



LẬP TRÌNH WEB (WEBPR330479)

# Hướng dẫn CRUD với Servlet JDBC

THS. NGUYỄN HỮU TRUNG

# Ví dụ: CRUD cho Category Table

2

- Bước 1: Tạo Database: ServletCRUDMVC, Tạo cấu trúc bảng

```
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE Category(
[cate_id] [int] IDENTITY(1,1) NOT NULL,
[cate_name] [nvarchar](255) NOT NULL,
[icons] [nvarchar](255) NULL,
PRIMARY KEY CLUSTERED
(
[cate_id] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF,
IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON,
ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
GO
```

# Ví dụ: CRUD cho Category Table

3

- Bước 2: Tạo Maven Project và cấu hình dependency trong file pom.xml

`<!-- Servlet JEE -->`

`<dependency>`

`<groupId>javax.servlet</groupId>`

`<artifactId>javax.servlet-api</artifactId>`

`<version>3.1.0</version>`

`<scope>provided</scope>`

`</dependency>`

`<dependency>`

`<groupId>javax.servlet.jsp</groupId>`

`<artifactId>javax.servlet.jsp-api</artifactId>`

`<version>2.3.1</version>`

`<scope>provided</scope>`

`</dependency>`

`<dependency>`

`<groupId>jstl</groupId>`

`<artifactId>jstl</artifactId>`

`<version>1.2</version>`

`</dependency>`

# Ví dụ: CRUD cho Category Table

4

- Bước 2: Tạo Maven Project và cấu hình dependency trong file pom.xml

```
<!-- Servlet Jakarta -->
<dependency>
<groupId>javax.servlet</groupId>
<artifactId>javax.servlet-api</artifactId>
<version>3.1.0</version>
<scope>provided</scope>
</dependency>
<dependency>
<groupId>javax.servlet.jsp</groupId>
<artifactId>javax.servlet.jsp-api</artifactId>
<version>2.3.1</version>
<scope>provided</scope>
</dependency>
<dependency>
<groupId>jstl</groupId>
<artifactId>jstl</artifactId>
<version>1.2</version>
</dependency>
```

# Ví dụ: CRUD cho Category Table

5

- Bước 2: Tạo Maven Project và cấu hình dependency trong file pom.xml

```
<!-- Thư viện MySQL JDBC driver -->
<dependency>
  <groupId>mysql</groupId>
  <artifactId>mysql-connector-java</artifactId>
  <version>8.0.13</version>
</dependency>
<!-- Thư viện SQL server JDBC driver -->
<dependency>
<groupId>com.microsoft.sqlserver</groupId>
<artifactId>mssql-jdbc</artifactId>
<version>9.4.0.jre8</version>
</dependency>

<dependency>
<groupId>commons-fileupload</groupId>
<artifactId>commons-fileupload</artifactId>
<version>1.4</version>
</dependency>
```

# Ví dụ: CRUD cho Category Table

6

- Bước 2: Tạo Maven Project và cấu hình dependency trong file pom.xml

```
<build>
<plugins>
<plugin>
<artifactId>maven-war-plugin</artifactId>
<version>3.3.2</version>
</plugin>
<plugin>
<groupId>org.apache.maven.plugins</groupId>
<artifactId>maven-compiler-plugin</artifactId>
<version>3.8.1</version>
<configuration>
<source>17</source>
<target>17</target>
</configuration>
</plugin>
</plugins>
</build>
```

## □ Bước 3: Cấu hình web.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app version="3.0" xmlns="http://JAVA.sun.com/xml/ns/javaee"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd">
<display-name>Shopping Servlet Service MVC</display-name>
  <welcome-file-list>
    <welcome-file>index.jsp</welcome-file>
  </welcome-file-list>
<session-config>
<tracking-mode>COOKIE</tracking-mode>
</session-config>
</web-app>
```

## □ Bước 4: Cấu hình Datasource

```
public class DBConnection {
    public Connection getConnection() throws Exception {
        String url = "jdbc:sqlserver://" + serverName + ":" + portNumber + "\\\" + instance
        + ";databaseName=" + dbName;
        if(instance == null || instance.trim().isEmpty())
            url = "jdbc:sqlserver://" + serverName + ":" + portNumber
            + ";databaseName=" + dbName;
        Class.forName("com.microsoft.sqlserver.jdbc.SQLServerDriver");
        return DriverManager.getConnection(url, userID, password);
    }
    private final String serverName = "localhost";
    private final String dbName = "ShoppingServiceMVC";
    private final String portNumber = "1433";
    private final String instance = ""; // MSSQLSERVER LEAVE THIS ONE EMPTY IF YOUR SQL
    IS A SINGLE INSTANCE
    private final String userID = "sa";
    private final String password = "1234@a$";
}
```



## □ Bước 5: Tạo Class Model: Category.java

```
package vn.iotstar.model;

public class Category {

    private int cateid;
    private String catename;
    private String icon;

    //Tạo constructor, getters/setters
}
```

## □ Bước 6: Tạo Interface DAO: CategoryDAO.java

```
package vn.iotstar.dao;  
import java.util.List;  
import vn.iotstar.model.Category;  
public interface CategoryDao {  
    void insert(Category category);  
    void edit(Category category);  
    void delete(int id);  
    Category get(int id);  
    Category get(String name);  
    List<Category> getAll();  
    List<Category> search(String keyword);  
}
```

## □ Bước 7: Tạo Class DAOImpl: CategoryDAOImpl.java

```
package vn.iotstar.dao.impl;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.util.ArrayList;
import java.util.List;

import vn.iotstar.dao.CategoryDao;
import vn.iotstar.connection.DBConnection;
import vn.iotstar.model.Category;

public class CategoryDaoImpl extends DBConnection implements CategoryDao
{
```

## □ Bước 7: Tạo Class DAOImpl: CategoryDAOImpl.java

```
@Override
public void insert(Category category) {
    String sql = "INSERT INTO category(cate_name,icons) VALUES (?,?)";

    try {
        Connection con = super.getConnection();
        PreparedStatement ps = con.prepareStatement(sql);
        ps.setString(1, category.getName());
        ps.setString(2, category.getIcon());
        ps.executeUpdate();
    } catch (Exception e) {
        e.printStackTrace();
    }
}
```

## □ Bước 7: Tạo Class DAOImpl: CategoryDAOImpl.java

```
@Override
public void edit(Category category) {
    String sql = "UPDATE category SET cate_name = ?, icons=? WHERE cate_id = ?";

    try {
        Connection con = super.getConnection();
        PreparedStatement ps = con.prepareStatement(sql);
        ps.setString(1, category.getName());
        ps.setString(2, category.getIcon());
        ps.setInt(3, category.getId());
        ps.executeUpdate();
    } catch (Exception e) {
        // TODO Auto-generated catch block
        e.printStackTrace();
    }
}
```

## □ Bước 7: Tạo Class DAOImpl: CategoryDAOImpl.java

```
@Override
```

```
public void delete(int id) {
```

```
String sql = "DELETE FROM category WHERE cate_id = ?";
```

```
try {
```

```
Connection con = super.getConnection();
```

```
PreparedStatement ps = con.prepareStatement(sql);
```

```
ps.setInt(1, id);
```

```
ps.executeUpdate();
```

```
} catch (Exception e) {
```

```
e.printStackTrace();
```

```
}
```

```
}
```

## □ Bước 7: Tạo Class DAOImpl: CategoryDAOImpl.java

@Override

```
public Category get(int id) {  
    String sql = "SELECT * FROM category WHERE cate_id = ? ";  
    try {  
        Connection con = super.getConnection();  
        PreparedStatement ps = con.prepareStatement(sql);  
        ps.setInt(1, id);  
        ResultSet rs = ps.executeQuery();  
        while (rs.next()) {  
            Category category = new Category();  
            category.setId(rs.getInt("cate_id"));  
            category.setName(rs.getString("cate_name"));  
            category.setIcon(rs.getString("icons"));  
            return category;  
        } catch (Exception e) {  
            e.printStackTrace();  
        }  
        return null;  
    }  
}
```

## □ Bước 7: Tạo Class DAOImpl: CategoryDAOImpl.java

@Override

```
public List<Category> getAll() {  
    List<Category> categories = new ArrayList<Category>();  
    String sql = "SELECT * FROM Category";  
    try {  
        Connection conn = super.getConnection();  
        PreparedStatement ps = conn.prepareStatement(sql);  
  
        ResultSet rs = ps.executeQuery();  
        while (rs.next()) {  
            Category category = new Category();  
            category.setId(rs.getInt("cate_id"));  
            category.setName(rs.getString("cate_name"));  
            category.setIcon(rs.getString("icons"));  
            categories.add(category);  
        } catch (Exception e) {  
            e.printStackTrace();  
        }  
        return categories;  
    }  
}
```



## □ Bước 8: Tạo interface Service: CategoryService.java

```
package vn.iotstar.service;
import java.util.List;
import vn.iotstar.model.Category;
public interface CategoryService {
    void insert(Category category);
    void edit(Category category);
    void delete(int id);
    Category get(int id);
    Category get(String name);
    List<Category> getAll();
    List<Category> search(String keyword);
}
```

## □ Bước 8: Tạo class Service: CategoryServiceImpl.java

```
package vn.iotstar.service.impl;
import java.util.List;
import vn.iotstar.dao.CategoryDao;
import vn.iotstar.dao.impl.CategoryDaoImpl;
import vn.iotstar.model.Category;
import vn.iotstar.service.CategoryService;
public class CategoryServiceImpl implements CategoryService {
    CategoryDao categoryDao = new CategoryDaoImpl();

    @Override
    public void insert(Category category) {
        categoryDao.insert(category);
    }

    @Override
    public void edit(Category newCategory) {
        Category oldCate = categoryDao.get(newCategory.getId());
        oldCate.setName(newCategory.getName());
        categoryDao.edit(oldCate);
    }
}
```

## ❑ Bước 8: Tạo class Service: CategoryServiceImpl.java

```
package vn.iotstar.service.impl;
import java.io.File;
import java.util.List;
import vn.iotstar.dao.CategoryDao;
import vn.iotstar.dao.impl.CategoryDaoImpl;
import vn.iotstar.model.Category;
import vn.iotstar.service.CategoryService;
public class CategoryServiceImpl implements CategoryService {
    CategoryDao categoryDao = new CategoryDaoImpl();

    @Override
    public void insert(Category category) {
        categoryDao.insert(category);
    }

    @Override
    public void delete(int id) {
        categoryDao.delete(id);
    }

    @Override
    public Category get(int id) {
        return categoryDao.get(id);
    }
}
```

## □ Bước 8: Tạo class Service: CategoryServiceImpl.java

@Override

```
public void edit(Category newCategory) {  
    Category oldCategory = categoryDao.get(newCategory.getId());  
    oldCategory.setName(newCategory.getName());  
    if (newCategory.getIcon() != null) {  
        // XOA ANH CU DI  
        String fileName = oldCategory.getIcon();  
        final String dir = "E:\\upload";  
        File file = new File(dir + "/category" + fileName);  
        if (file.exists()) {  
            file.delete();  
        }  
        oldCategory.setIcon(newCategory.getIcon());  
    }  
    categoryDao.edit(oldCategory);  
}
```

- Bước 8: Tạo classs Service: CategoryServiceImpl.java

```
@Override
public Category get(String name) {
    return categoryDao.get(name);
}

@Override
public List<Category> getAll() {
    return categoryDao.getAll();
}

@Override
public List<Category> search(String catename) {
    return categoryDao.search(catename);
}
```

## □ Bước 9: Tạo Class Controller: CategoryController.java

```
@WebServlet(urlPatterns = { "/admin/category/list" })  
public class CategoryeListController extends HttpServlet {  
    CategoryService cateService = new CategoryServiceImpl();  
  
    @Override  
    protected void doGet(HttpServletRequest req, HttpServletResponse resp) throws  
        ServletException, IOException {  
        List<Category> cateList = cateService.getAll();  
        req.setAttribute("cateList", cateList);  
        RequestDispatcher dispatcher = req.getRequestDispatcher("/views/admin/list-  
category.jsp");  
        dispatcher.forward(req, resp);  
    }  
}
```

## □ Bước 9: Tạo Class Controller: CategoryEditController.java

```
@WebServlet(urlPatterns = { "/admin/category/edit" })
public class CategoryEditController extends HttpServlet {
    CategoryService cateService = new CategoryServiceImpl();
    @Override
    protected void doGet(HttpServletRequest req, HttpServletResponse resp) throws
    ServletException, IOException {
        String id = req.getParameter("id");
        Category category = cateService.get(Integer.parseInt(id));
        req.setAttribute("category", category);
        RequestDispatcher dispatcher = req.getRequestDispatcher("/views/admin/edit-
        category.jsp");
        dispatcher.forward(req, resp);
    }
}
```

## □ Bước 9: Tạo Class Controller: CategoryEditController.java

```
@Override
```

```
protected void doPost(HttpServletRequest req, HttpServletResponse resp)  
throws ServletException, IOException {  
    Category category = new Category();  
    DiskFileItemFactory diskFileItemFactory = new DiskFileItemFactory();  
    ServletFileUpload servletFileUpload = new  
    ServletFileUpload(diskFileItemFactory);  
    servletFileUpload.setHeaderEncoding("UTF-8");  
    try {  
        resp.setContentType("text/html");  
        resp.setCharacterEncoding("UTF-8");  
        req.setCharacterEncoding("UTF-8");  
        List<FileItem> items = servletFileUpload.parseRequest(req);  
        for (FileItem item : items) {
```



## □ Bước 9: Tạo Class Controller: CategoryEditController.java

```
if (item.getFieldName().equals("id")) {
    category.setId(Integer.parseInt(item.getString()));
} else if (item.getFieldName().equals("name")) {
    category.setName(item.getString("UTF-8"));
} else if (item.getFieldName().equals("icon")) {
    if (item.getSize() > 0) {// neu co file d}
    String originalFileName = item.getName();
    int index = originalFileName.lastIndexOf(".");
    String ext = originalFileName.substring(index + 1);
    String fileName = System.currentTimeMillis() + "." + ext;
    File file = new File(Constant.DIR + "/category/" + fileName);
    item.write(file);
    category.setIcon("category/" + fileName);
} else {
    category.setIcon(null);
}
cateService.edit(category);
resp.sendRedirect(req.getContextPath() + "/admin/category/list");
} catch (FileUploadException e) {
    e.printStackTrace();
} catch (Exception e) {e.printStackTrace();}
}
```

## □ Bước 9: Tạo Class Controller: CategoryAddController.java

```
@WebServlet(urlPatterns = { "/admin/category/add" })  
public class CategoryAddController extends HttpServlet {  
    CategoryService cateService = new CategoryServiceImpl();  
    @Override  
    protected void doGet(HttpServletRequest req, HttpServletResponse resp)  
    throws ServletException, IOException {  
        RequestDispatcher dispatcher =  
        req.getRequestDispatcher("/views/admin/add-category.jsp");  
        dispatcher.forward(req, resp);  
    }  
}
```

## □ Bước 9: Tạo Class Controller: CategoryAddController.java

@Override

```
protected void doPost(HttpServletRequest req, HttpServletResponse resp)
throws ServletException, IOException {
    Category category = new Category();
    DiskFileItemFactory diskFileItemFactory = new DiskFileItemFactory();
    ServletFileUpload servletFileUpload = new
    ServletFileUpload(diskFileItemFactory);
    servletFileUpload.setHeaderEncoding("UTF-8");
    try {
        resp.setContentType("text/html");
        resp.setCharacterEncoding("UTF-8");
        req.setCharacterEncoding("UTF-8");
        List<FileItem> items = servletFileUpload.parseRequest(req);
        for (FileItem item : items) {
            if (item.getFieldName().equals("name")) {
                category.setName(item.getString("UTF-8"));
            }
        }
    }
}
```

## □ Bước 9: Tạo Class Controller: CategoryAddController.java

```
} else if (item.getFieldName().equals("icon")) {  
    String originalFileName = item.getName();  
    int index = originalFileName.lastIndexOf(".");  
    String ext = originalFileName.substring(index + 1);  
    String fileName = System.currentTimeMillis() + "." + ext;  
    File file = new File(Constant.DIR + "/category/" + fileName);  
    item.write(file);  
    category.setIcon("/category/" + fileName);  
}  
}  
cateService.insert(category);  
resp.sendRedirect(req.getContextPath() + "/admin/category/list");  
} catch (FileNotFoundException e) {  
    e.printStackTrace();  
} catch (Exception e) {  
    e.printStackTrace();  
}  
}
```

## □ Bước 9: Tạo Class Controller: CategoryDeleteController.java

```
@WebServlet(urlPatterns = { "/admin/category/delete" })
public class CategoryDeleteController extends HttpServlet {
    CategoryService cateService = new CategoryServiceImpl();

    @Override
    protected void doGet(HttpServletRequest req, HttpServletResponse resp)
        throws ServletException, IOException {
        String id = req.getParameter("id");
        cateService.delete(Integer.parseInt(id));
        resp.sendRedirect(req.getContextPath() + "/admin/category/list");
    }
}
```

## □ Bước 10: Chỉnh lại trang list-category.jsp

```
<c:forEach items="${cateList}" var="cate" varStatus="STT" >
<tr class="odd gradeX">
<td>${STT.index+1 }</td>
<c:url value="/image?fname=${cate.icon}" var="imgUrl"></c:url>
<td></td>
<td>${cate.name }</td>
<td><a href="<c:url value='/admin/category/edit?id=${cate.id }' />"
class="center">Sửa</a>
| <a href="<c:url value='/admin/category/delete?id=${cate.id }' />"
class="center">Xóa</a></td>
</tr>
</c:forEach>
```

## □ Bước 10: Chỉnh lại trang add-category.jsp

```
<form role="form" action="add" method="post"
enctype="multipart/form-data">
<div class="form-group">
<label>Tên danh mục:</label> <input class="form-control"
placeholder="please enter category Name" name="name" />
</div>

<div class="form-group">
<label>Ảnh đại diện</label> <input type="file" name="icon" />
</div>
<button type="submit" class="btn btn-default">Thêm</button>
<button type="reset" class="btn btn-primary">Hủy</button>
</form>
```

## □ Bước 11: Chỉnh lại trang edit-Category.jsp

```
<c:url value="/admin/category/edit" var="edit"></c:url>
<form role="form" action="${edit}" method="post"
  enctype="multipart/form-data">
  <input name="id" value="${category.id}" hidden="">
  <div class="form-group">
    <label>Tên danh sách:</label> <input type="text" class="form-control"
    value="${category.name}" name="name" />
  </div>
  <div class="form-group">
    <c:url value="/image?fname=${category.icon}" var="imgUrl"></c:url>
    
    <label>Ảnh đại diện</label> <input type="file" name="icon" value="${category.icon}" />
  </div>
  <button type="submit" class="btn btn-default">Edit</button>
  <button type="reset" class="btn btn-primary">Reset</button>
</form>
```



# Class constant: khai báo các hằng số

33

```
package vn.iotstar.util;  
  
public class Constant {  
    public static final String DIR = "E:\\upload";  
  
}  
  
}
```

```
@SuppressWarnings("serial")
@WebServlet(urlPatterns = "/image") // ?fname=abc.png
public class DownloadImageController extends HttpServlet {

    @Override
    protected void doGet(HttpServletRequest req, HttpServletResponse resp)
        throws ServletException, IOException {
        String fileName = req.getParameter("fname");
        File file = new File(Constant.DIR + "/" + fileName);

        resp.setContentType("image/jpeg");

        if (file.exists()) {
            IOUtils.copy(new FileInputStream(file), resp.getOutputStream());
        }
    }
}
```

# Ví dụ: CRUD cho Category Table

35


## □ Bước 12: Kết quả

← → ↺ localhost:8080/ShoppingServletServiceMVC/admin/category/list ☆ N ⋮

Ứng dụng 🌐 Mô hình MVC & Co... 📁 Mô hình MVC tron... 📄 Tạo trang đăng nhậ... 📄 Java MVC Web App... 📄 JSP Servlet Hiberna... 📄 JSP Servlet MVC Ex... 📄 Bài tập java có lời g... 📄 (18) Redirect user t... » 📄 Danh sách đọc

### Dashboard

Xin chào Nguyễn Hữu Trung [Đăng xuất](#)



Bạn là Admin



- Dashboard
- Quản lý Danh mục
  - Thêm danh mục mới
  - Danh sách danh mục
- Quản lý sản phẩm
- Quản lý tài khoản

### Quản lý danh mục

Nơi bạn có thể quản lý danh mục của mình

Danh sách danh mục

10 records per page Search:

STT	Hình ảnh	Tên danh mục	Hành động
1		Quần Áo Nam	<a href="#">Sửa</a>   <a href="#">Xóa</a>
2		Quần Áo Nữ	<a href="#">Sửa</a>   <a href="#">Xóa</a>


## □ Bước 12: Kết quả

Chỉnh sửa danh mục

Danh mục:

Tên danh sách:

Quần Áo Nam



Ảnh đại diện

Chọn tệp Không có tệp nào được chọn

Edit

Reset