KB금융그룹 | 국민의 평생 금융파트너

2024년 상반기 K-디지털 트레이닝

Rest Controller

[KB] IT's Your Life

KB국민은행

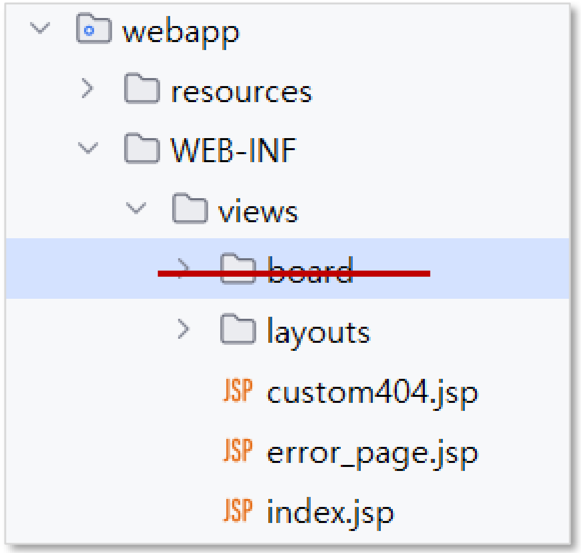
Rest Controller

프로젝트 생성

- board 프로젝트를 boardapi로 복사
- settings.gradle

```
rootProject.name = "boardapi"
```

- org.scoula.board.controller.BoardController.java 삭제
- board 뷰 삭제

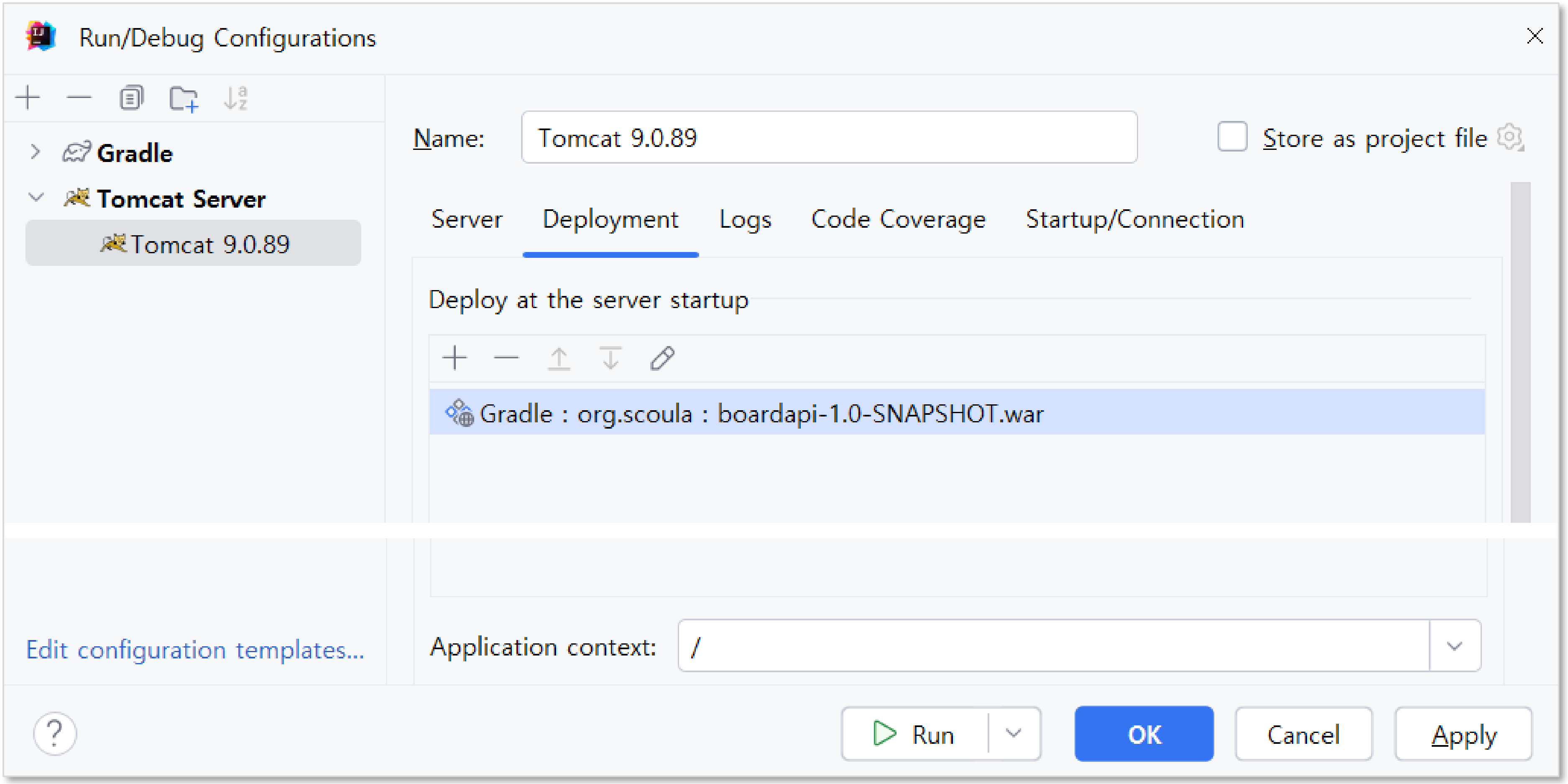


```
webapp
  resources
  WEB-INF
    views
      ~~board~~
      layouts
      custom404.jsp
      error_page.jsp
      index.jsp
```

Rest Controller

실행 설정

- Deployment
  - ArtifactId 추가
  - Application context: /



Run/Debug Configurations

Name: Tomcat 9.0.89

Store as project file

Gradle
Tomcat Server
Tomcat 9.0.89

Server | Deployment | Logs | Code Coverage | Startup/Connection

Deploy at the server startup

Gradle : org.scoula : boardapi-1.0-SNAPSHOT.war

Application context: /

Edit configuration templates...

Rest Controller

HomeController.java

```
package org.scoula.controller;

import lombok.extern.slf4j.Slf4j;
import org.springframework.stereotype.Controller;
import org.springframework.web.bind.annotation.GetMapping;

@Controller
@Slf4j
public class HomeController {

    @GetMapping("/")
    public String home() {
        log.info("================> HomController /");
        return "index";    // View의 이름

    }

}
```

Rest Controller

- API 서버에서 CUD(Create, Update, Delete)
  - 처리한 객체를 리턴
    - 생성된 객체
    - 업데이트된 객체
    - 삭제된 객체

→ BoardService 수정

Rest Controller

BoardService.java

```
public interface BoardService {
    public List<BoardDTO> getList();

    public BoardDTO get(Long no);

    public BoardDTO create(BoardDTO board);

    public BoardDTO update(BoardDTO board);

    public BoardDTO delete(Long no);

    public BoardAttachmentVO getAttachment(Long no);

    public boolean deleteAttachment(Long no);
}
```

Rest Controller

BoardServiceImpl.java

```
public class BoardServiceImpl implements BoardService {
    …
    @Transactional // 2개 이상의 insert 문이 실행될 수 있으므로 트랜잭션 처리 필요
    @Override
    public BoardDTO create(BoardDTO board) {
        log.info("create......" + board);

        BoardVO boardVO= board.toVo();
        mapper.create(boardVO);

        // 파일 업로드 처리
        List<MultipartFile> files = board.getFiles();
        if(files != null && !files.isEmpty()) {
            upload(boardVO.getNo(), files);
        }

        return get(boardVO.getNo());
    }
```

Rest Controller

BoardServiceImpl.java

```
    …

    @Override
    public BoardDTO update(BoardDTO board) {
        log.info("update......" + board);
        mapper.update(board.toVo());

        return get(board.getNo());
    }

    @Override
    public BoardDTO delete(Long no) {
        log.info("delete...." + no);
        BoardDTO board = get(no);

        mapper.delete(no);
        return board;
    }   …
}
```

1 Rest Controller

Rest Api용 컨트롤러

- @RestController
  - 모든 메서드에 @ResponseBody를 자동으로 추가
    - 응답 헤더에 content-type을 application/json 타입으로 설정
    - 메서드가 객체를 리턴하면 자동으로 Json 문자열로 변환
    - jackson 라이브러리가 담당
  - 요청의 body가 application/json 인코딩인 경우, 매개변수 앞에 @ReqeustBody 사용

- 매핑 어노테이션
  - @GetMapping(url)
  - @PostMapping(url)
  - @PutMapping(url)
  - @DeleteMapping(url)

Rest Controller

BoardController.java

```
package org.scoula.board.controller;

import org.scoula.board.service.BoardService;
import org.scoula.board.domain.BoardDTO;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.*;

import java.util.List;

@RestController
@RequestMapping("/api/board")
@RequiredArgsConstructor
@Slf4j
public class BoardController {

    private final BoardService service;

}
```

Rest Controller

BoardController.java

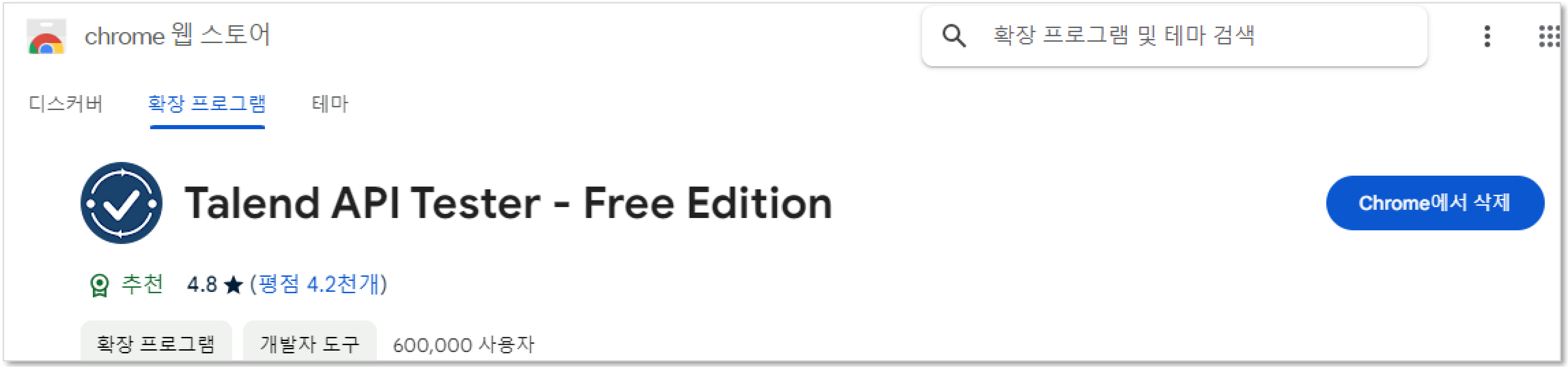
```
@GetMapping("")
public List<BoardDTO> getList() {
    return service.getList();
}
```

- GET::http://localhost:8080/api/board

Rest Controller

Talend API Tester

- Rest API 호출 테스트를 할 수 있는 크롬 확장 프로그램
- 구글: "talend api 확장" 검색



chrome 웹 스토어

확장 프로그램 및 테마 검색

디스커버 확장 프로그램 테마

Talend API Tester - Free Edition

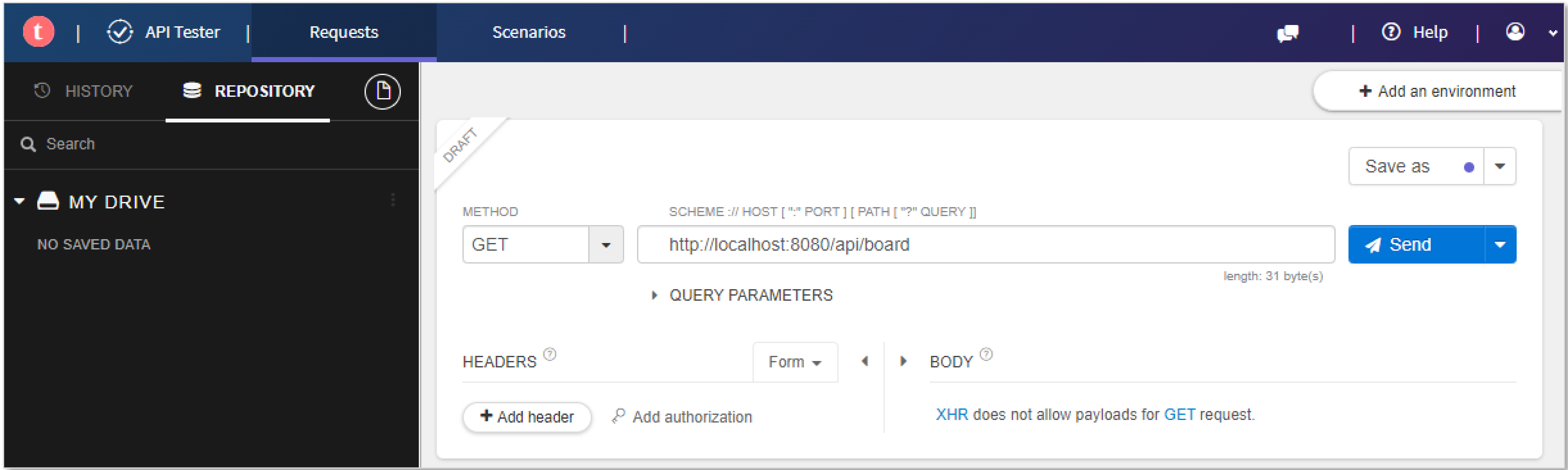
Chrome에서 삭제

추천 4.8 ★ (평점 4.2천개)

확장 프로그램 개발자 도구 600,000 사용자

Rest Controller

- GET :: http://localhost:8080/api/board

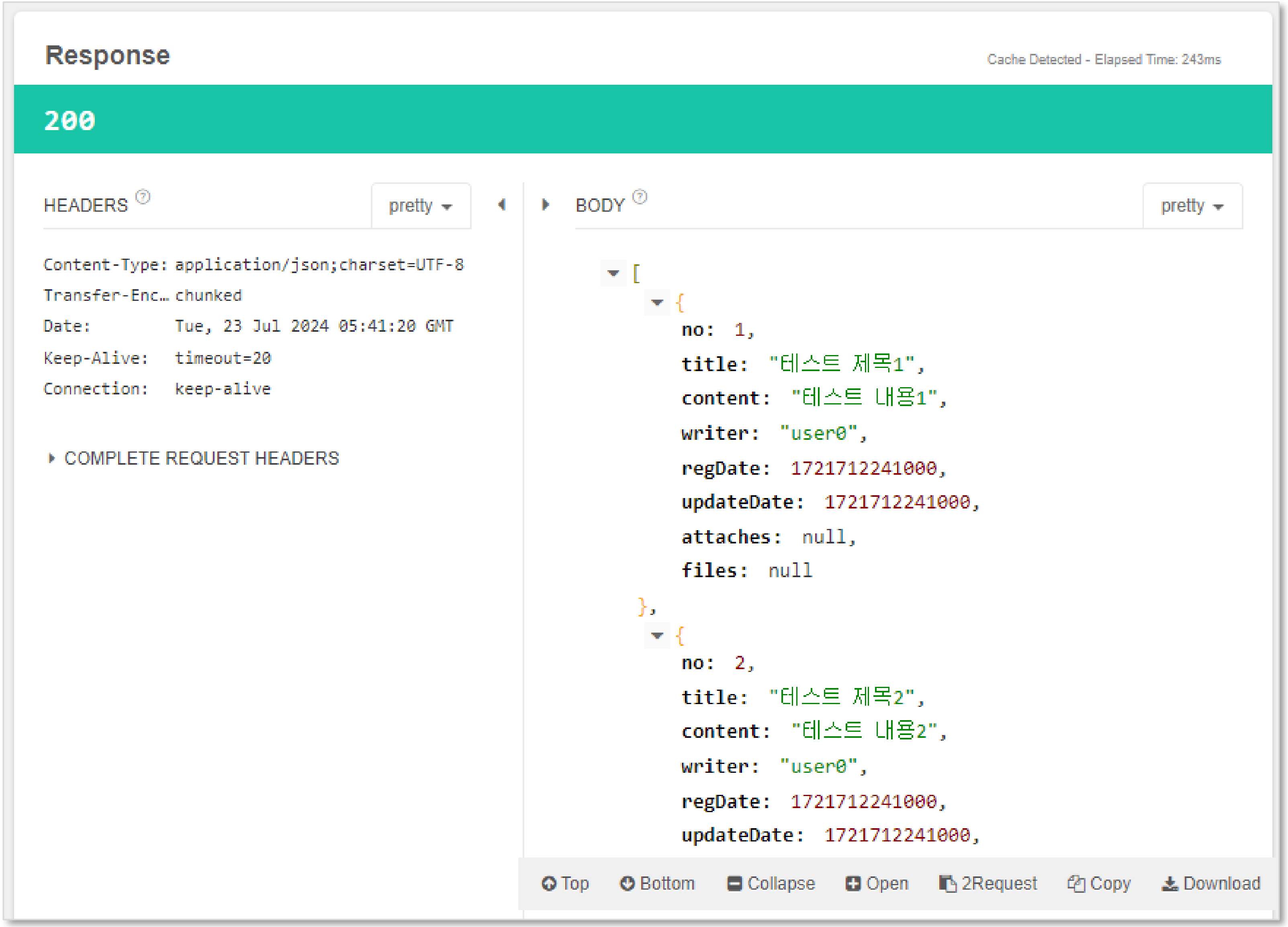


METHOD: GET
SCHEME :// HOST [":" PORT] [PATH ["?" QUERY]]: http://localhost:8080/api/board
length: 31 byte(s)

XHR does not allow payloads for GET request.

Rest Controller

- GET :: http://localhost:8080/api/board



Response

Cache Detected - Elapsed Time: 243ms

200

HEADERS

```
Content-Type: application/json;charset=UTF-8
Transfer-Enc… chunked
Date:         Tue, 23 Jul 2024 05:41:20 GMT
Keep-Alive:   timeout=20
Connection:   keep-alive
```

COMPLETE REQUEST HEADERS

BODY

```
[
    {
        no: 1,
        title: "테스트 제목1",
        content: "테스트 내용1",
        writer: "user0",
        regDate: 1721712241000,
        updateDate: 1721712241000,
        attaches: null,
        files: null
    },
    {
        no: 2,
        title: "테스트 제목2",
        content: "테스트 내용2",
        writer: "user0",
        regDate: 1721712241000,
        updateDate: 1721712241000,
```

Rest Controller

ResponseEntity<T>

- Rest Controller가 객체를 리턴하는 경우 상태 코드/헤더 설정하기 힘듦
- ResponseEntity<T>를 사용하면 상태 코드, 응답 헤더, body를 설정할 수 있음.

```
public class HttpEntity<T> {

    private final HttpHeaders headers;

    @Nullable
    private final T body;
}



public class RequestEntity<T> extends HttpEntity<T>

public class ResponseEntity<T> extends HttpEntity<T>
```

Rest Controller

ResponseEntity<T> 생성자

```
public ResponseEntity(HttpStatus status) {
    this(null, null, status);
}

public ResponseEntity(@Nullable T body, HttpStatus status) {
    this(body, null, status);
}

public ResponseEntity(@Nullable T body, @Nullable MultiValueMap<String, String> headers, HttpStatus status) {
    super(body, headers);
    Assert.notNull(status, "HttpStatus must not be null");
    this.status = status;
}
```

Rest Controller

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ResponseEntity<T> 생성

생성자 패턴(비권장)

```
return new ResponseEntity(body, headers, HttpStatus.valueOf(200));
```

빌더 패턴 (권장)

```
return ResponseEntity.ok().build();    // 200 코드만 구성

return ResponseEntity.ok(body);        // 200 코드 +  body 구성

return ResponseEntity.ok()             // 200 코드 + 헤더 + body 구성
                     .headers(headers)
                     .body(body);

resturn ResponseEntiry.status(상태코드).build();              // 상태 코드만 구성

resturn ResponseEntiry.status(상태코드).body(body);  // 상태 코드 + body 구성

resturn ResponseEntiry.status(상태코드).headers(headers).body(body);    // 상태 코드 + header + body 구성
```

Rest Controller

BoardController.java

```
@GetMapping("")
public ResponseEntity<List<BoardDTO>> getList() {
    return ResponseEntity.ok(service.getList());
}
```

- GET::http://localhost:8080/api/board

Rest Controller

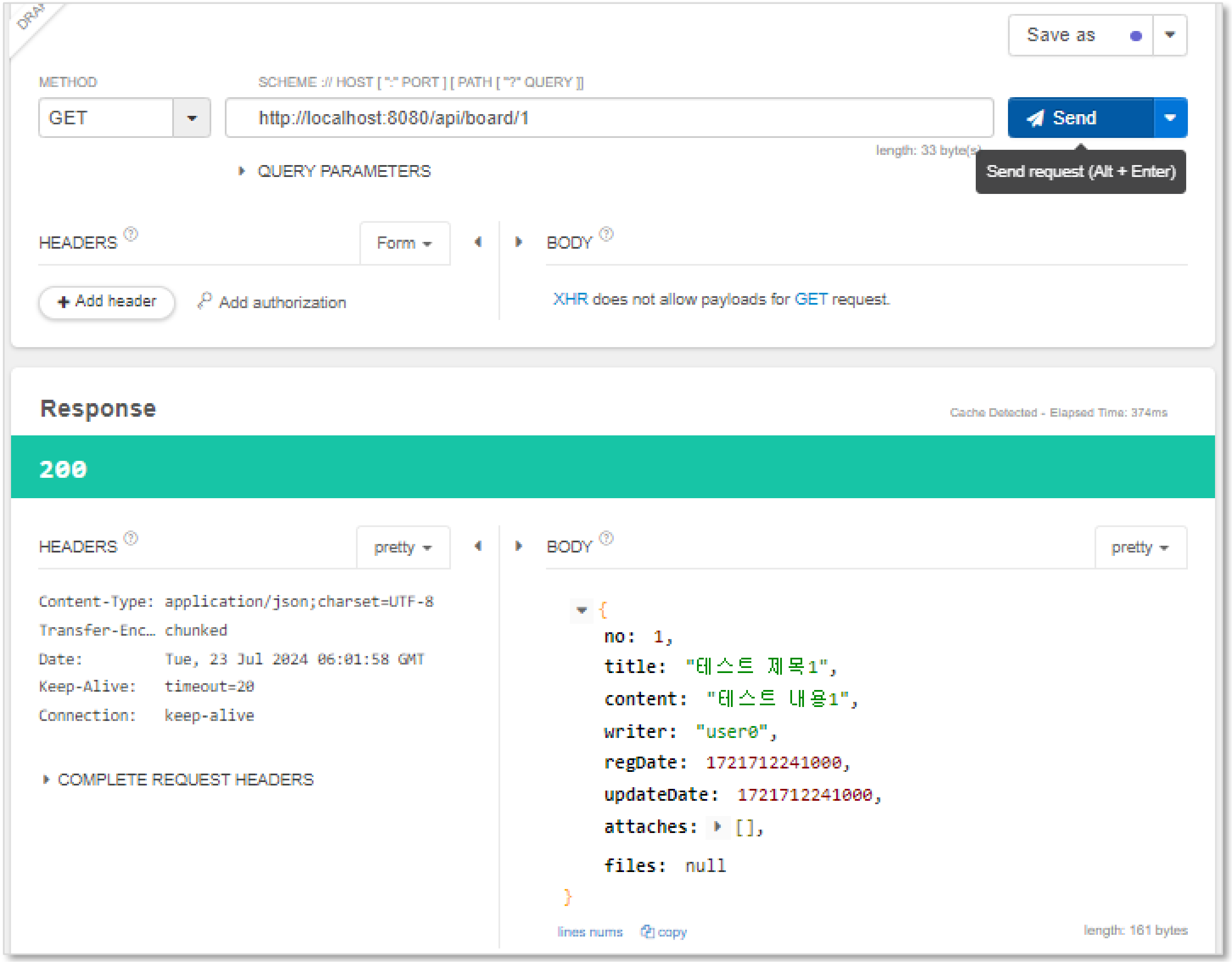
BoardController.java

```
@GetMapping("/{no}")
public ResponseEntity<BoardDTO> getById(@PathVariable Long no) {
    return ResponseEntity.ok(service.get(no));
}
```

- GET::http://localhost:8080/api/board/1

Rest Controller

GET :: http://localhost:8080/api/board/1


Save as
METHOD
SCHEME :// HOST [":" PORT] [PATH ["?" QUERY]]
GET
http://localhost:8080/api/board/1
Send
length: 33 byte(s)
Send request (Alt + Enter)
QUERY PARAMETERS
HEADERS
Form
BODY
Add header
Add authorization
XHR does not allow payloads for GET request.
Response
Cache Detected - Elapsed Time: 374ms
200
HEADERS
pretty
BODY
pretty
COMPLETE REQUEST HEADERS
lines nums
copy
length: 161 bytes

```
Content-Type: application/json;charset=UTF-8
Transfer-Enc… chunked
Date:         Tue, 23 Jul 2024 06:01:58 GMT
Keep-Alive:   timeout=20
Connection:   keep-alive
```

```
{
  no: 1,
  title: "테스트 제목1",
  content: "테스트 내용1",
  writer: "user0",
  regDate: 1721712241000,
  updateDate: 1721712241000,
  attaches: [],
  files: null
}
```

Rest Controller

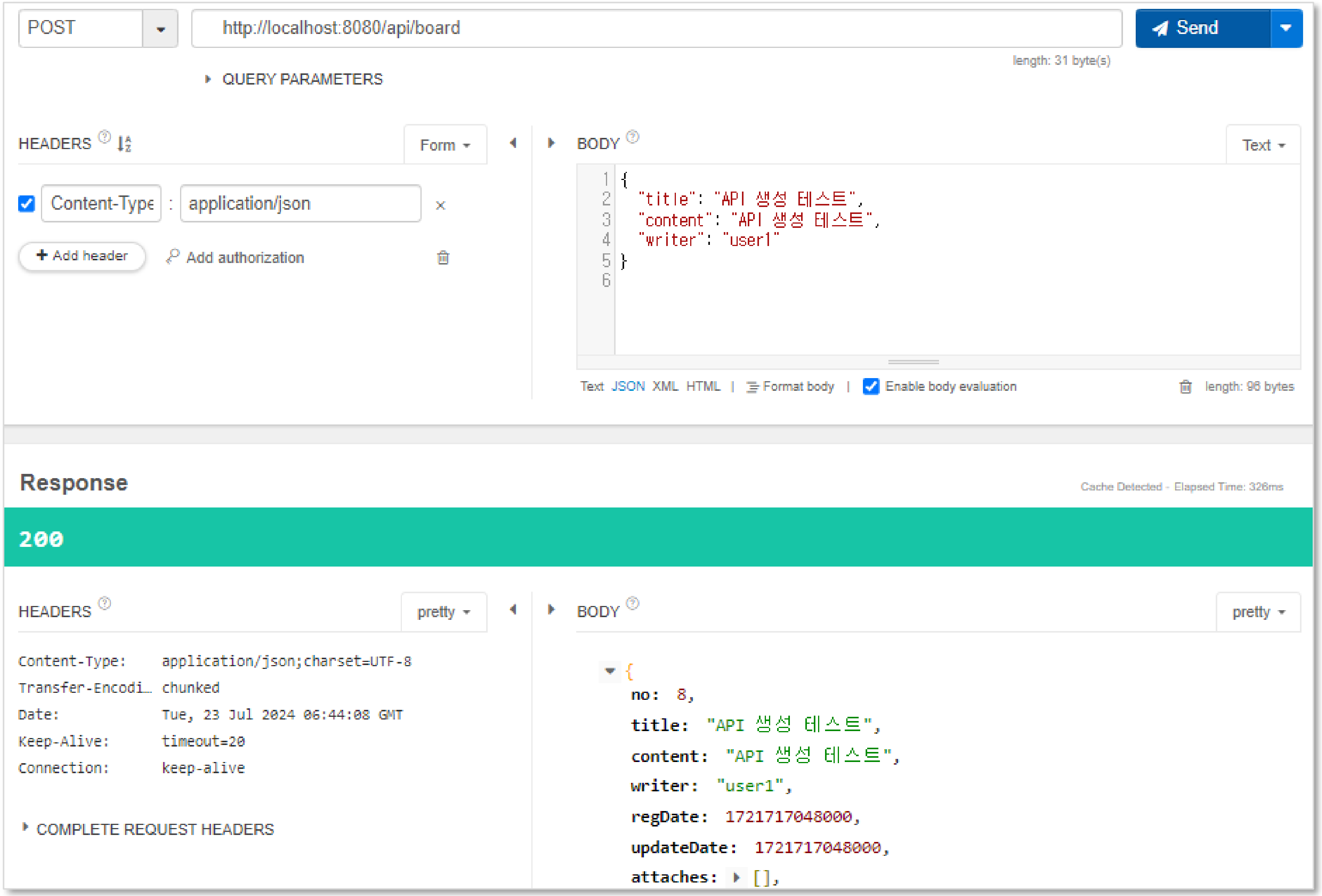
BoardController.java

```
@PostMapping("")
public ResponseEntity<Board> add(@RequestBody BoardDTO boardDTO) {
    Board board = boardDTO.to();
    return ResponseEntity.ok(service.add(board));
}
```

- POST::http://localhost:8080/api/board
  - BODY
    - Board 내용을 JSON 인코딩

Rest Controller

- POST :: http://localhost:8080/api/board



POST http://localhost:8080/api/board

length: 31 byte(s)

HEADERS

Content-Type : application/json

BODY

```
{
  "title": "API 생성 테스트",
  "content": "API 생성 테스트",
  "writer": "user1"
}
```

length: 96 bytes

Response

Cache Detected - Elapsed Time: 326ms

200

HEADERS

```
Content-Type:       application/json;charset=UTF-8
Transfer-Encodi…    chunked
Date:               Tue, 23 Jul 2024 06:44:08 GMT
Keep-Alive:         timeout=20
Connection:         keep-alive
```

BODY

```
{
  no: 8,
  title: "API 생성 테스트",
  content: "API 생성 테스트",
  writer: "user1",
  regDate: 1721717048000,
  updateDate: 1721717048000,
  attaches: [],
```

Rest Controller

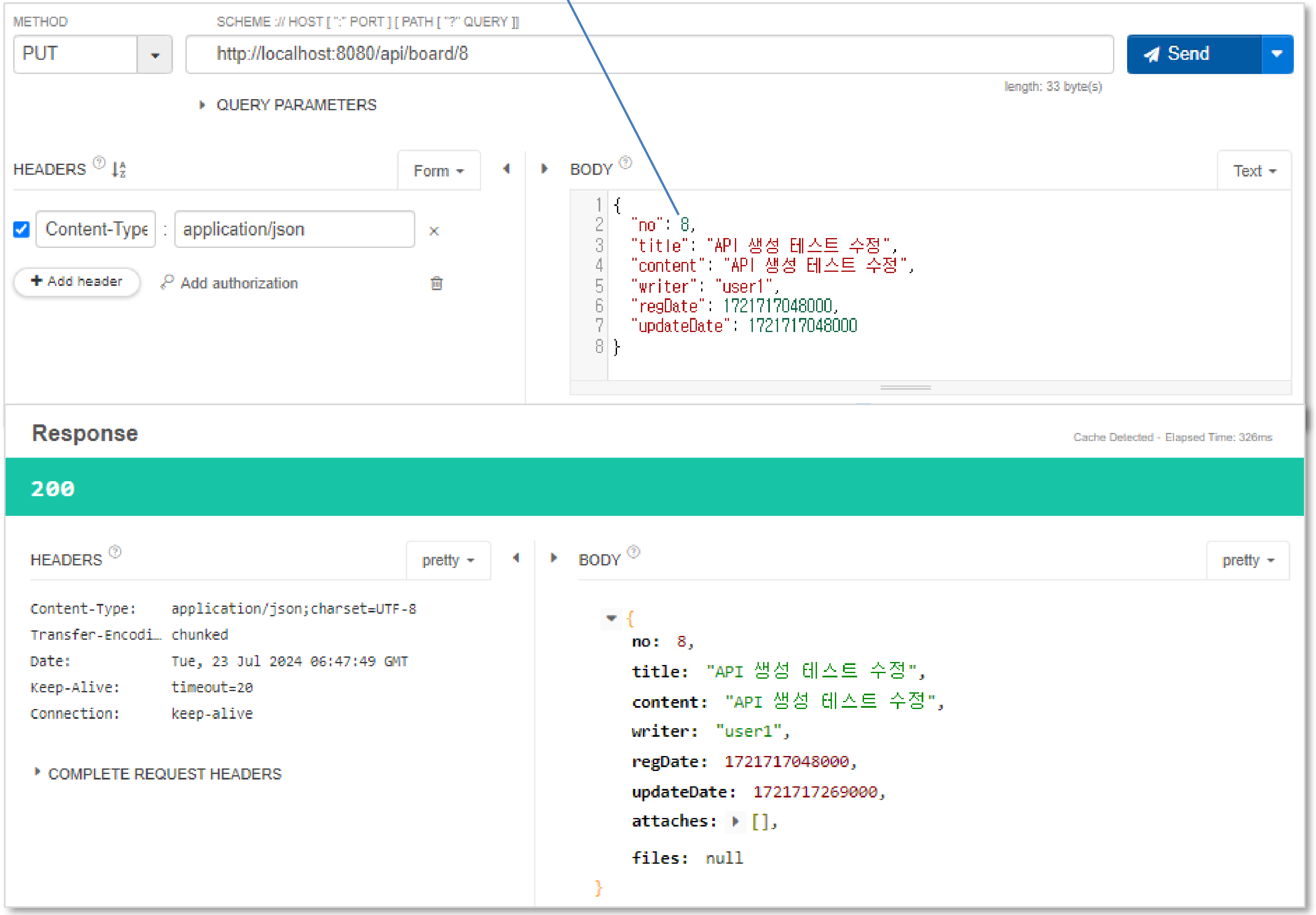
BoardController.java

```
@PutMapping("/{no}")
public ResponseEntity<Board> update(@PathVariable int id, @RequestBody Board board) {
    Board updatedBoard =service.update(board);
    return ResponseEntity.ok(updatedBoard);
}
```

- PUT::http://localhost:8080/api/board/11
  - BODY
    - Board 내용을 JSON 인코딩

Rest Controller

- PUT::http://localhost:8080/api/board/8



http://localhost:8080/api/board/8

Content-Type : application/json

```
{
  "no": 8,
  "title": "API 생성 테스트 수정",
  "content": "API 생성 테스트 수정",
  "writer": "user1",
  "regDate": 1721717048000,
  "updateDate": 1721717048000
}
```

200

```
Content-Type:       application/json;charset=UTF-8
Transfer-Encodi…    chunked
Date:               Tue, 23 Jul 2024 06:47:49 GMT
Keep-Alive:         timeout=20
Connection:         keep-alive
```

```
{
  no:  8,
  title:  "API 생성 테스트 수정",
  content:  "API 생성 테스트 수정",
  writer:  "user1",
  regDate:  1721717048000,
  updateDate:  1721717269000,
  attaches:  [],
  files:  null
}
```

Rest Controller

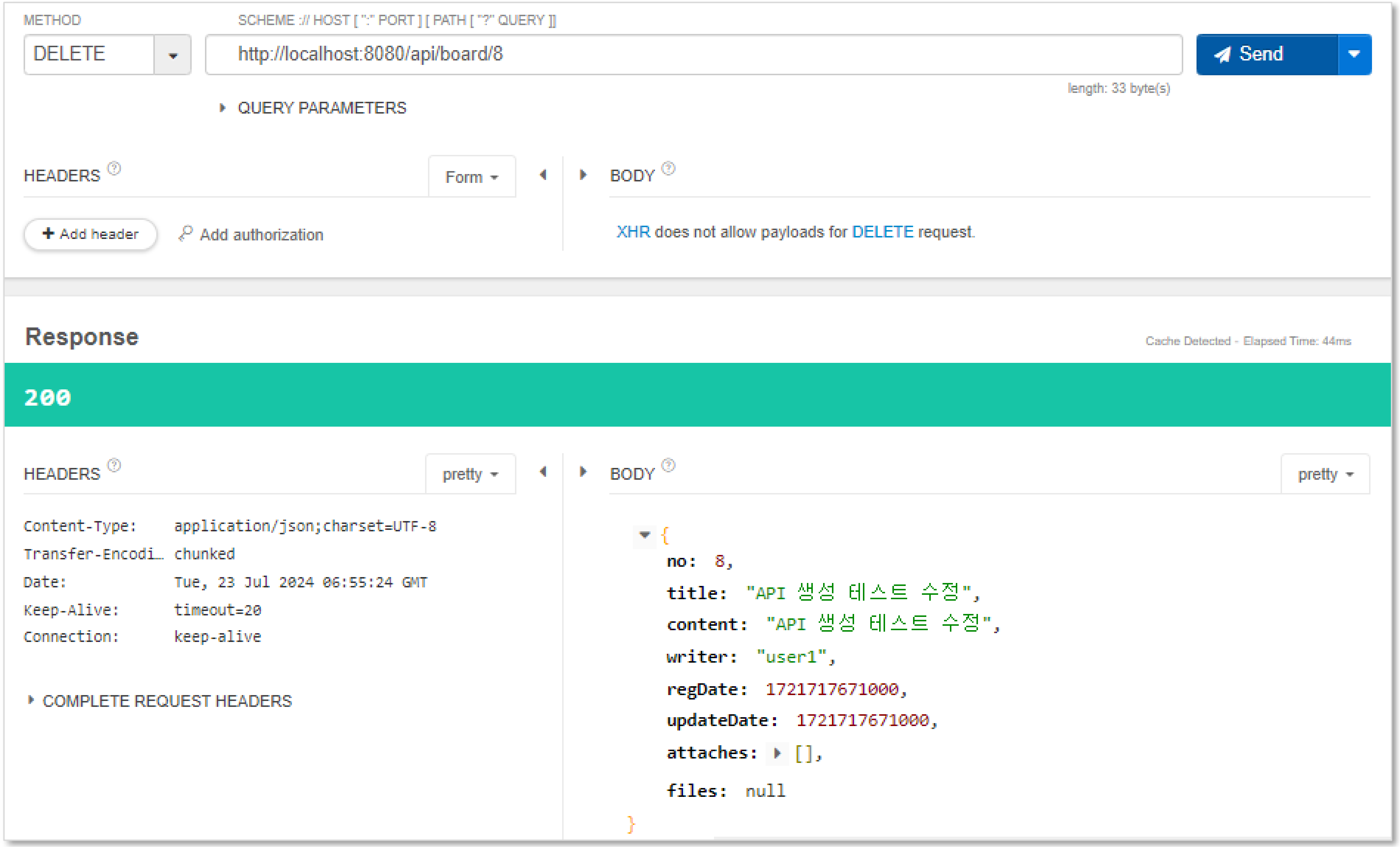
BoardController.java

```
@DeleteMapping("/{no}")
public ResponseEntity<?> delete(@PathVariable int id) {
    service.delete(id);
    return ResponseEntity.ok().build();
}
```

- DELETE :: http://localhost:8080/api/board/11

Rest Controller

- DELETE :: http://localhost:8080/api/board/8



```
http://localhost:8080/api/board/8
```

length: 33 byte(s)

XHR does not allow payloads for DELETE request.

Cache Detected - Elapsed Time: 44ms

200

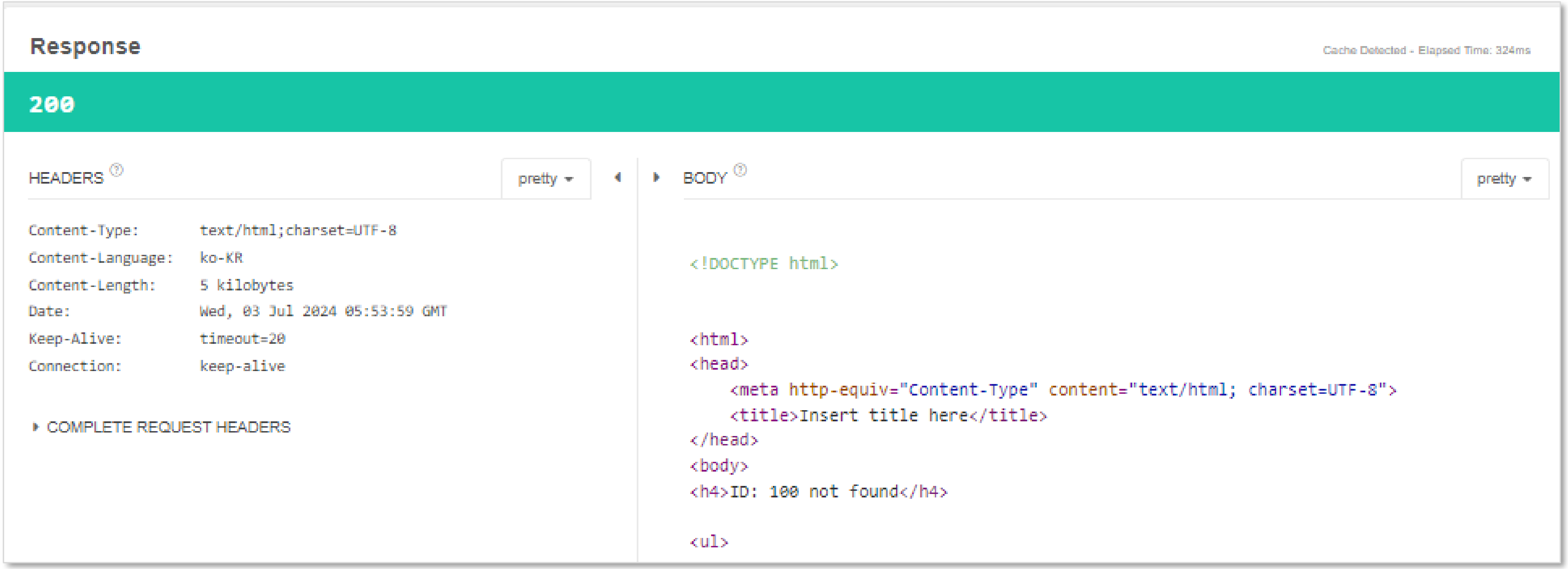
```
Content-Type:      application/json;charset=UTF-8
Transfer-Encodi…   chunked
Date:              Tue, 23 Jul 2024 06:55:24 GMT
Keep-Alive:        timeout=20
Connection:        keep-alive
```

```
{
  no: 8,
  title: "API 생성 테스트 수정",
  content: "API 생성 테스트 수정",
  writer: "user1",
  regDate: 1721717671000,
  updateDate: 1721717671000,
  attaches: ▸ [],
  files: null
}
```

Rest Controller

REST API 예외 처리

- GET::http://localhost:8080/api/board/100



Response

Cache Detected - Elapsed Time: 324ms

200

HEADERS | pretty | BODY | pretty

```
Content-Type:        text/html;charset=UTF-8
Content-Language:    ko-KR
Content-Length:      5 kilobytes
Date:                Wed, 03 Jul 2024 05:53:59 GMT
Keep-Alive:          timeout=20
Connection:          keep-alive
```

COMPLETE REQUEST HEADERS

```
<!DOCTYPE html>


<html>
<head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Insert title here</title>
</head>
<body>
<h4>ID: 100 not found</h4>

<ul>
```

- CommonExceptionAdvice가 에러를 처리함
  - jsp로 출력함

Rest Controller

@RestControllerAdvice

- AOP 기능을 이용하여 @RestController 처리과정에서 발생한 예외를 핸들링

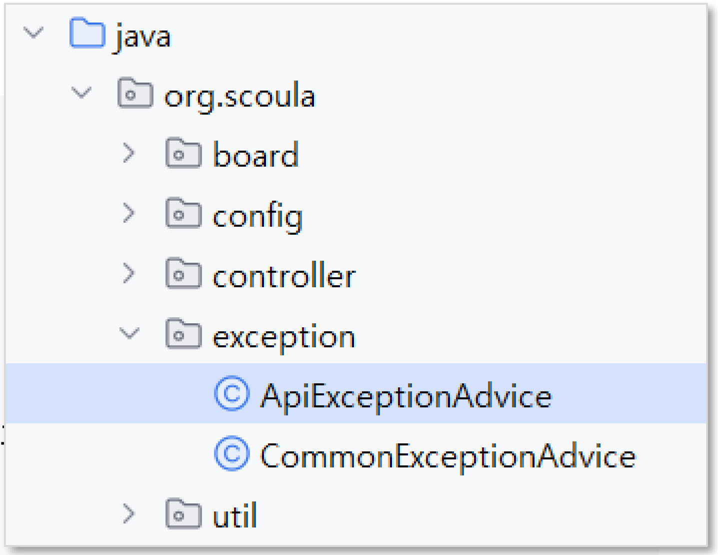
- 기본 구조

```
@RestControllerAdvice
public class ApiExceptionAdvice {

    @ExceptionHandler({처리할 예외 클래스.class, ... })
    public ResponseEntity<T> 핸들러(HttpServletRequest request, 예외클래스 e) {
        // ResponseEntity 구성 후 리턴

    }
    ...
}
```

Rest Controller

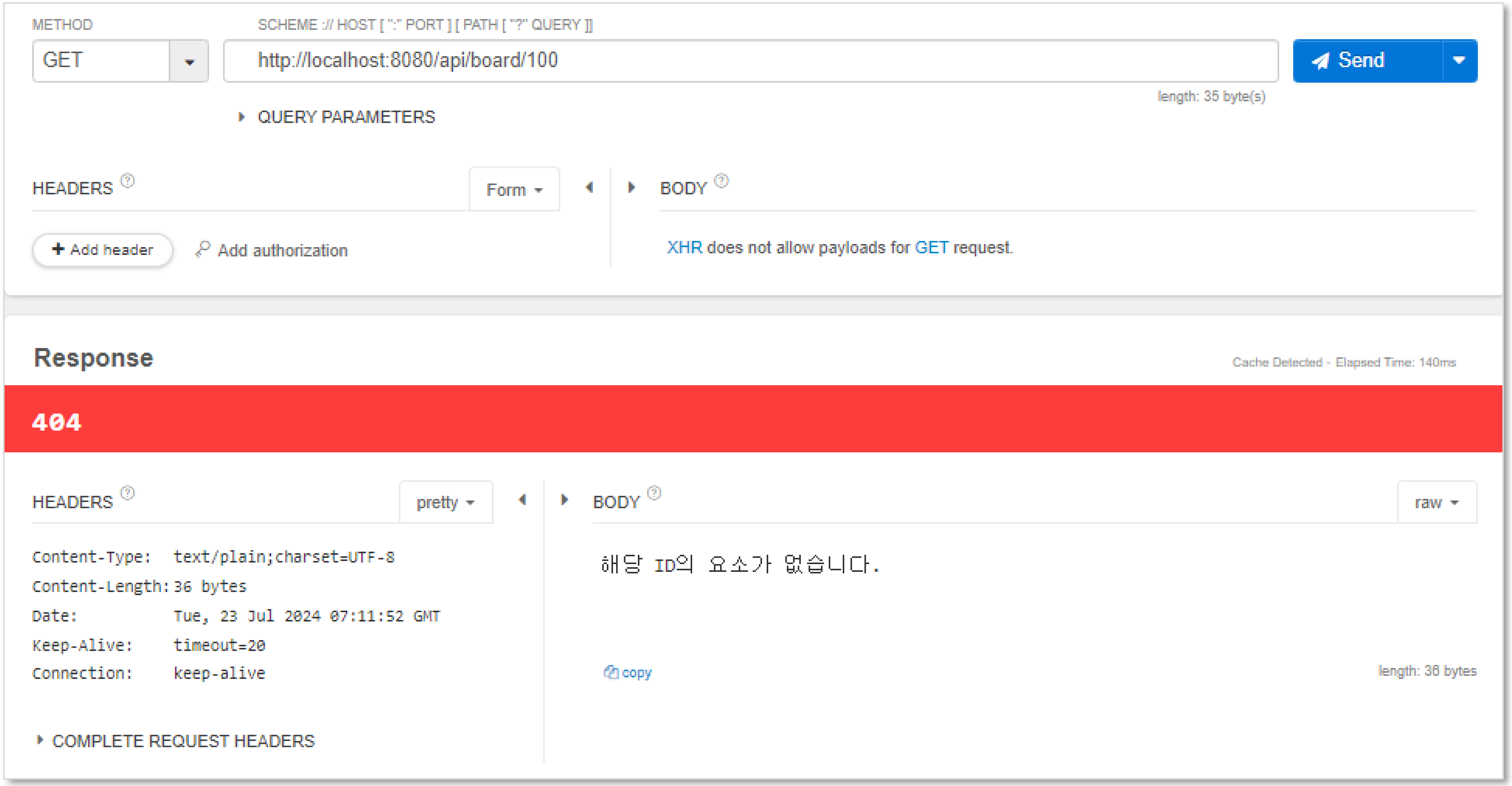
ApiExceptionAdvice.java

```
package org.scoula.exception;
…
@RestControllerAdvice
public class ApiExceptionAdvice {
    // 404 에러
    @ExceptionHandler(NoSuchElementException.class)
    protected ResponseEntity<String> handleIllegalArgumentException(NoSuchElementExcept
        return ResponseEntity
                .status(HttpStatus.NOT_FOUND)
                .header("Content-Type", "text/plain;charset=UTF-8")
                .body("해당 ID의 요소가 없습니다.");
    }

    // 500 에러
    @ExceptionHandler(Exception.class)
    protected ResponseEntity<String> handleException(Exception e) {
        return ResponseEntity
                .status(HttpStatus.INTERNAL_SERVER_ERROR)
                .header("Content-Type", "text/plain;charset=UTF-8")
                .body(e.getMessage());
    }
}
```



Rest Controller

- GET::http://localhost:8080/api/board/100



http://localhost:8080/api/board/100

length: 35 byte(s)

XHR does not allow payloads for GET request.

Cache Detected - Elapsed Time: 140ms

404

```
Content-Type:   text/plain;charset=UTF-8
Content-Length: 36 bytes
Date:           Tue, 23 Jul 2024 07:11:52 GMT
Keep-Alive:     timeout=20
Connection:     keep-alive
```

```
해당 ID의 요소가 없습니다.
```

length: 36 bytes