Test - Get Students

Get Students Endpoint

- Get a list of students as a JSON array

http://localhost:1500/

Web browser will send a GET request


```
[
  {
    "id": 10,
    "firstname": "David",
    "lastname": "Adams",
    "emailAddress": "david@luv2code.com",
    "studentGrades": {
      "mathGradeResults": [],
      "scienceGradeResults": [],
      "historyGradeResults": []
    },
    "fullName": "David Adams"
  },
  {
    "id": 11,
    "firstname": "John",
    "lastname": "Doe",
    "emailAddress": "john@luv2code.com",
    "studentGrades": {
      "mathGradeResults": [],
      "scienceGradeResults": [],
      "historyGradeResults": []
    },
    "fullName": "John Doe"
  },
  ...
]
```

GradebookController

```java
@RestController
public class GradebookController {

    @Autowired
    private StudentAndGradeService studentService;

    @Autowired
    private Gradebook gradebook;

    @RequestMapping(value = "/", method = RequestMethod.GET)
    public List<GradebookCollegeStudent> getStudents() {
        gradebook = studentService.getGradebook();
        return gradebook.getStudents();
    }

    ...
}
```


```
[
  {
    "id": 10,
    "firstname": "David",
    "lastname": "Adams",
    "emailAddress": "david@luv2code.com",
    "studentGrades": {
      "mathGradeResults": [],
      "scienceGradeResults": [],
      "historyGradeResults": []
    },
    "fullName": "David Adams"
  },
  {
    "id": 11,
    "firstname": "John",
    "lastname": "Doe",
    "emailAddress": "john@luv2code.com",
    "studentGrades": {
      "mathGradeResults": [],
      "scienceGradeResults": [],
      "historyGradeResults": []
    },
    "fullName": "John Doe"
  },
  ...
]
```

Verifying the HTTP Response

- How can we verify HTTP response?
  - status code
  - content type
  - JSON response body

Verifying HTTP Status and Content Type

```
import static org.springframework.test.web.servlet.result.MockMvcResultMatchers.content;
import static org.springframework.test.web.servlet.result.MockMvcResultMatchers.status;

...

@TestPropertySource("/application-test.properties")
@AutoConfigureMockMvc
@SpringBootTest
public class GradebookControllerTest {

   ...

   @Test
   public void getStudentsHttpRequest() throws Exception {

      mockMvc.perform(MockMvcRequestBuilders.get("/"))
             .andExpect(status().isOk())
             .andExpect(content().contentType(APPLICATION_JSON_UTF8));

   }

   ...

}
```

HTTP status of 200 (OK)

application/json

Verifying JSON Response Body

- How can we verify JSON response body?
  - Access specific JSON element (even for nested elements)
  - Size of the JSON array

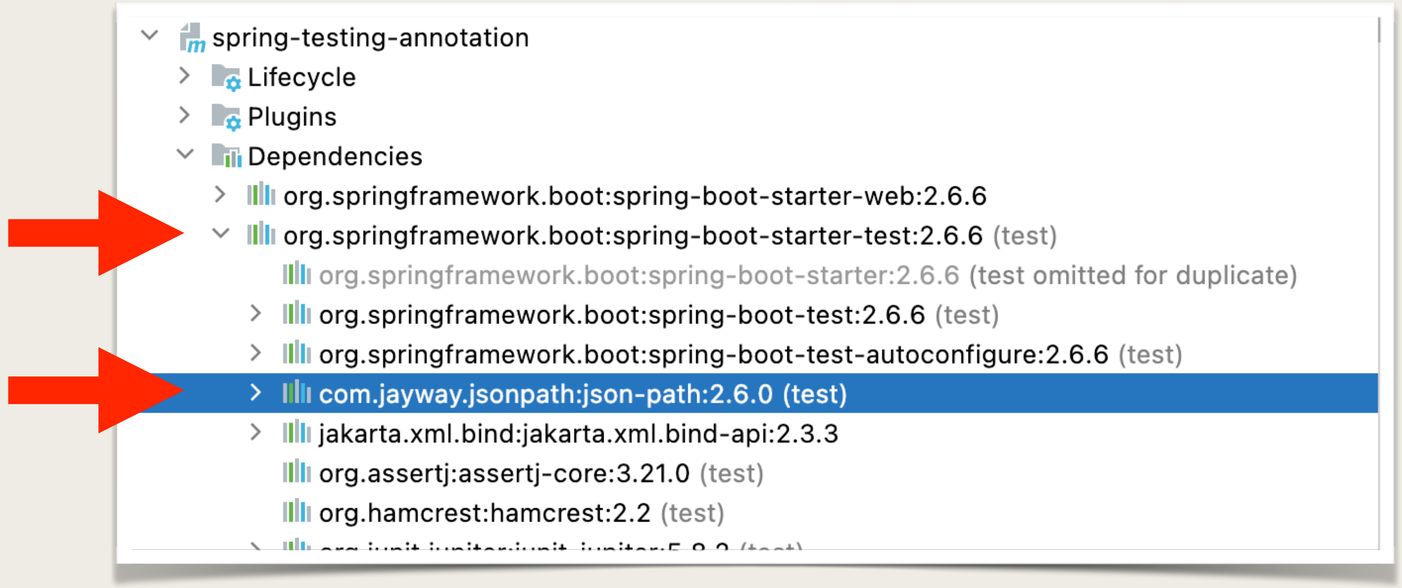
Solution: JsonPath

- **JsonPath** allows you to access elements of JSON
- Open-source project

https://github.com/json-path/JsonPath

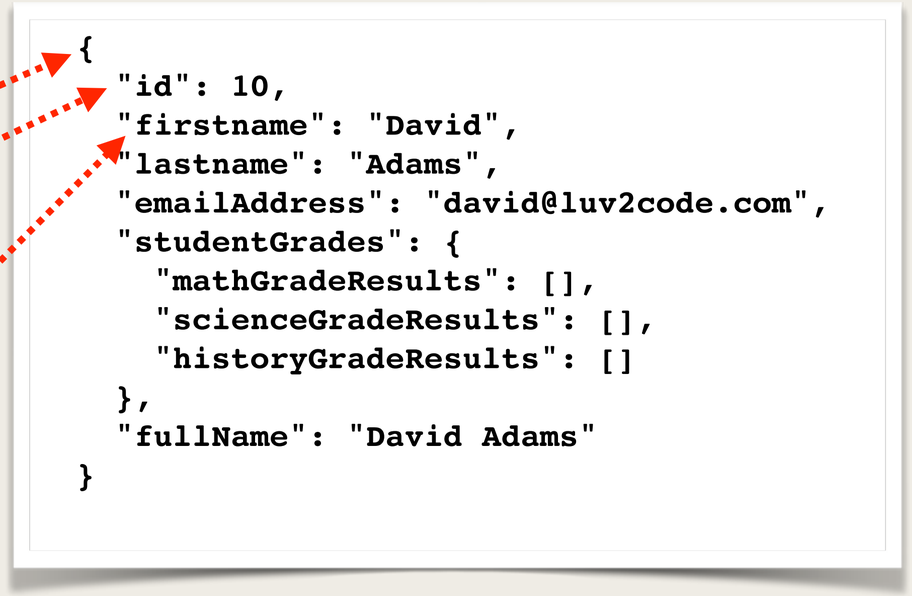
JsonPath support in Spring Boot Test

- Spring Boot Test starter includes support for JsonPath
- No need for you to manually add JsonPath dependency



JsonPath Examples

JsonPath	Result
`$`	The root element to query. Starts all path expressions
`$.id`	Access the **`id`** element of the JSON element
`$.firstname`	Access the **`firstname`** element of the JSON element
`...`	`...`



```
{
  "id": 10,
  "firstname": "David",
  "lastname": "Adams",
  "emailAddress": "david@luv2code.com",
  "studentGrades": {
    "mathGradeResults": [],
    "scienceGradeResults": [],
    "historyGradeResults": []
  },
  "fullName": "David Adams"
}
```

https://github.com/json-path/JsonPath

JsonPath - Verifying Array Size

```
import static org.springframework.test.web.servlet.result.MockMvcResultMatchers.jsonPath;
import static org.hamcrest.Matchers.hasSize;
...

@TestPropertySource("/application-test.properties")
@AutoConfigureMockMvc
@SpringBootTest
public class GradebookControllerTest {

   ...

   @Test
   public void getStudentsHttpRequest() throws Exception {

      mockMvc.perform(MockMvcRequestBuilders.get("/"))
             .andExpect(status().isOk())
             .andExpect(content().contentType(APPLICATION_JSON_UTF8))
             .andExpect(jsonPath("$", hasSize(2));

   }

   ...

}
```

Root element

Verify JSON array size is 2

```
[
  {
    "id": 10,
    "firstname": "David",
    "lastname": "Adams",
    "emailAddress": "david@luv2code.com",
    "studentGrades": {
      "mathGradeResults": [],
      "scienceGradeResults": [],
      "historyGradeResults": []
    },
    "fullName": "David Adams"
  },
  {
    "id": 11,
    "firstname": "John",
    "lastname": "Doe",
    "emailAddress": "john@luv2code.com",
    "studentGrades": {
      "mathGradeResults": [],
      "scienceGradeResults": [],
      "historyGradeResults": []
    },
    "fullName": "John Doe"
  }
]
```