

**1) 프런트 컨트롤러 패턴 실행 프로세스를 스프링 MVC의 주요 구성 요소를 통해 설명하시오.**

프런트 컨트롤러는 DispatcherServlet을 의미한다.

- ① DispatcherServlet이 HTTP 요청을 받는다.
- ② DispatcherServlet은 서브 Controller로 HTTP 요청 위임을 받는다. 이 단계에서 DispatcherServlet은 서브 Controller를 스프링 빈으로 등록한다.
- ③ 서브 Controller는 클라이언트의 요청 처리를 위해 DAO 객체를 호출한다.
- ④ DAO 객체는 리소스를 액세스하여 Model 객체를 생성 후 요청 결과를 리턴한다.
- ⑤ DispatcherServlet은 처리 결과에 적합한 뷰에 화면 처리 요청을 한다.
- ⑥ 선택된 뷰는 화면에 모델 객체를 가져와 화면을 처리한다.
- ⑦ 이과정을 통해 결국 HTTP요청에 응답을 한다.

**2) @ModelAttribute, @PathVariable, @RequestParam 차이점을 설명하시오.**

**@PathVariable**

URL 경로 내의 변수 값을 @PathVariable 적용 변수로 전달한다. 변수를 페이지로 전달해 요청 페이지에서 변수를 사용할 수 있다.

```
//http://localhost:8080/web /try/thankyou
@RequestMapping(value="/try/{msg}", method = RequestMethod.GET)
public String getUserTest(@PathVariable("msg") String msg) {
    logger.info(msg);...
```

**@RequestParam**

요청 파라미터 값을 @RequestParam 적용 변수로 전달한다. 변수를 로컬 함수내에서만 쓸 수 있다. 요청된 페이지로 변수를 전달하지 못한다.

```
// http://localhost:8080/web/tryA?msg=thankyou
@RequestMapping(value="tryA", method = RequestMethod.GET)
public String getUserTest1(@RequestParam("msg") String msg) {
    logger.info(msg);....
```

## **@ModelAttribute**

요청 파라미터 값을 @ModelAttribute 적용 변수로 전달한다. @RequestParam과 다른점은 배열 형태의 값을 지정할 수 있다. 예를 들면 tryC, tryD 양쪽 URL에 대응하는 메서드를 정의할 수 있다.

```
// http://localhost:8080/web/tryC?msg=thankyou
@RequestMapping(value={"/tryC", "/tryD"}, method = RequestMethod.GET)
public String getUserTest2(@ModelAttribute("msg") String msg) {
    logger.info(msg);.....
}
```

### **3) @RequestMapping, @RestController, @RequestBody, @ResponseBody의 의미를 설명하시오.**

#### **@RequestMapping**

URL과 컨트롤러 메서드의 매핑을 설정하는 애노테이션이다.

#### **@RestController**

REST API를 제공하는 컨트롤러를 의미한다.@Controller와 @ResponseBody의 의미를 합친 애노테이션이다.

#### **@RequestBody**

컨트롤러 메서드 매개 변수에 @RequestBody가 애노테이션 된 경우, 스프링은 요청된 HTTP request body를 해당 매개 변수에 바인딩한다.

#### **@ResponseBody**

컨트롤러 메소드가 @ResponseBody로 어노테이션 된 경우, 스프링은 반환 값을 나가는 HTTP response body에 바인딩한다. 스프링은 요청된 메시지의 HTTP 헤더에 있는 Content-Type을 기반으로 HTTP Message Converter를 사용하여 반환 값을 HTTP response body로 변환한다.

4)

workspace-sts-451 - http://localhost:8080/web/ - Spring Tool Suite 4

File Edit Navigate Search Project Run Window Help

Project Explorer

- IHPARK-dlanno
- IHPARK-dlxml
- IHPARK-maven
- IHPARK-mvc
  - Deployment Descriptor: IHPARK-mvc
  - Spring Elements
  - Java Resources
  - JavaScript Resources
  - Deployed Resources
  - src
    - main
      - java
        - org
          - ihp
            - web
              - controller
                - HomeController.java
                - MemberController.java
                - MemberRestController.java
                - urlController.java
              - domain
                - StudentVO.java
              - exception
                - DataNotFoundException
                - MemberControllerAdvice
              - service
                - MemberService.java
                - MockMemberService.java
          - resources
          - webapp
          - test
          - target
          - pom.xml

Browser: http://localhost:8080/web/

# Hello world!

The time on the server is 2020? 4? 24? (?) ?? 8? 56? 11?.

There is no active editor that provides an outline.

Runs: Errors

Failure Trace

Servers: Boot Dashboard Console Progress Problems

Tomcat v9.0 Server at localhost [Apache Tomcat] C:\Program Files\Java\jdk1.8.0\_241\bin\javaw.exe (2020. 4. 24. 오후 8:55:57)

INFO : org.ihp.web.controller.HomeController - Welcome home! The client locale is ko.

완료

✓ HomeController.java home.jsp

workspace-sts-451 - http://localhost:8080/web/ - Spring Tool Suite 4

File Edit Navigate Search Project Run Window Help

Project Explorer

- IHPARK-dlanno
- IHPARK-dlxml
- IHPARK-maven
- IHPARK-mvc
  - Deployment Descriptor: IHPARK-mvc
  - Spring Elements
  - Java Resources
  - JavaScript Resources
  - Deployed Resources
  - src
    - main
      - java
        - org
          - ihp
            - web
              - controller
                - HomeController.java
                - MemberController.java
                - MemberRestController.java
                - urlController.java
              - domain
                - StudentVO.java
              - exception
                - DataNotFoundException
                - MemberControllerAdvice
              - service
                - MemberService.java
                - MockMemberService.java
          - resources
          - webapp
          - test
          - target
          - pom.xml

Browser: http://localhost:8080/web/member/list

## 학생 목록

학생 등록

ID	PWD	USERNAME	SNUM	DEPART	MOBILE	EMAIL	
minzi	9836	김민지	2016122035	IOT Device	010-4353-9893	minzi@cyworld.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
thook	8987	김태훈	2015152016	blockchain	010-4397-3847	thook@naver.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
ok9938	3245	양현용	2015154023	카페사장	010-6545-2135	ok9938@gmail.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
ihp001	1234	박인호	2015154017	Network Engineer	010-4733-2189	ihp001@kpu.ac.kr	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
shp001	4321	박세호	20191010	Math	010-5220-1510	shp001@kaist.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>

There is no active editor that provides an outline.

Runs: Errors

Failure Trace

Servers: Boot Dashboard Console Progress Problems

Tomcat v9.0 Server at localhost [Apache Tomcat] C:\Program Files\Java\jdk1.8.0\_241\bin\javaw.exe (2020. 4. 24. 오후 8:55:57)

정보: 프로토타입 엔지니어 [ a.jp-nio-8009 ] 글(들) 시작합니다.

4월 24, 2020 8:56:10 오후 org.apache.catalina.startup.Catalina start

정보: 서버가 [9,895] 밀리초 내에 시작되었습니다.

INFO : org.ihp.web.controller.HomeController - Welcome home! The client locale is ko.

WARN : org.springframework.web.servlet.PageNotFound - No mapping for GET /web/list/member

INFO : org.ihp.web.controller.MemberController - /member/list URL called. then listMemembr method executed.

✓ MemberController.java, member\_list.jsp

workspace-sts-451 - http://localhost:8080/web/ - Spring Tool Suite 4

File Edit Navigate Search Project Run Window Help

Project Explorer

- IHPARK-dianno
- IHPARK-dixml
- IHPARK-maven
- IHPARK-mvc
  - Deployment Descriptor: IHPARK-mvc
  - Spring Elements
  - Java Resources
  - JavaScript Resources
  - Deployed Resources
  - src
    - main
      - java
        - org
          - ihp
            - web
              - controller
                - HomeController.java
                - MemberController.java
                - MemberRestController.java
                - urlController.java
              - domain
                - StudentVO.java
              - exception
                - DataNotFoundException.java
                - MemberControllerAdvice.java
              - service
                - MemberService.java
                - MockMemberService.java

Console

```

Tomcat v9.0 Server at localhost [Apache Tomcat] C:\Program Files\Java\jdk1.8.0_241\bin\javaw.exe (2020. 4. 24. 오후 9:06:18)
정보: 프로토콜 핸들러 ["ajp-nio-8009"]을(를) 시작합니다.
4월 24, 2020 9:06:31 오후 org.apache.catalina.startup.Catalina start
정보: 서버가 [10,663] 밀리초 내에 시작되었습니다.
INFO : org.ihp.web.controller.HomeController - Welcome home! The client locale is ko.
WARN : org.springframework.web.servlet.PageNotFound - No mapping for GET /web/list/member
INFO : org.ihp.web.controller.MemberController - /member/list URL called. then listMemebr method executed.
INFO : org.ihp.web.controller.MemberController - /read?id=ihp001 URL called. then readMemebr method executed.
  
```

학성 정보

LoginID	ihp001
LoginPWD	1234
YourName	박인호
StudentNumber	2015154017
Department	Network Engineer
Mobile	010-4733-2189
EmailNumber	ihp001@kpu.ac.kr

[학생 목록 보기](#)

✓ MemberController.java, member\_read.jsp

workspace-sts-451 - http://localhost:8080/web/ - Spring Tool Suite 4

File Edit Navigate Search Project Run Window Help

Project Explorer

- IHPARK-dianno
- IHPARK-dixml
- IHPARK-maven
- IHPARK-mvc
  - Deployment Descriptor: IHPARK-mvc
  - Spring Elements
  - Java Resources
  - JavaScript Resources
  - Deployed Resources
  - src
    - main
      - java
        - org
          - ihp
            - web
              - controller
                - HomeController.java
                - MemberController.java
                - MemberRestController.java
                - urlController.java
              - domain
                - StudentVO.java
              - exception
                - DataNotFoundException.java
                - MemberControllerAdvice.java
              - service
                - MemberService.java
                - MockMemberService.java

Console

```

Tomcat v9.0 Server at localhost [Apache Tomcat] C:\Program Files\Java\jdk1.8.0_241\bin\javaw.exe (2020. 4. 24. 오후 9:06:18)
INFO : org.ihp.web.controller.MemberController - /modify?id=minziURL POST method called. then modifyMemberPost method executed.
INFO : org.ihp.web.controller.MemberController - /member/list URL called. then listMemebr method executed.
INFO : org.ihp.web.controller.MemberController - /modify?id=ihp001 URL GET method called. then forward member_modify.jsp.
INFO : org.ihp.web.controller.MemberController - StudentVO [id=minzi, passwd=9836, username=김민지, snum=2016122035, depart=IoT Device, mobile:
INFO : org.ihp.web.controller.MemberController - /modify?id=minziURL POST method called. then modifyMemberPost method executed.
INFO : org.ihp.web.controller.MemberController - /member/list URL called. then listMemebr method executed.
INFO : org.ihp.web.controller.MemberController - /register URL GET method called. then forward member_register.jsp.
  
```

학성 정보 등록

LoginID	<input type="text" value="registerID"/>
LoginPWD	<input type="text" value="1234"/>
YourName	<input type="text" value="새로쓰는박인호"/>
StudentNumber	<input type="text" value="201577777"/>
Department	<input type="text" value="네트워크엔지니어"/>
MobileNumber	<input type="text" value="010-4733-2189"/>
EmailAddress	<input type="text" value="inhyopakr122@gmail.com"/>

✓ MemberController.java, member\_register.jsp

workspace-sts-451 - http://localhost:8080/web/ - Spring Tool Suite 4

File Edit Navigate Search Project Run Window Help

Project Explorer

- IHPARK-dianno
- IHPARK-dxml
- IHPARK-maven
- IHPARK-mvc
  - Deployment Descriptor: IHPARK-mvc
  - Spring Elements
  - Java Resources
  - JavaScript Resources
  - Deployed Resources
  - src
    - main
      - java
        - org
          - ihp
            - web
              - controller
                - HomeController.java
                - MemberController.java
                - MemberRestController.java
                - urlController.java
              - domain
                - StudentVO.java
              - exception
                - DataNotFoundException
                - MemberControllerAdvice
              - service
                - MemberService.java
                - MockMemberService.java

정보 수정

http://localhost:8080/web/member/modify?id=ihp001

## 학생 정보 수정

LoginID	ihp001
LoginPWD	1234
YourName	바뀐박인호
StudentNumber	1111111111
Department	Changed Engineer
MobileNumber	010-2433-4444
EmailAddress	changedmodify@kpu.ac.kr

최종 수정 다시작성

Console

```

INFO : org.ihp.web.controller.MemberController - StudentVO [id=registerID, passwd=1234, username=새로쓰는박인호, snum=2015777777, depart=네트워크엔
INFO : org.ihp.web.controller.MemberController - /register URL POST method called. then createMember method executed.
INFO : org.ihp.web.controller.MemberController - /member/list URL called. then listMemebr method executed.
INFO : org.ihp.web.controller.MemberController - /modify?id=ihp001 URL GET method called. then forward member_modify.jsp.
INFO : org.ihp.web.controller.MemberController - StudentVO [id=ihp001, passwd=1234, username=바뀐박인호, snum=1111111111, depart=Changed Engineer
INFO : org.ihp.web.controller.MemberController - /modify?id=ihp001URL POST method called. then modifyMemberPost method executed.
INFO : org.ihp.web.controller.MemberController - /member/list URL called. then listMemebr method executed.
  
```

원료

✓ MemberController.java, member\_modify.jsp

workspace-sts-451 - http://localhost:8080/web/ - Spring Tool Suite 4

File Edit Navigate Search Project Run Window Help

Project Explorer

- IHPARK-dianno
- IHPARK-dxml
- IHPARK-maven
- IHPARK-mvc
  - Deployment Descriptor: IHPARK-mvc
  - Spring Elements
  - Java Resources
  - JavaScript Resources
  - Deployed Resources
  - src
    - main
      - java
        - org
          - ihp
            - web
              - controller
                - HomeController.java
                - MemberController.java
                - MemberRestController.java
                - urlController.java
              - domain
                - StudentVO.java
              - exception
                - DataNotFoundException
                - MemberControllerAdvice
              - service
                - MemberService.java
                - MockMemberService.java

Student List

http://localhost:8080/web/member/list

## 학생 목록

학생 등록

ID	PWD	USERNAME	SNUM	DEPART	MOBILE	EMAIL	
minzi	9836	김민지	2016122035	IOT Device	010-4353-9893	minzi@cyworld.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
thook	8987	김태훈	2015152016	blockchain	010-4397-3847	thook@naver.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
registerID	1234	새로쓰는박인호	2015777777	네트워크엔지니어	010-4733-2189	inhyopakr122@gmail.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
ok9938	3245	양현용	2015154023	카페사장	010-6545-2135	ok9938@gmail.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
ihp001	1234	바뀐박인호	1111111111	Changed Engineer	010-2433-4444	changedmodify@kpu.ac.kr	<a href="#">정보 보기</a> <a href="#">정보 수정</a>
shp001	4321	박세호	20191010	Math	010-5220-1510	shp001@kaist.com	<a href="#">정보 보기</a> <a href="#">정보 수정</a>

Console

```

INFO : org.ihp.web.controller.MemberController - /modify?id=ihp001 URL GET method called. then forward member_modify.jsp.
INFO : org.ihp.web.controller.MemberController - StudentVO [id=ihp001, passwd=1234, username=바뀐박인호, snum=1111111111, depart=Changed Engineer
INFO : org.ihp.web.controller.MemberController - /modify?id=ihp001URL POST method called. then modifyMemberPost method executed.
INFO : org.ihp.web.controller.MemberController - /member/list URL called. then listMemebr method executed.
INFO : org.ihp.web.controller.MemberController - StudentVO [id=ihp001, passwd=1234, username=바뀐박인호, snum=1111111111, depart=Changed Engineer
INFO : org.ihp.web.controller.MemberController - /modify?id=ihp001URL POST method called. then modifyMemberPost method executed.
INFO : org.ihp.web.controller.MemberController - /member/list URL called. then listMemebr method executed.
  
```

원료

✓ 학생 등록, 학생 정보 수정을 하고 난 뒤 학생의 목록

workspace-sts-451 - http://localhost:8080/web/ - Spring Tool Suite 4

File Edit Navigate Search Project Run Window Help

Project Explorer

- db-springjdbc
- IHPARK-di
- IHPARK-dlanno
- IHPARK-dxml
- IHPARK-maven
- IHPARK-mvc
  - Deployment Descriptor: IHPARK-mvc
  - Spring Elements
  - Java Resources
  - JavaScript Resources
  - Deployed Resources
  - src
    - main
      - java
        - org
          - ihp
            - web
              - controller
                - HomeController.java
                - MemberController.java
                - MemberRestController.java
                - urlController.java
              - domain
              - exception
              - service
            - resources
            - webapp
            - test

http://localhost:8080/web/member/rest/ihp001

```
{ "id": "ihp001", "passwd": "1234", "username": "박인 효", "snum": "2015154017", "depart": "Network Engineer", "mobile": "010-4733-2189", "email": "ihp001@kpu.ac.kr" }
```

There is no active editor that provides an outline.

Runs: Errors:

Failure Trace

Servers Boot Dashboard Console Progress Problems

Tomcat v9.0 Server at localhost [Apache Tomcat] C:\Program Files\Java\jdk1.8.0\_241\bin\javaw.exe (2020. 4. 24. 오후 10:46:28)

정보: 프로토콜 핸들러 ["ajp-nio-8009"]을(를) 시작합니다.

4월 24, 2020 10:46:41 오후 org.apache.catalina.startup.Catalina start

정보: 서버가 [10,382] 밀리초 내에 시작되었습니다.

INFO : org.ihp.web.controller.HomeController - Welcome home! The client locale is ko.

WARN : org.springframework.web.servlet.PageNotFound - No mapping for GET /web/ihp001

WARN : org.springframework.web.servlet.PageNotFound - No mapping for GET /web/member/ihp001

INFO : org.ihp.web.controller.MemberRestController - /member/rest/{id} REST-API GET method called. then readMember method executed.

완료

✓ MemberRestController.java에 아이디 ihp001 요청