( "AGE = " + age );
         System.out.println( "ADDRESS = " + address );
```

```
            System.out.println( "SALARY = " + salary );
            System.out.println();
         }
         rs.close();
         stmt.close();
         c.close();
       } catch ( Exception e ) {
         System.err.println( e.getClass().getName() + ": " + e.getMessage() );
         System.exit(0);
       }
       System.out.println("Operation done successfully");
     }
   }
```

上述程序编译和执行时，它会产生以下结果：

```
Opened database successfully
ID = 1
NAME = Paul
AGE = 32
ADDRESS = California
SALARY = 25000.0

ID = 3
NAME = Teddy
AGE = 23
ADDRESS = Norway
SALARY = 20000.0

ID = 4
NAME = Mark
AGE = 25
ADDRESS = Rich-Mond
SALARY = 65000.0

Operation done successfully
```

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