

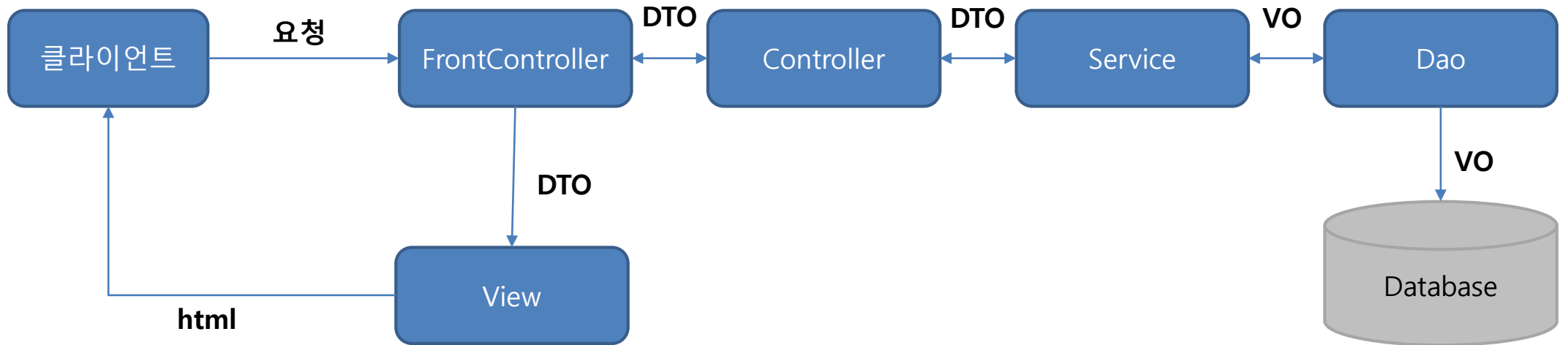
2024년 상반기 K-디지털 트레이닝

FrontController

[KB] IT's Your Life

✓ FrontController

- 모든 요청을 받고, 요청의 종류에 따라 작업을 분기하는 Dispatcher Servlet
- MVC 패턴에서 제일 앞 단에 위치



FrontControllerServlet.java

```
@WebServlet(name = "frontControllerServlet", value = "/")
public class FrontControllerServlet extends HttpServlet {

    public void init() {
    }

    public void doGet(HttpServletRequest request, HttpServletResponse response) throws IOException, ServletException {
    }

    public void doPost(HttpServletRequest request, HttpServletResponse response) throws IOException, ServletException {
        doGet(request, response);
    }

}
```

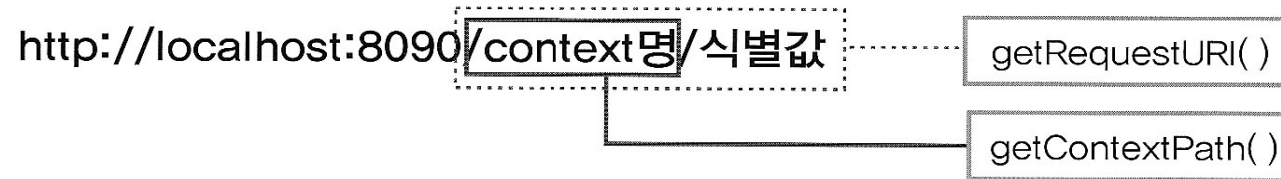
✓ FrontController

○ 사용자 요청 식별 방법

- url의 구성
 - http://서버IP번호:포트번호/context명/경로(식별값)
 - 경로(식별값): 수행해야할 명령에 해당

✓ FrontController

○ 식별값 추출하기



```
private String getCommandName(HttpServletRequest request) {  
    String requestURI = request.getRequestURI();  
    String contextPath = request.getContextPath();  
    return requestURI.substring(contextPath.length());  
}
```

✓ FrontController

○ 요청별 처리 코드 찾기

- Command 패턴 적용
- Map<String, Command>
 - 키: 요청 식별값
 - 값: Command 인터페이스 구현체(메서드 참조)

/create → CreateCommand

/get → GetCommand

...

- Map에 없다면 404 에러

Command.java

```
package org.scoula.ex05.command;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;

public interface Command {
    String execute(HttpServletRequest request, HttpServletResponse response) throws IOException;
}
```

FrontControllerServlet.java

```
@WebServlet(name = "frontControllerServlet", value = "/")
public class FrontControllerServlet extends HttpServlet {
    Map<String, Command> getMap;
    Map<String, Command> postMap;

    public void init() {
        getMap = new HashMap<>();
        postMap = new HashMap<>();
    }
    ...
}
```


FrontControllerServlet.java

```
@WebServlet(name = "frontControllerServlet", value = "/")
public class FrontControllerServlet extends HttpServlet {
    ...
    private String getCommandName(HttpServletRequest request) {
        String requestURI = request.getRequestURI();
        String contextPath = request.getContextPath();
        return requestURI.substring(contextPath.length());
    }

    private Command getCommand(HttpServletRequest request) {
        String commandName = getCommandName(request);

        Command command;
        if(request.getMethod().equalsIgnoreCase("GET")) {
            command = getMap.get(commandName);
        } else {
            command = postMap.get(commandName);
        }

        return command;
    }
}
```

FrontControllerServlet.java

```
@WebServlet(name = "frontControllerServlet", value = "/")
public class FrontControllerServlet extends HttpServlet {
    ...

    public void execute(Command command, HttpServletRequest request, HttpServletResponse response)
        throws IOException, ServletException {

        String viewName = command.execute(request, response);
    }

    public void doGet(HttpServletRequest request, HttpServletResponse response) throws IOException, ServletException {
        Command command = getCommand(request);
        if(command != null) {
            execute(command, request, response);
        } else { // 404 에러 처리
        }
    }
}
```

✓ 컨트롤러

- 실제 요청을 처리하고 흐름을 제어하는 역할
- 각 메서드는 Command 인터페이스와 일치하게 작성
- GET 요청
 - 리턴값은 뷰의 이름
"/views/" + 뷰이름 + ".jsp"
prefix suffix → FrontController에서 처리
 - 예: todo/list
 - /views/todo/list.jsp
 - FrontController에서 forward 처리
- POST 요청
 - 리턴값은 리다이렉트할 url
"redirect:redirect url" 형식
 - FrontController에서 redirect 처리

HomeController.java

```
package org.scoula.ex05.controller;

import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;

public class HomeController {
    public String getIndex(HttpServletRequest req, HttpServletResponse resp) throws IOException {
        return "index";
    }
}
```

view 이름: index;
→ /views/index.jsp

views/index.jsp

```
<%@ page contentType="text/html; charset=UTF-8" pageEncoding="UTF-8" %>
<!DOCTYPE html>
<html>
<head>
  <title>JSP - Hello World</title>
</head>
<body>
  <h1>FrontController</h1>
  <br/>
  <a href="/todo/list">Todo 목록보기</a>
</body>
</html>
```

FrontControllerServlet.java

```
@WebServlet(name = "frontControllerServlet", value = "/")
public class FrontControllerServlet extends HttpServlet {
    ...
    String prefix = "/views/";
    String suffix = ".jsp";

    HomeController homeController = new HomeController();

    public void init() {
        ...

        getMap.put("/", homeController::getIndex);
    }
    public void execute(Command command, HttpServletRequest request, HttpServletResponse response)
        throws IOException, ServletException {

        String viewName = command.execute(request, response);
        if(viewName.startsWith("redirect:")) { // redirect 처리
            response.sendRedirect(viewName.substring("redirect:".length()));
        } else { // forward 처리
            String view = prefix + viewName + suffix;
            RequestDispatcher dis = request.getRequestDispatcher(view);
            dis.forward(request, response);
        }
    }
}
```

✓ 404에러 처리

- URL 맵핑 맵에 없는 경우
 - /views/404.jsp로 리다이렉트

/views/404.jsp

```
<%@ page contentType="text/html; charset=UTF-8" language="java" %>
<html>
<head>
  <title>Title</title>
</head>
<body>

  <h1>404</h1>
  <h3>요청하신 페이지가 존재하지 않습니다.</h3>

</body>
</html>
```


FrontControllerServlet.java

```
public void doGet(HttpServletRequest request, HttpServletResponse response) throws IOException, ServletException {  
    Command command = getCommand(request);  
    if(command != null) {  
        execute(command, request, response);  
    } else { // 404 에러 처리  
        String view = prefix + "404" + suffix;  
        RequestDispatcher dis = request.getRequestDispatcher(view);  
        dis.forward(request, response);  
    }  
}
```

✅ Todo 만들기

METHOD	URL	컨트롤러 메서드	뷰 이름
GET	/todo/list	getList	todo/list
GET	/todo/view	getView	todo/view
GET	/todo/create	getCreate	todo/create
POST	/todo/create	postCreate	redirect:/todo/list
GET	/todo/update	getUpdate	todo/update
POST	/todo/update	postUpdate	redirect:/todo/list
POST	/todo/delete	postdDelete	redirect:/todo/list

TodoController.java

```
package org.scoula.ex05.controller;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.util.Arrays;
import java.util.List;

import static sun.jvm.hotspot.code.CompressedStream.L;

public class TodoController {
    public String getList(HttpServletRequest request, HttpServletResponse response) throws IOException {
        List<String> list = Arrays.asList("Todo 1", "Todo 2", "Todo 3");
        request.setAttribute("todoList", list);
        System.out.println("GET /todo/list");
        return "todo/list";
    }

    public String getView(HttpServletRequest request, HttpServletResponse response) throws IOException {
        System.out.println("GET /todo/view");
        return "todo/view";
    }
}
```

TodoController.java

```
public String getCreate(HttpServletRequest request, HttpServletResponse response) throws IOException {
    System.out.println("GET /todo/create");
    return "todo/create";
}

public String postCreate(HttpServletRequest request, HttpServletResponse response) throws IOException {
    System.out.println("POST /todo/create");
    return "redirect:/todo/list";
}

public String getUpdate(HttpServletRequest request, HttpServletResponse response) throws IOException {
    System.out.println("GET /todo/update");
    return "todo/update";
}

public String postUpdate(HttpServletRequest request, HttpServletResponse response) throws IOException {
    System.out.println("POST /todo/update");
    return "redirect:/todo/list";
}

public String postDelete(HttpServletRequest request, HttpServletResponse response) throws IOException {
    System.out.println("POST /todo/delete");
    return "redirect:/todo/list";
}
}
```

/views/todo/list.jsp

```
<%@ page contentType="text/html; charset=UTF-8" language="java" %>
<html>
<head>
  <title>Title</title>
</head>
<body>
  <h1>Todo 목록 보기</h1>
  <div>
    ${todoList}
    <a href="view" >상세보기</a>
  </div>
  <div>
    <a href="create">새 Todo</a>
  </div>
</body>
</html>
```

Todo 목록 보기

[Todo 1, Todo 2, Todo 3] [상세보기](#)
[새 Todo](#)

/views/todo/view.jsp

```
<%@ page contentType="text/html; charset=UTF-8" language="java" %>
<html>
<head>
  <title>Title</title>
</head>
<body>
  <h1>Todo 보기</h1>

  <div>
    <a href="list">목록보기</a> |
    <a href="update">수정하기</a>
  </div>

  <form action="delete" method="POST">
    <input type="submit" value="삭제">
  </form>

</body>
</html>
```

Todo 보기

[목록보기](#) | [수정하기](#)

삭제

/views/todo/create.jsp

```
<%@ page contentType="text/html; charset=UTF-8" language="java" %>
<html>
<head>
  <title>Title</title>
</head>
<body>
  <h1>새 Todo 생성</h1>
  <form method="POST">
    <input type="submit">
  </form>

</body>
</html>
```

새 Todo 생성

제출

/views/todo/update.jsp

```
<%@ page contentType="text/html; charset=UTF-8" language="java" %>
<html>
<head>
  <title>Title</title>
</head>
<body>
  <h1>Todo 수정</h1>
  <form method="POST">
    <input type="submit">
  </form>
</body>
</html>
```

Todo 수정

제출

FrontControllerServlet.java

```
@WebServlet(name = "frontControllerServlet", value = "/")
public class FrontControllerServlet extends HttpServlet {
    ...
    TodoController todoController = new TodoController();
    ...
    public void init() {
        getMap = new HashMap<>();
        postMap = new HashMap<>();

        getMap.put("/", homeController::getIndex);

        getMap.put("/todo/list", todoController::getList);
        getMap.put("/todo/view", todoController::getView);
        getMap.put("/todo/create", todoController::getCreate);
        getMap.put("/todo/update", todoController::getUpdate);

        postMap.put("/todo/create", todoController::postCreate);
        postMap.put("/todo/update", todoController::postUpdate);
        postMap.put("/todo/delete", todoController::postDelete);
    }
    ...
}
```

✓ 또 다른 애플리케이션 제작 시 FrontController에서 수정되어야 하는 부분은 어디인가?

```
@WebServlet(name = "frontControllerServlet", value = "/")
public class FrontControllerServlet extends HttpServlet {
    ...
    HomeController homeController = new HomeController();
    TodoController todoController = new TodoController();

    String prefix = "/views/";
    String suffix = ".jsp";

    public void init() {
        getMap = new HashMap<>();
        postMap = new HashMap<>();

        getMap.put("/", homeController::getIndex);

        getMap.put("/todo/list", todoController::getList);
        getMap.put("/todo/view", todoController::getView);
        getMap.put("/todo/create", todoController::getCreate);
        getMap.put("/todo/update", todoController::getUpdate);

        postMap.put("/todo/create", todoController::postCreate);
        postMap.put("/todo/update", todoController::postUpdate);
        postMap.put("/todo/delete", todoController::postDelete);
    }
    ...
}
```

✓ DispatcherServlet.java

```
// @WebServlet 애너테이션 붙이지 않음
public class DispatcherServlet extends HttpServlet {
    Map<String, Command> getMap;
    Map<String, Command> postMap;

    String prefix = "/views/";
    String suffix = ".jsp";

    public void init() {
        getMap = new HashMap<>();
        postMap = new HashMap<>();
        createMap(getMap, postMap);
    }

    protected void createMap(Map<String, Command> getMap, Map<String, Command> postMap) {

    }

    ...
}
```

✓ FrontControllerServlet.java

상속을 안하는 방법 ?

```
@WebServlet(name = "frontControllerServlet", value = "/")
public class FrontControllerServlet extends DispatcherServlet {

    HomeController homeController = new HomeController();
    TodoController todoController = new TodoController();

    @Override
    protected void createMap(Map<String, Command> getMap, Map<String, Command> postMap) {

        getMap.put("/", homeController::getIndex);

        getMap.put("/todo/list", todoController::getList);
        getMap.put("/todo/view", todoController::getView);
        getMap.put("/todo/create", todoController::getCreate);
        getMap.put("/todo/update", todoController::getUpdate);

        postMap.put("/todo/create", todoController::postCreate);
        postMap.put("/todo/update", todoController::postUpdate);
        postMap.put("/todo/delete", todoController::postDelete);
    }
}
```