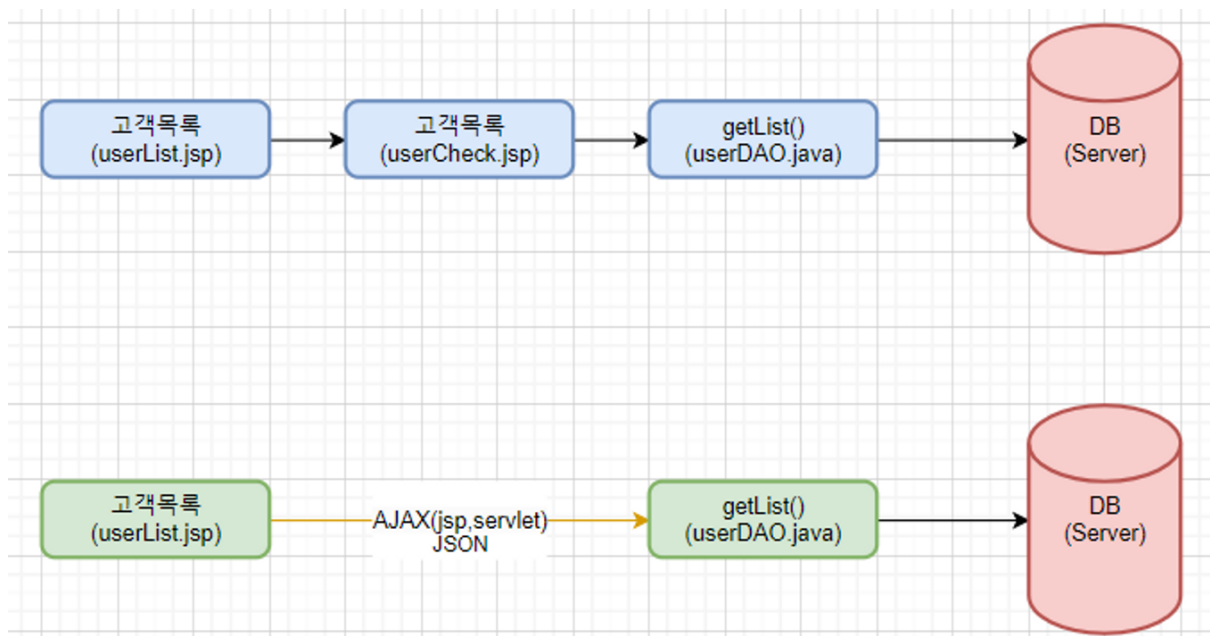


# 20230127 AJAX&JSON

## About

- JSP는 사용자의 요청에 대한 결과 페이지를 생성하기 위해 대부분의 역할 수행
- 이런 방식은 서버 중심의 처리 방식으로 볼 수 있다.
- 사용자가 많아지면 서버에 로드가 기하 급수적으로 커지는 문제점이 있다.
- 이러한 문제점은 페이스북, 트위터 등의 SNS가 등장하면서 더욱 현실화 되었다.
- 이를테면 SNS 서버에는 사용자가 10만명 30만명 등등 넘어가는 경우가 비일비재하다.
- 따라서 서버의 부하를 줄이기 위해 서버가 하던 작업을 클라이언트로 넘기는 다양한 기술이 등장했다.
- 그중 AJAX와 JSON이 핵심적인 역할을 수행 !!



## AJAX : Asynchronous JAVA and XML JAVA나 XML 형식의 데이터를 비동기식으로 전송하기 위한 기술

- AJAX는 URL을 동일하게 유지하면서 내부적으로 여러개의 HTTP 요청과 응답을 전송할 수 있도록 지원
- 이를 통해 웹 브라우저에서 페이지를 고치지 않고도 여러개의 HTTP 요청과 응답을 가능하게함.

Navbar			
			Search
Name	Age	Gender	Email
kim	23	male	kim@naver.com
권두현	24	male	hong@nate.com

- AJAX는 search에 키보드를 입력할때 화면이 바로바로 전환됨.

```
<form class="d-flex" role="search">
  <input class="form-control me-2" type="search" placeholder="Search" aria-label="Search">
  <button class="btn btn-outline-primary" type="submit">Search</button>
</form>
```

```
</ul>
```

```
<input class="form-control me-2" type="search" placeholder="Search" aria-label="Search">
<button class="btn btn-outline-primary" type="submit">Search</button>
```

```
</div>
```

AJAX를 사용하기 위해 기존에 사용하던 form 태그는 더 이상 사용되지 않는다. form 태그는 필연적으로 처리페이지로의 전달을 위해 화면 전환이 이루어지게 된다. 따라서 jquery 사용시에는 form 태그를 전혀 사용하지 않는다.

```
<input class="form-control me-2" type="search" id="userName" onkeyup="searchFunction()" placeholder="Search" aria-label="Search">
<button class="btn btn-outline-primary" onclick="searchFunction();" type="submit">Search</button>
```

form 태그 대신

onkeyup="searchFunction()" 키 입력시 마다 함수 호출

onclick="searchFunction();" 단추를 누를 경우 함수 호출 방식으로 처리가 변경된다.

## 비슷한 검색할때 회원 조회

```
//회원 조회
public static ArrayList<User> search(String userName) throws NamingException, SQLException{
    String sql = "SELECT * FROM user WHERE userName LIKE ?";

    Connection conn = ConnectionPool.get();

    PreparedStatement pstmt = conn.prepareStatement(sql);

    pstmt.setString(1, "%" + userName + "%");

    ResultSet rs = pstmt.executeQuery();

    ArrayList<User> users = new ArrayList<User>();

    while(rs.next()) {
        users.add(new User(rs.getString(1),
                            rs.getInt(2),
                            rs.getString(3),
                            rs.getString(4)));
    }

    return users;
}
```

## 잘되는것 테스트 해보기

- main.jsp

```
<%@ page contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<title>JSP AJAX</title>

</head>
<body>

<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0-alpha1/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-GLhLTQ8iRABdZLl603oVMWSktQOp6b7In1Zl3/Jr59b6EGGoIaFkw7cmDA6j6gD" crossorigin="anonymous">
<script src="https://code.jquery.com/jquery-3.6.3.min.js" integrity="sha256-pvPw+upLPUjgMXy0G+800xUf+/Im1MZjXxxgOcBQBxU=" crossorigin="anonymous"></script>

<script type="text/javascript">
var searchRequest = new XMLHttpRequest();
var registerRequest = new XMLHttpRequest();
function searchFunction() {
    searchRequest.open("Post", ".UserSearchServlet?userName=" + encodeURIComponent(document.getElementById('userName').value), true);
    searchRequest.onreadystatechange = searchProcess;
    searchRequest.send(null);
}
function searchProcess() {
    var table = document.getElementById('ajaxTable');
    table.innerHTML = "";
    if(searchRequest.readyState == 4 && searchRequest.status == 200) {
        var object = eval('(' + searchRequest.responseText + ')');
        var result = object.result;
        for(var i = 0; i < result.length; i++) {
            var row = table.insertRow(0);
            for(var j = 0; j < result[i].length; j++) {
                var cell = row.insertCell(j);
                cell.innerHTML = result[i][j].value;
            }
        }
    }
}
</script>

<br>
<nav class="navbar bg-dark" data-bs-theme="dark">
    <div class="container-fluid">
        <a class="navbar-brand">Navbar</a>
        <form class="d-flex" role="search">
            <input class="form-control me-2" type="search" id="userName" onkeyup="searchFunction()" placeholder="Search" aria-label="Search">
            <button class="btn btn-outline-success" onclick="searchFunction();" type="button">Search</button>
        </form>
    </div>
</nav>

<br>

<div class="container-sm">

    <table class="table table-dark table-hover">
        <thead>
            <tr>
                <th scope="col">Name</th>
                <th scope="col">Age</th>
                <th scope="col">Gender</th>
                <th scope="col">Email</th>
            </tr>
        </thead>
        <tbody id="ajaxTable">
        </tbody>
    </table>
</div>
```

```

<br>
<br>
<!-- <div class="container">
  <table class="table table-dark">
    <thead>
      <tr>
        <th colspan="2" style="text-align: center;">Register</th>
      </tr>
    </thead>
    <tbody>
      <tr>
        <td style="text-align: center;">Name</td>
        <td><input class="form-control" type="text" id="registerName"></td>
      </tr>
      <tr>
        <td style="text-align: center;">Age</td>
        <td><input class="form-control" type="text" id="registerAge"></td>
      </tr>
      <tr>
        <td style="text-align: center;">Gender</td>
        <td>
          <div class="form-group" style="text-align: center;">
            <div class="btn-group" data-toggle="buttons">
              <label class="btn btn-success">
                <input type="radio" name="registerGender" value="male">Male
              </label>
              <label class="btn btn-danger">
                <input type="radio" name="registerGender" value="female" checked>Female
              </label>
            </div>
          </div>
        </td>
      </tr>
      <tr>
        <td style="text-align: center;">Email</td>
        <td><input class="form-control" type="text" id="registerEmail" size="20"></td>
      </tr>
      <tr>
        <td colspan="2" style="text-align: center;"><button class="btn btn-primary pull-right" onclick="registerFunction();" t
ype="button">S e n d</button></td>
      </tr>
    </tbody>
  </table>
</div>
-->

</body>
</html>

```

- UserSearchServlet

```

package user;

import java.io.IOException;
import java.util.ArrayList;

import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

@WebServlet("/UserSearchServlet")
public class UserSearchServlet extends HttpServlet {
    private static final long serialVersionUID = 1L;

    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        request.setCharacterEncoding("UTF-8");
        response.setContentType("text/html; charset=UTF-8");
        String userName = request.getParameter("userName");
        response.getWriter().write(getJSON(userName));
    }

    public String getJSON(String userName) {
        if(userName == null) userName = "";
        StringBuffer result = new StringBuffer("");
        result.append("{\"result\":[");
        UserDao userDao = new UserDao();
        ArrayList<User> userList = userDao.search(userName);
    }

```

```

for(int i = 0; i < userList.size(); i++) {
    result.append("{\"value\": \"" + userList.get(i).getUserName() + "\"},");
    result.append("{\"value\": \"" + userList.get(i).getUserAge() + "\"},");
    result.append("{\"value\": \"" + userList.get(i).getUserGender() + "\"},");
    result.append("{\"value\": \"" + userList.get(i).getUserEmail() + "\"}],");
}
result.append("]");
return result.toString();
}
}

```

- UserDao.java

```

public ArrayList<User> search(String userName) {
    String SQL = "SELECT * FROM USER WHERE userName LIKE ?";
    ArrayList<User> userList = new ArrayList<User>();
    try {
        pstmt = conn.prepareStatement(SQL);
        pstmt.setString(1, "%" + userName + "%");
        rs = pstmt.executeQuery();
        while (rs.next()) {
            User user = new User();
            user.setUserName(rs.getString(1));
            user.setUserAge(rs.getInt(2));
            user.setUserGender(rs.getString(3));
            user.setUserEmail(rs.getString(4));
            userList.add(user);
        }
    } catch (Exception e) {
        e.printStackTrace();
    }
    return userList;
}

```

☐ DAO확인 , 검색확인 해보기

- maxtotal ??

## ajax basic

## ajax adv

## JSON - JavaScript Object Notation

- 자바스크립트에서 객체를 표현하기 위한 형식
- XML과 유사하지만 xml에 비해 쉬운 문법을 사용하고 처리속도가 빠르다.

## XML

```
<empinfo>
  <employees>
    <employee>
      <name>James Kirk</name>
      <age>40</age>
    </employee>
    <employee>
      <name>Jean-Luc Picard</name>
      <age>45</age>
    </employee>
    <employee>
      <name>Wesley Crusher</name>
      <age>27</age>
    </employee>
  </employees>
</empinfo>
```

## JSON

```
{ "empinfo" :
  {
    "employees" : [
      {
        "name" : "James Kirk",
        "age" : 40,
      },
      {
        "name" : "Jean-Luc Picard",
        "age" : 45,
      },
      {
        "name" : "Wesley Crusher",
        "age" : 27,
      }
    ]
  }
}
```

### 객체 형식

```
{
  id : "Kim@naver.com",
  pass : "0000",
  name : "kim"
}
```

### 배열 형식


```
{
  0 : "Kim@naver.com",
  1 : "0000",
  2 : "kim"
}
```

```
[
  { id : "Kim@naver.com", pass : "0000", name : "kim"},
  { id : "hong@naver.com", pass : "1111", name : "hong"},
  { id : "doo@naver.com", pass : "2222", name : "doo"},
]
```

code.google.com/archive/p/json-simple/downloads

Google Code Archive

Projects Search About

**Project**  **json-simple**

Source

Issues

Wikis

Downloads

File	Summary + Labels
<a href="#">json-simple-1.1.1.jar</a>	1.1.1 binary, with maven and OSGi support <b>Type-Archive</b>

File Explorer View:

- WEB-INF
  - lib
    - json-simple-1.1.1.jar
    - mysql-connector-j-8.0.31.jar

```
public static String getListJSON() throws NamingException, SQLException{

    String sql = "SELECT * FROM user";

    Connection conn = ConnectionPool.get();

    PreparedStatement pstmt = conn.prepareStatement(sql);

    ResultSet rs = pstmt.executeQuery();

    JSONArray users = new JSONArray();

    while(rs.next()) {
        JSONObject obj = new JSONObject();
        obj.put("userName", rs.getString("userName"));
        obj.put("userAge", rs.getString("userAge"));
        obj.put("userGender", rs.getString("userGender"));
        obj.put("userEmail", rs.getString("userEmail"));
        users.add(obj);
    }

    return users.toJSONString();
}
```

```
1 <%@page import="user.UserDAO"%>
2 <%@ page language="java" contentType="text/html; charset=UTF-8"
3   pageEncoding="UTF-8"%>
4 <%
5
6   out.print((new UserDAO()).getListJSON());
7
8 %>
9
```