

Assignment #4

JDBC

KAIST
Myoung Ho Kim

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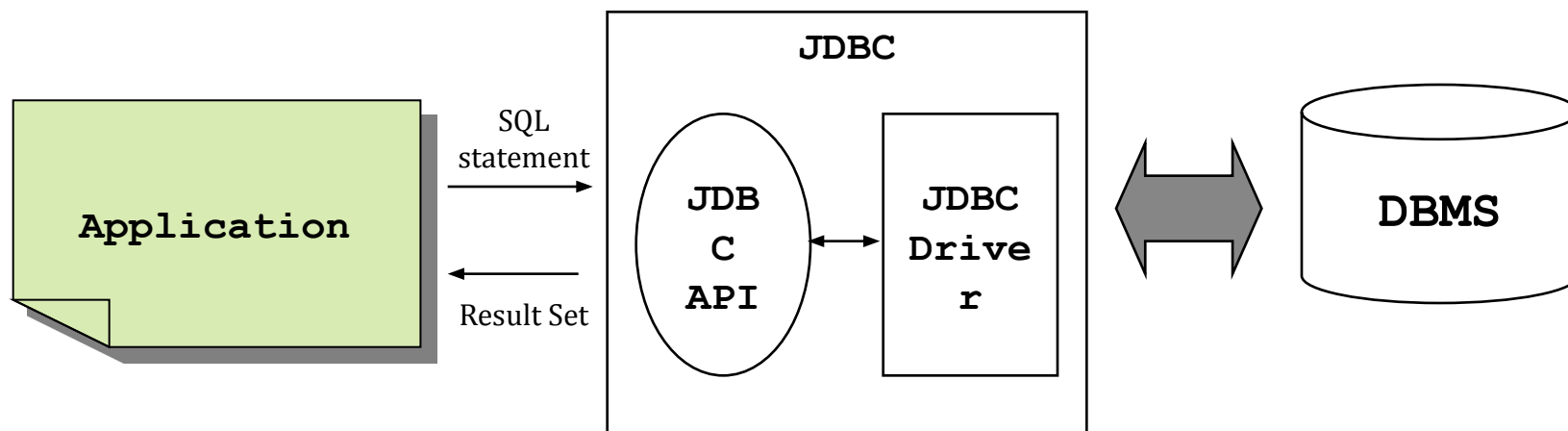


JDBC

1. Introduction to JDBC
2. Example
3. Main classes & method
4. JDBC driver installation

Introduction to JDBC

- What is JDBC?
 - “Java Database Connectivity”
 - Connector to access DB, when developing applications in Java™ Platform



Example of JDBC code

```
import java.sql.*;

class Test {
    public static void main(String[] args) {
        Connection con = null;
        Statement stmt = null;

        try {
            Class.forName("oracle.jdbc.driver.OracleDriver");
            con = DriverManager.getConnection("jdbc:oracle:thin:@dbclick.kaist.ac.kr:1521:orcl", "user", "passwd");
            stmt = con.createStatement();
            ResultSet rs = stmt.executeQuery("select * from product");

            while (rs.next()) {
                String product = rs.getString(1);
                System.out.println(product);
            }
        } catch (Exception e) {
            e.printStackTrace();
        } finally {
            try {
                if (stmt != null) stmt.close();
                if (con != null) con.close();
            } catch (Exception e) {}
        }
    }
}
```

You can download [Test.java](#) from the course homepage

Main classes & method

- Loading JDBC driver
 - Using `Class.forName()`

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

- Connecting to DB
 - Using `DriverManager.getConnection()`

```
Connection con =  
    DriverManager.getConnection("jdbc:oracle:thin:  
        @dbclick.kaist.ac.kr:1521:orcl", "username", "passwd");
```

Main classes & method (cont'd)

- Executing queries
 - Using Statement class

```
Statement stmt = con.createStatement();
ResultSet rs = stmt.executeQuery("SELECT * FROM product");
```

- Using PreparedStatement class

```
PreparedStatement pstmt =
    con.prepareStatement("INSERT INTO product values(?, ?)");
pstmt.setString(1, "mp3");
pstmt.setInt(2, 150);
pstmt.executeUpdate();
```

※ Use `executeUpdate()` for insert, update, and delete

Main classes & method (cont'd)

- Cursor operations
 - Use methods of ResultSet class
 - » Ex) next(), getString(), etc.

```
ResultSet rs = stmt.executeQuery("SELECT * FROM  
product");  
while (rs.next()) {  
    String maker = rs.getString(1);  
    int model = rs.getInt(2);  
    System.out.println(maker+" "+model);  
}
```


Main classes & method (cont'd)

- Using 'finally'
 - Before finishing code, connection should be closed

```
try {
    ...
    con = DriverManager.getConnection( ... );
    stmt = con.createStatement();
    ...
} catch (Exception e) {
    e.printStackTrace();
} finally {
    try {
        if (stmt != null) stmt.close();
        if (con != null) con.close();
    } catch (Exception e) {}
}
```

Main classes & method (cont'd)

- Executing Query within a Transaction

```
try {
    ...
    con = DriverManager.getConnection( ... );
    con.setAutoCommit(false);

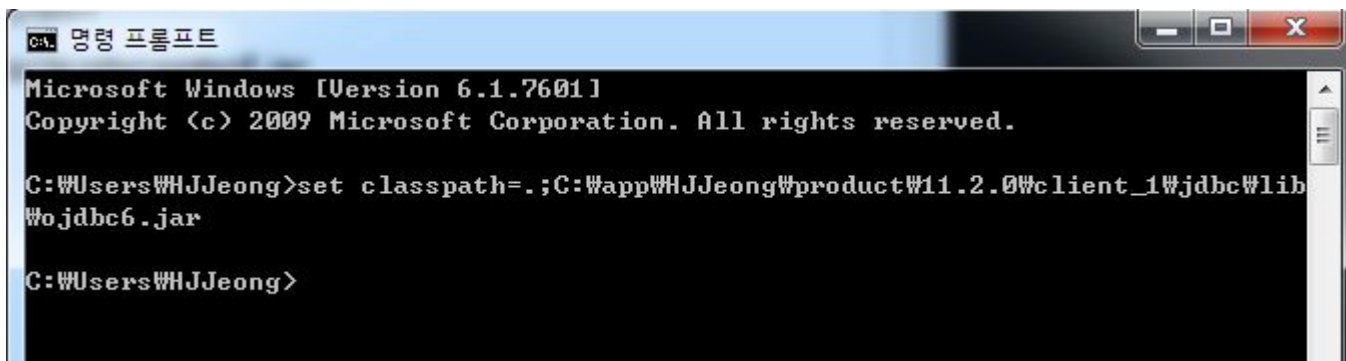
    stmt = con.createStatement();
    stmt.executeQuery( ... );
    stmt.executeQuery( ... );
    ...
    conn.commit();
} catch (SQLException e) {
    conn.rollback();
    ...
}
```

JDBC driver installation

- JAVA SE 7.0 or 8.0 must be installed
 - See references
- Download (ojdbc6.jar)
 - <http://www.oracle.com/technetwork/database/enterprise-edition/jdbc-112010-090769.html>
 - or **from the course homepage (KLMS)**

Compile java using DOS command

- Environment variable setting
 - » If you use the “Eclipse”, you don’t have to do this setting
 - Copy the ojdbc6.jar file to the driver installation path
 - Add(or create) the CLASSPATH environment variable to the driver installation path
 - » Ex) The driver installation path is
ORACLE_HOME\jdbc\lib\ojdbc6.jar



```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\WHJJeong>set classpath=.;C:\wapp\WHJJeong\product\11.2.0\client_1\jdbc\lib\
Wojdbc6.jar

C:\Users\WHJJeong>
```

Compile java using DOS command

(cont'd)

- Example of file execution in the **DOS command(cmd)** window
 - Compiling & running

```
import java.sql.*;

class Test {
    public static void main(String[] args) {
        Connection con = null;

        try {
            Class.forName("oracle.jdbc.driver.OracleDriver");
            con = DriverManager.getConnection("jdbc:oracle:thin:@dbclick.kaist.ac.kr:1521:orcl", "user", "passwd");
            System.out.println("Connection created");
        } catch (Exception e) {
            e.printStackTrace();
        } finally {
            try {
                if (con != null) con.close();
            } catch (Exception e) {}
        }
    }
}
```

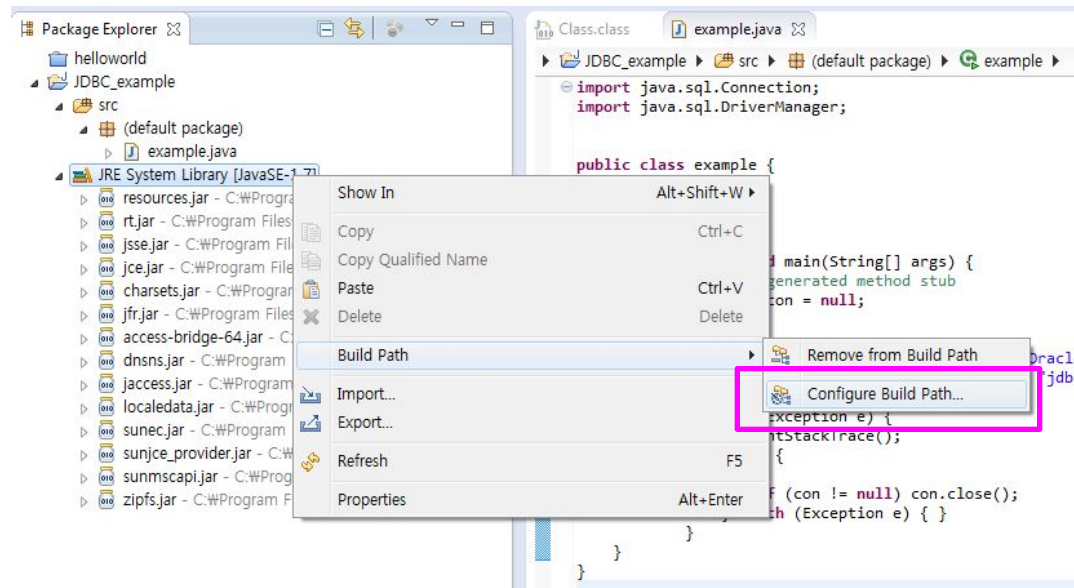
```
D:\WTAW2016_CS360_TA\HW4>javac Test.java
D:\WTAW2016_CS360_TA\HW4>java Test
```

Compile java using Eclipse IDE

- Eclipse setting

1. Add ojdbc6.jar to project build path

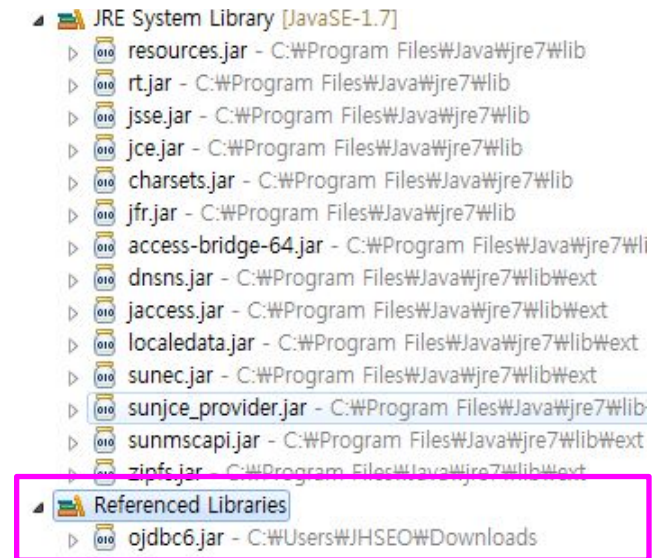
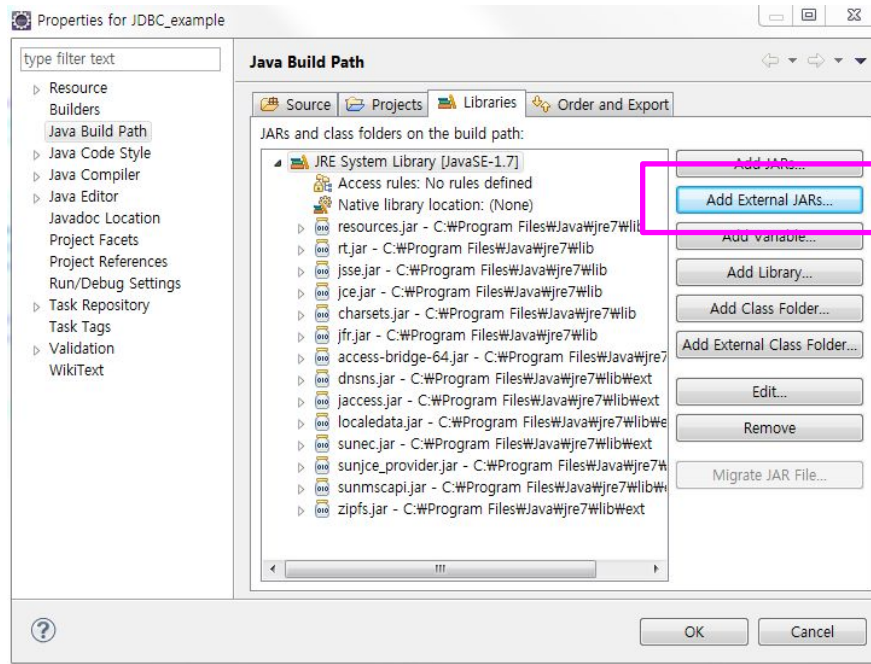
- » Right click on JRE System Library Build Path Configure Build Path



Compile java using Eclipse IDE

(cont'd)

2. Add External IDE select ojdbc6.jar





Homework #4

1. Table Creation
2. Homework Assignment
3. Directions
4. References

Table creation

1. Download *HW4db.sql* from the course homepage and copy it to (directory that Oracle Client is installed)\BIN
2. Use the *SQLPlus* and perform the command *@HW4db.sql* or *start HW4db.sql*

```
SQL> @HW4db.sql  
  
테이블이 삭제되었습니다.  
  
테이블이 삭제되었습니다.
```

Homework #4 (cont'd)

- Problem 1
 - Ask the user for the maximum price and minimum values of the speed, RAM, hard disk, and screen size that they will accept. Find all the laptops that satisfy these requirements. Print their specifications (all attributes of Laptop) and their manufacturer.

Homework #4 (cont'd)

- Problem 2.
 - Ask the user for a manufacturer, model number, speed, RAM, hard-disk size, and price of a new PC. Check that there is no PC with that model number. Print a warning if so, and otherwise insert the information into tables Product and PC. And then print Product and PC tables

Homework #4 (cont'd)

- Problem 3.
 - Ask the user for a price and find the PC whose price is closest to the desired price. Print the maker, model number, and RAM of the PC

Homework #4 (cont'd)

- Problem 4.
 - Ask the user for a manufacturer. Print the specifications of all products by that manufacturer. That is, print the model number, product-type, and all the attributes of whichever relation is appropriate for that type.
 - For example,
 - » Print model, speed, ram, hd, screen and price for laptops
 - » Print model, color, type and price for printers

Homework #4 (cont'd)

- Problem 5.
 - Ask the user for a “budget” (total price of a PC and printer), and a minimum speed of the PC. Find the cheapest “system” (PC plus printer) that is within the budget and minimum speed, but make the printer a color printer if possible. Print the model numbers for the chosen system.

Submission

- **Files to submit**
 - 1. JAVA (*.java)
 - 2. Archive them into [student ID].zip and upload it to course homepage (KLMS)
- **Evaluation**
 - You will get points if your source codes are compiled successfully
 - You will get points if your program find the right answers and is written correctly
 - Do not cheat others. Both of them will get no point

Submission (cont'd)

- **Due date**
 - Oct 19 (Wed), 2 am.
 - Delay is not accepted
- **TA info.**
 - **Hyun Ji Jeong** (email : hjjung@dbserver.kaist.ac.kr)

References

- Related files(Test.java) are uploaded in KLMS
- JAVA Installation
 - (Korean version) <http://blog.naver.com/5suhyeon/220299496827>
 - (English version)
http://docs.oracle.com/javase/8/docs/technotes/guides/install/windows_jdk_install.html#CHDEBCCJ
- JDBC
 - JAVA Platform, Standard Edition 8 API Specification :
<http://docs.oracle.com/javase/8/docs/>
 - documentation : <http://docs.oracle.com/javase/8/docs/technotes/guides/jdbc/index.html>