Course: Web Application Development
Lab 4 - Database Connection

Content:

- How to connect to Database Server
- Practices and Exercises

Part 1: Database Management System (MySQL)

To install MySQL and MySQL Workbench, please refer to Lab 01
(file: WAD_Lab01_Basic_HTML.pdf)

You can also find the user manual of MySQL Workbench at
https://dev.mysql.com/doc/workbench/en/

To review SQL you can visit https://www.w3schools.com/sql/

**Note: MySQL Workbench is optional, you can use your system's command prompt or terminal to create a database for your website.

Example:
- Create a database for courses registration
- Create the following tables in your new database

```
-- --------------------------------------------------------

--
-- Table structure for table 'course'
--

CREATE TABLE IF NOT EXISTS course (
  _ID int(10) NOT NULL auto_increment,
  CourseName varchar(255) NOT NULL,
  Credits int(1) NOT NULL,
  PRIMARY KEY  (_ID),
  KEY Course_CourseID_INDEX (CourseName)
) ENGINE=InnoDB  DEFAULT CHARSET=utf8 AUTO_INCREMENT=5 ;

-- --------------------------------------------------------

--
-- Table structure for table 'student'
--
CREATE TABLE IF NOT EXISTS student (
  _ID int(10) NOT NULL auto_increment,
  StudentID varchar(10) NOT NULL,
  StudentName varchar(255) NOT NULL,
  PRIMARY KEY  (_ID)
) ENGINE=InnoDB  DEFAULT CHARSET=utf8 AUTO_INCREMENT=6 ;
-- --------------------------------------------------------

--
-- Table structure for table 'studentcourse'
--

CREATE TABLE IF NOT EXISTS studentcourse (
  Student_ID int(10) NOT NULL,
```

```
  Course_ID int(10) NOT NULL,
  PRIMARY KEY  (Student_ID,Course_ID),
  KEY StudentCourse_StudentID_INDEX (Student_ID),
  KEY StudentCourse_CourseID_INDEX (Course_ID)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

- Use file <course.csv> to import records to your database (you can either copy/paste, write java code or sql query).
- Create one or more records for student table.

Part 2: Connection JSP - MySQL

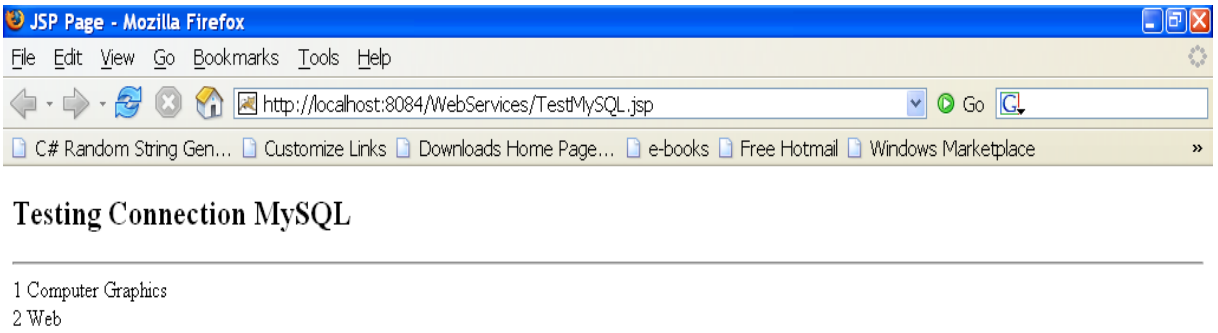
****Note: You have to include/import a suitable version of mysql-connector-java-*.jar with your MySQL version.***
Seven steps to connect JSP-DBMS by using JDBC:

- Load driver
- Define a connection URL
- Establish a connection
- Create a statement object
- Execute a query
- Process the results
- Close the connection

Use the following source below to test your system

```
<%
        String connectionURL="jdbc:mysql://localhost:3306/your database name"; //step 2
        Connection connection = null;
        Statement statement = null;
        ResultSet rs = null;
%>
-----------------------------------------------------------
<%
         Class.forName("com.mysql.jdbc.Driver");    //step 1
                  connection = DriverManager.getConnection(connectionURL, "your database username", "your database password"); //step 3
         statement = connection.createStatement(); //step 4
         rs = statement.executeQuery("SELECT * FROM course");  //step 5

       while (rs.next()) {
            out.println(rs.getString("CourseName"));
            out.println(rs.getString("Credits")+"<br>");
         }        //step 6
         rs.close();       //step 7
%>
```



Now go on to develop your project based on part 3

Part 3: Java Server Pages

Using what you have learned in previous labs to create several jsp files:

- **login.jsp**: provide login form and check username and password for authentication. If user input valid username and password, he/she will go to homepage.jsp.

** Note: Use StudentID column in student table to validate username and password.

- **homepage.jsp:** display your username and registered courses. There should be a button or link to add/update registered course;
- **register.jsp:** allow user to register courses by providing a list of available courses and check-box for selection.