HONG KONG INSTITUTE OF VOCATIONAL EDUCATION

Lab 3: Servlet Database

Module Intended Learning Outcome (#1):
On completion of the module, students are expected to be able to:

- Creating a Derby Database
- Develop a Servlet applications to read the contents.

Lesson Intended Learning Outcome:
On completion of this workshop, students are expected to be able to:

- Build the Servlet applications to create a Derby Database and display the information with the database.

Task A – DatabaseServlet

Step 1: Create a new project namely, DatabaseServlet_YOURNAME

Step 2: Create a database connection page (index.jsp) with 1 submit button with value “Get Information From Database”.

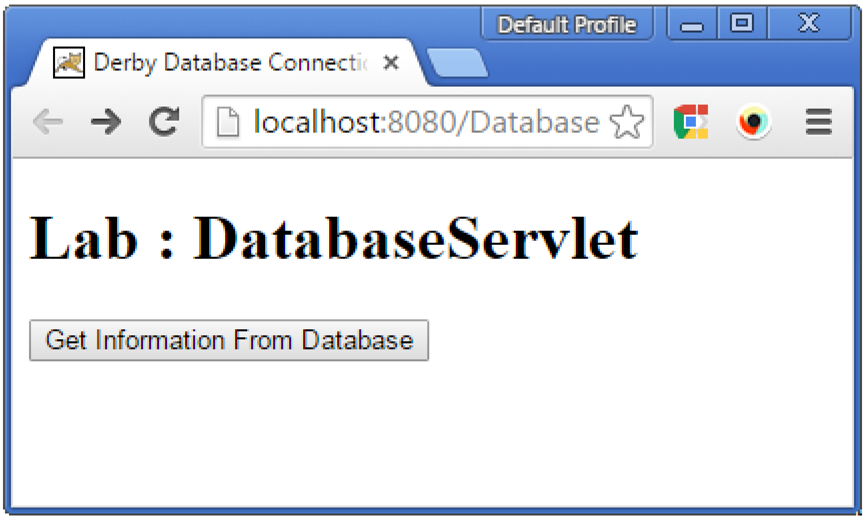


Figure 1. Sample screen of the database connection page

Step 3 : Open the Services Windows by selecting Windows>Service, or by pressing Ctrl-5.

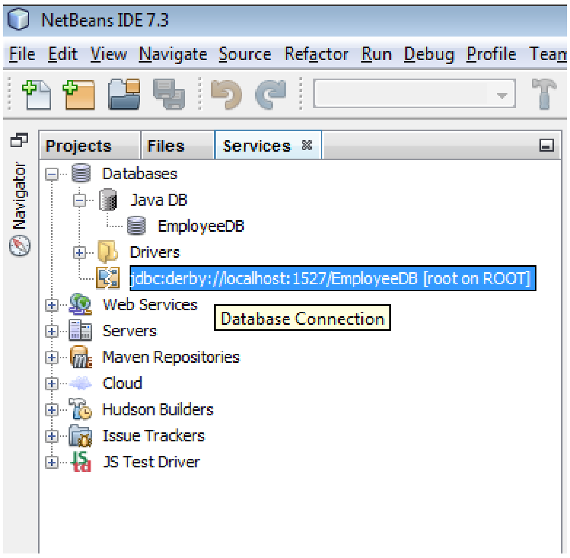


Figure 1: The main Interface of NetBeans

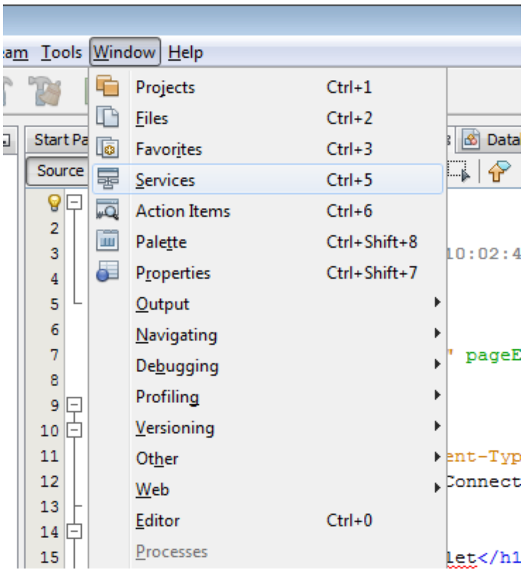


Figure 2: Open Services using Windows◊Services

Step 4 : Right-Click Java DB and select “Start Server”. Right-Click Java DB again and select “Create Database”

Step 5 : Enter the following information :

Window / Page Description	Choices or Values
Database Name	EmployeeDB
User Name	root
Password	root
Confirm Password	root

Step 6 : Right-click the connection that you created:
Jdbc:derby://localhost:1527/EmployeeDB [public on PUBLIC] and select Connect.

Step 7 : Right-click the connection and select “Execute Command”.

Step 8 : Put the following sql statement on the “SQL Command” and Enter “Shift + F6”.

```
DROP TABLE EMPLOYEE;

CREATE TABLE EMPLOYEE (
        ID INTEGER NOT NULL,
        FIRSTNAME VARCHAR(40) NOT NULL,
        LASTNAME VARCHAR(40) NOT NULL,
        BIRTHDATE DATE,
        SALARY REAL,
        PRIMARY KEY (ID)
);

INSERT INTO EMPLOYEE VALUES (110, 'Troy', 'Hammer', '1965-03-31', 102109.15);
INSERT INTO EMPLOYEE VALUES (123, 'Michael', 'Walton', '1986-08-25', 93400.20);
INSERT INTO EMPLOYEE VALUES (201, 'Thomas', 'Fitzpatrick', '1961-09-22', 75123.45);
INSERT INTO EMPLOYEE VALUES (101, 'Abhijit', 'Gopali', '1956-06-01', 89345.00);
INSERT INTO EMPLOYEE VALUES (120, 'Rajiv', 'Sudahari', '1969-12-22', 68400.22);
INSERT INTO EMPLOYEE VALUES (190, 'Patrice', 'Bergeron', '1970-09-18', 109345.00);

INSERT INTO EMPLOYEE VALUES (111, 'Matthieu', 'Williams', '1966-05-31', 100345.15);
INSERT INTO EMPLOYEE VALUES (124, 'Michael', 'McGinn', '1979-01-25', 99400.20);
INSERT INTO EMPLOYEE VALUES (202, 'Thomas', 'Heimer', '1967-07-22', 79123.45);
INSERT INTO EMPLOYEE VALUES (102, 'Peter', 'Forrester', '1965-11-01', 99345.00);
INSERT INTO EMPLOYEE VALUES (121, 'Kenny', 'Arlington', '1959-10-22', 78405.22);
INSERT INTO EMPLOYEE VALUES (191, 'Jill', 'Molinair', '1968-08-18', 119345.00);

INSERT INTO EMPLOYEE VALUES (129, 'Cindy', 'Colchester', '1965-03-24', 902109.15);
INSERT INTO EMPLOYEE VALUES (133, 'Clarence', 'Dupree', '1986-08-11', 103400.20);
INSERT INTO EMPLOYEE VALUES (211, 'Paromita', 'Sumesh', '1961-09-13', 105123.45);
INSERT INTO EMPLOYEE VALUES (151, 'Arfat', 'Poland', '1956-06-11', 99345.00);
INSERT INTO EMPLOYEE VALUES (130, 'David', 'OReilly', '1969-12-25', 88400.22);
INSERT INTO EMPLOYEE VALUES (200, 'Patricia', 'Arnant', '1970-10-31', 79345.00);
```

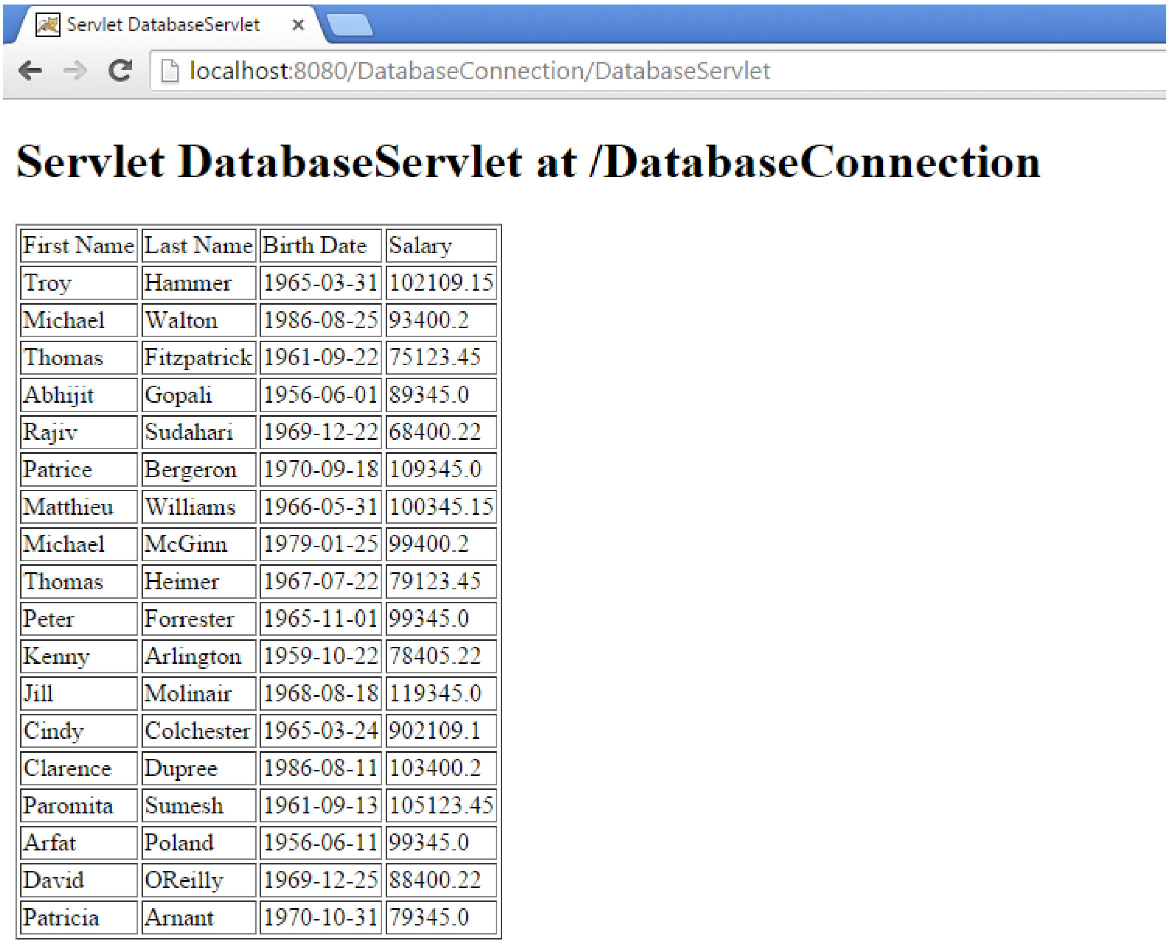
Step 9 : Expand the EmployeeDB connection. You will see that the PUBLIC schema is now created. Expand the PUBLIC Schema, expand Tables, and then expand the table Employee.

Step 10 : Right-click the connection again and select Execute Command to open another SQL window. Enter the command: **Select * from Employee**
Click the Run-SQL icon to see the contents of the Employee table

Step 11: Write the Servlet class, DatabaseServlet.java which selecting employee data from the derby database.
Sample code for your reference:

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;
import java.sql.* ;

public class DatabaseServlet extends HttpServlet {
   protected void doPost(HttpServletRequest request, HttpServletResponse response)
          throws ServletException, IOException {

                String connectionURL = "jdbc:derby://localhost:1527/EmployeeDB";
                response.setContentType("text/html;charset=UTF-8");
                PrintWriter out = response.getWriter();
                 try {
                     Connection conn = DriverManager.getConnection(connectionURL, "root",
"root");
                     String sql = "SELECT * FROM EMPLOYEE";
                     Statement stmt = conn.createStatement();
                     ResultSet rs = stmt.executeQuery(sql);
                     out.println("<html>
                     out.println("<head>");
                     out.println("<title>Servlet DatabaseServlet</title>");
                     out.println("</head>");
                     out.println("<body>");
                     out.println("<h1>Servlet DatabaseServlet at " + request.getContextPath()
                                          + "</h1>");

                     //Display the table format
                     out.println(<table> …

                     while (rs.next())
                     {
                            //Display the database record by using tr, td and rs
                            …
                     }
                     rs.close();
                     stmt.close();
                     conn.close();
                     out.println("</body>");
                     out.println("</html>");
                  } catch(SQLException ex) {
                     System.out.println("Connect failed ! ");
                  }
         }
}
```

The following screen will be displayed :



localhost:8080/DatabaseConnection/DatabaseServlet

Servlet DatabaseServlet at /DatabaseConnection

First Name	Last Name	Birth Date	Salary
Troy	Hammer	1965-03-31	102109.15
Michael	Walton	1986-08-25	93400.2
Thomas	Fitzpatrick	1961-09-22	75123.45
Abhijit	Gopali	1956-06-01	89345.0
Rajiv	Sudahari	1969-12-22	68400.22
Patrice	Bergeron	1970-09-18	109345.0
Matthieu	Williams	1966-05-31	100345.15
Michael	McGinn	1979-01-25	99400.2
Thomas	Heimer	1967-07-22	79123.45
Peter	Forrester	1965-11-01	99345.0
Kenny	Arlington	1959-10-22	78405.22
Jill	Molinair	1968-08-18	119345.0
Cindy	Colchester	1965-03-24	902109.1
Clarence	Dupree	1986-08-11	103400.2
Paromita	Sumesh	1961-09-13	105123.45
Arfat	Poland	1956-06-11	99345.0
David	OReilly	1969-12-25	88400.22
Patricia	Arnant	1970-10-31	79345.0

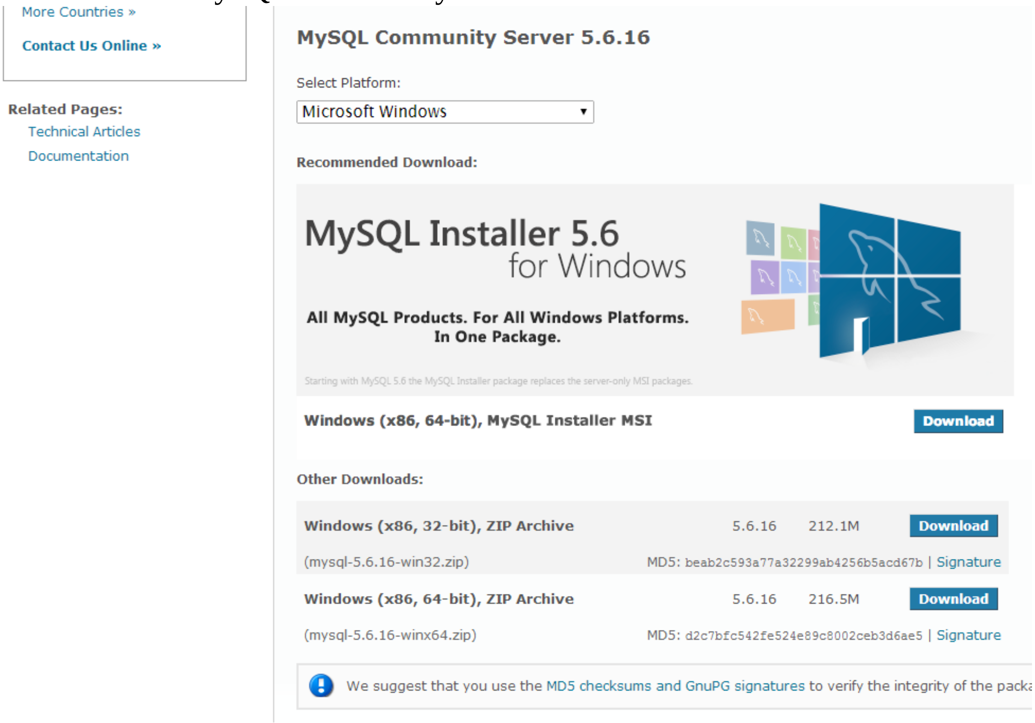
Step 7: Demonstrate your program to the lecturer and submit your zipped project file to Moodle.

Additional materials (Connect with MySQL)

0. Preparing the MySQL database Server for connecting to the NetBeans.

   a. Open the website link http://dev.mysql.com/downloads/mysql/

   b. Download the MySQL Community Server 5.6.16.



MySQL Community Server 5.6.16

Select Platform:

Microsoft Windows

Recommended Download:

All MySQL Products. For All Windows Platforms.
In One Package.

Starting with MySQL 5.6 the MySQL Installer package replaces the server-only MSI packages.

Windows (x86, 64-bit), MySQL Installer MSI

Other Downloads:

Windows (x86, 32-bit), ZIP Archive	5.6.16	212.1M	Download
(mysql-5.6.16-win32.zip)	MD5: beab2c593a77a32299ab4256b5acd67b | Signature		
Windows (x86, 64-bit), ZIP Archive	5.6.16	216.5M	Download
(mysql-5.6.16-winx64.zip)	MD5: d2c7bfc542fe524e89c8002ceb3d6ae5 | Signature		

We suggest that you use the MD5 checksums and GnuPG signatures to verify the integrity of the packa

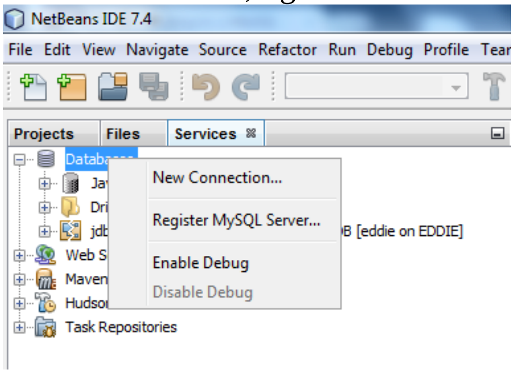
   c. Install the MySQL Community Server and input the following information.

Configuration Description	Values
Server Host Name	localhost
Server Port Number	3306
Administrator User Name	root
Administrator Password	root

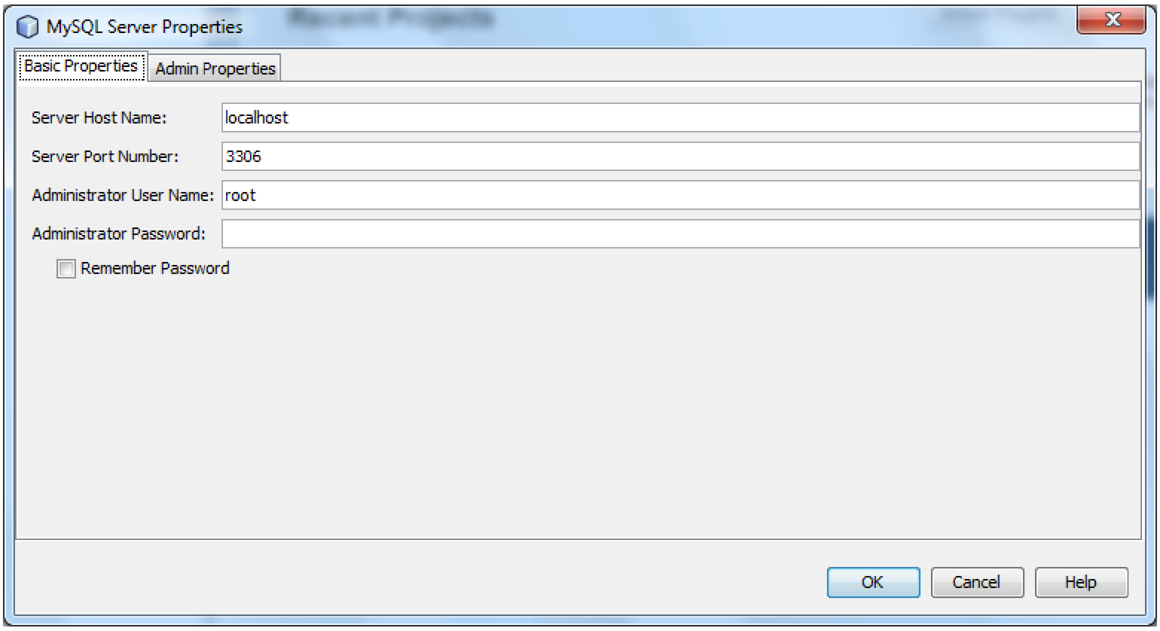
1. Open the NetBeans and open the Tab Services.

2. Configuring MySQL Server Properties

a. From the Database, right-click and click “Register MySQL Server”.



b. Confirm that the Server host name and port are correct. Notice that the IDE enters localhost as the default server host name and 3306 as the default server port number.


MySQL Server Properties

Basic Properties | Admin Properties

Server Host Name: localhost

Server Port Number: 3306

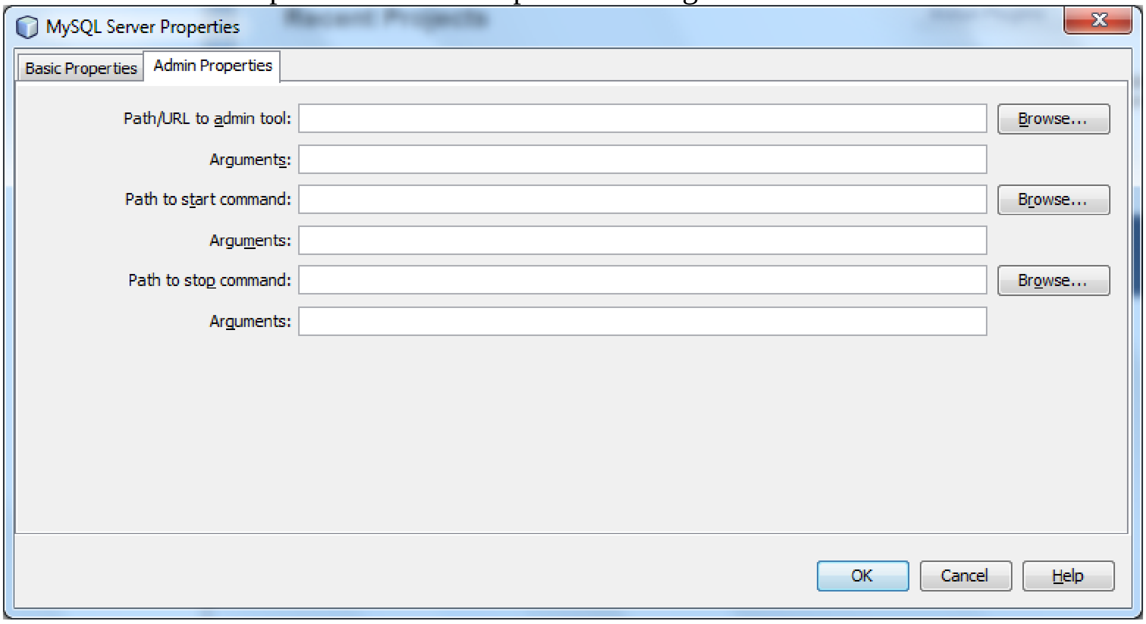
Administrator User Name: root

Administrator Password:

□ Remember Password

c. Enter the Administrator user name “root” and password “root”.

d. Click the Admin Properties tab at the top of the dialog box.

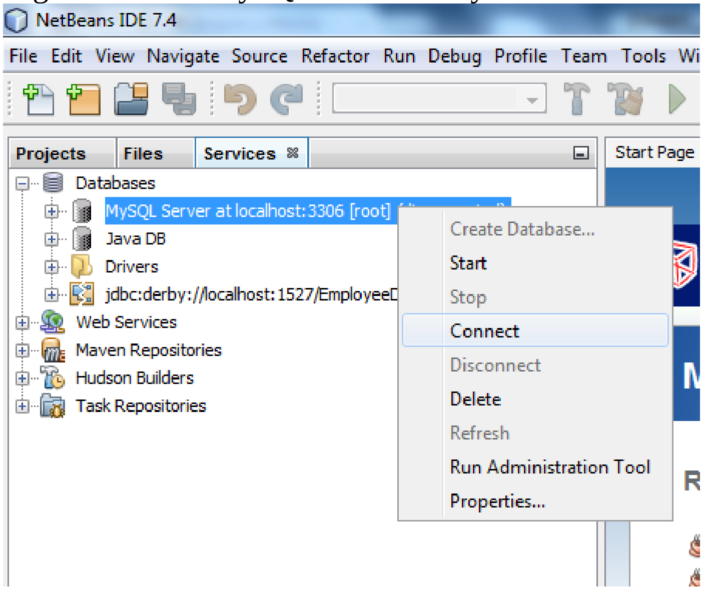


e. Input the following information in the Admin Properties tab and click "OK".

Name	Value
Path/URL to admin tool :	C:\Program Files\MySQL\MySQL Server 5.6\bin\mysqladmin.exe
Path to start command :	C:\Program Files\MySQL\MySQL Server 5.6\bin\mysqld.exe
Path to stop command :	C:\Program Files\MySQL\MySQL Server 5.6\bin\mysqladmin.exe
Arguments	-u root stop

3. Starting the MySQL Server

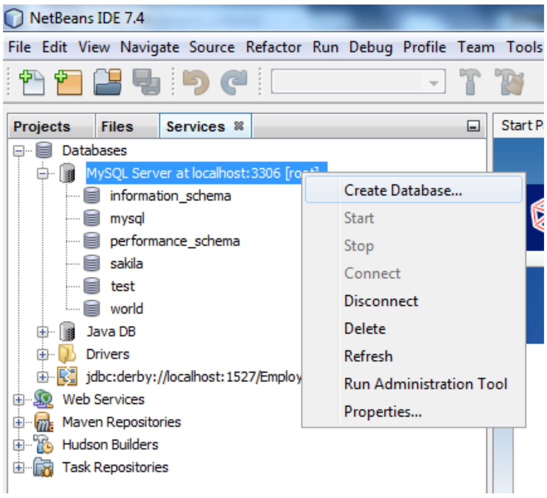
a. Right-Click the MySQL Server that you created and select "Connect".



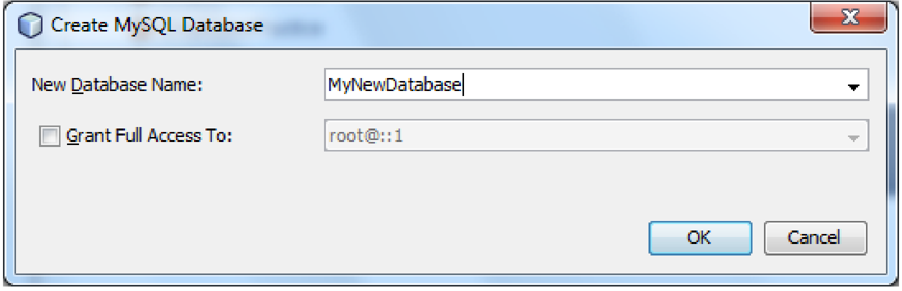
4. Creating and Connecting to the MySQL database instance

   a. In the IDE’s Service Window, right-click the MySQL Server Node.

   b. Choose Create Database :



   c. In the Create MySQL Database dialog box, type the name of the new database. We will use MyNewDatabase for this tutorial. Leave the checkbox.



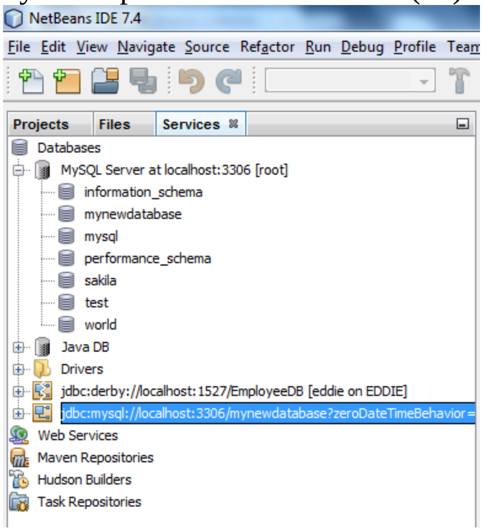
New Database Name: MyNewDatabase

□ Grant Full Access To: root@::1

   d. Click OK.

   e. The new database appears under the MySQL Server node in the Services window.

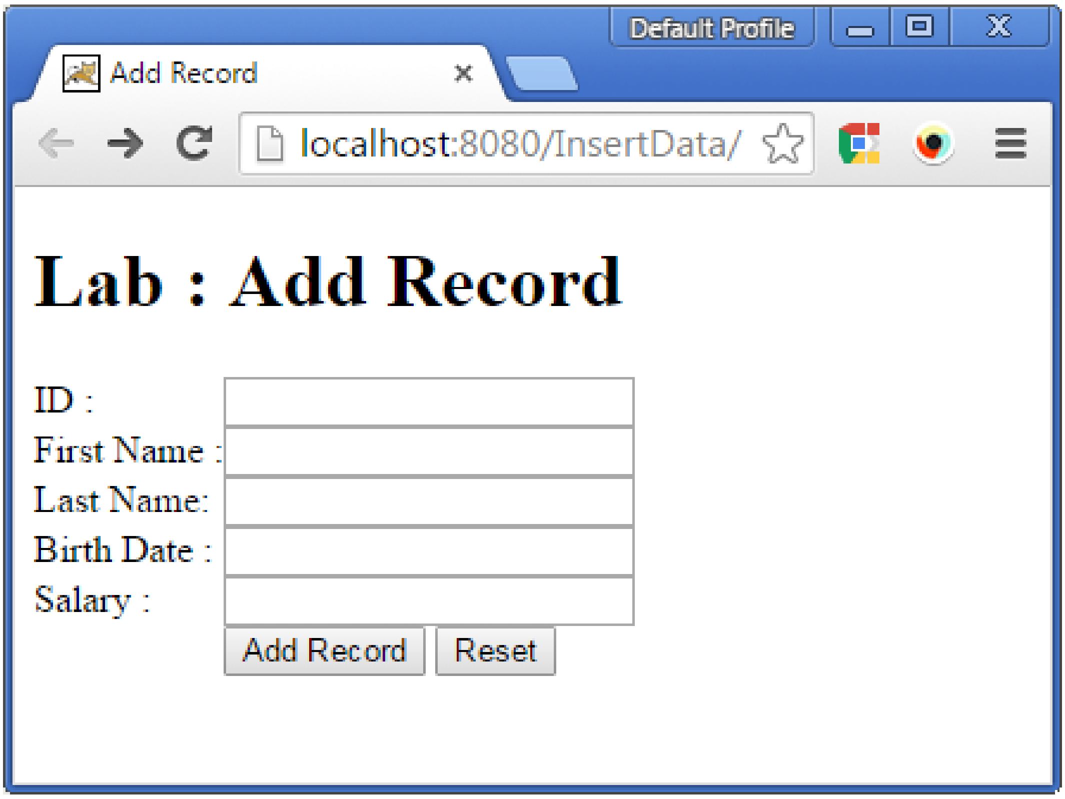
   f. Right-click the new database node and choose Connect in the popup menu to open the connection to the database. Database connections that are open are represented by a complete connection node () in the Services window


NetBeans IDE 7.4
File Edit View Navigate Source Refactor Run Debug Profile Team
Projects Files Services
Databases
MySQL Server at localhost:3306 [root]
information_schema
mynewdatabase
mysql
performance_schema
sakila
test
world
Java DB
Drivers
jdbc:derby://localhost:1527/EmployeeDB [eddie on EDDIE]
jdbc:mysql://localhost:3306/mynewdatabase?zeroDateTimeBehavior=
Web Services
Maven Repositories
Hudson Builders
Task Repositories

Task B – InsertData

Step 1: Create a Java Web Application Project with the name InsertData.

Step 2 : Design a web page with a form to input the user's "first name", "last name", "number of working years", and "monthly salary". The form will use the http post method to pass the data the server.



Lab : Add Record

ID :	
First Name :	
Last Name:	
Birth Date :	
Salary :	
	Add Record Reset

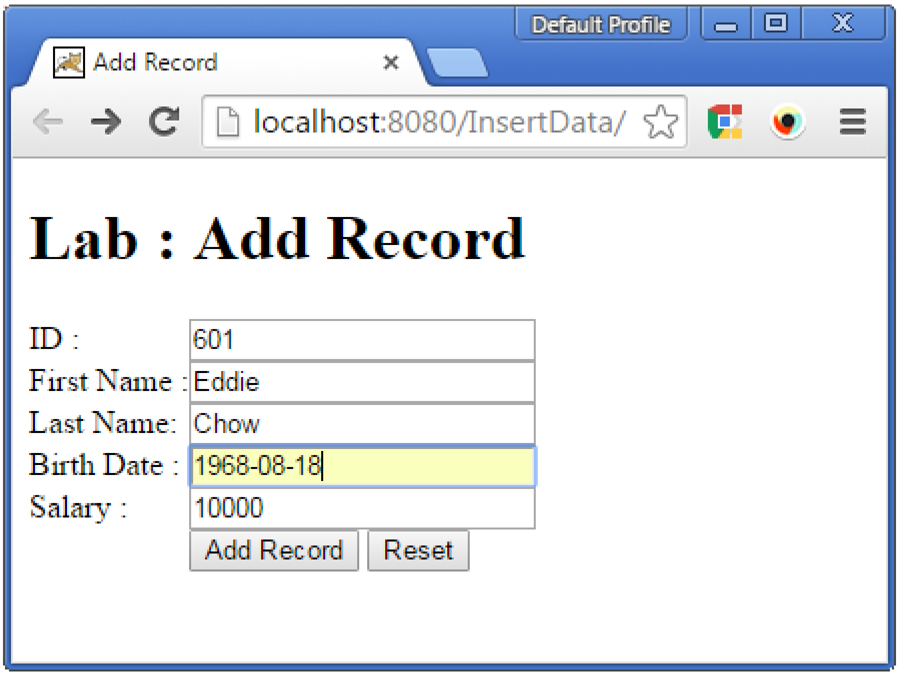
Step 3 : Create and Write the Servlet class, InsertData.java which add the employee data (ID, firstname, lastname, birthdate, salary) to the derby database.

Sample Code for your reference :

```
protected void doPost(HttpServletRequest request, HttpServletResponse response)
          throws ServletException, IOException {
                response.setContentType("text/html");
               PrintWriter pw = response.getWriter();
               String connectionURL = "jdbc:derby://localhost:1527/EmployeeDB";//
               Connection connection;
              try{
                    String id = request.getParameter("id");
                    // Declare the variable (firstname, lastname, birthdate, salary) to get the value from
the client side
                    …
                    connection = DriverManager.getConnection(connectionURL, "root", "root");
                    PreparedStatement pst = connection.prepareStatement
                            ("insert into EMPLOYEE(ID, FIRSTNAME,LASTNAME, BIRTHDATE,
SALARY) "  + "values(?,?,?,?,?)");
```

```
                // Assign the value and store in the PreparedStatement
                Pst.setString(1, id);
                …

                int i = pst.executeUpdate();
                if(i!=0){
                        pw.println("<br>Record has been inserted");
                }
                else{
                        pw.println("failed to insert the data");
                }
            }
            catch (Exception e){
                pw.println(e);
    }
```

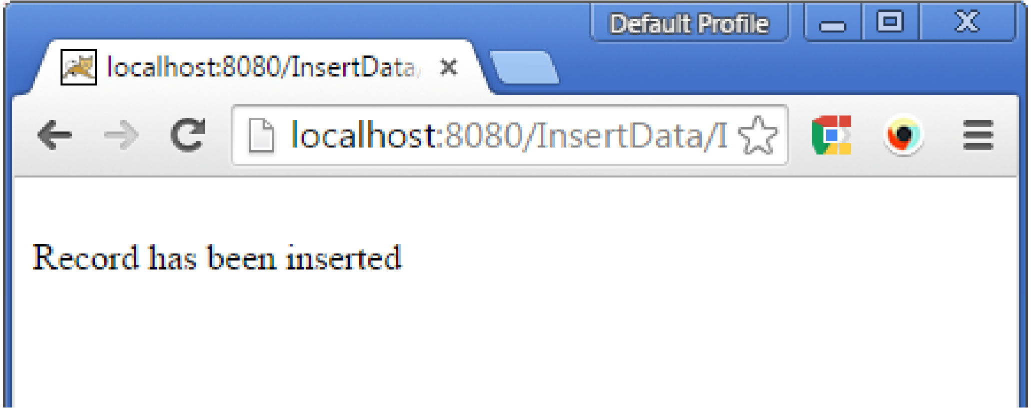
Step 4 : After inputting the following data :



Lab : Add Record

ID :	601
First Name :	Eddie
Last Name:	Chow
Birth Date :	1968-08-18
Salary :	10000

The following screen will be displayed :



Record has been inserted