Sum Up yang dipelajari pada Tutorial 5: Hal yang saya pelajari pada Tutorial 5 adalah beberapa hal sebagai berikut – yang pertama yaitu menambahkan *table* di dalam database yang sudah ada di phpmyadmin, mempopulasikan *table* tersebut, menambahkan *entity* baru, menambahkan *model*, dan hal lainnya.

Latihan 1: Ubah method selectAllStudents pada kelas StudentMapper agar halaman viewall menampilkan semua student beserta daftar kuliah yang diambil.

Pada file StudentMapper.java:

```
public interface StudentMapper {

	@Select("select npm, name, gpa from student where npm = #{npm}")
	@Results(value = {
			@Result(property = "npm", column = "npm"),
			@Result(property = "name", column = "name"),
			@Result(property = "gpa", column = "gpa"),
			@Result(property = "courses", column = "npm",
					javaType = List.class,
					many = @Many(select = "selectCourses"))
	})
	StudentModel selectStudent(@Param("npm") String npm);

	@Select("select npm, name, gpa from student")
	@Results(value = {
			@Result(property = "npm", column = "npm"),
			@Result(property = "name", column = "name"),
			@Result(property = "gpa", column = "gpa"),
			@Result(property = "courses", column = "npm",
					javaType = List.class,
					many = @Many(select = "selectCourses"))
	})
	List<StudentModel> selectAllStudents();

	@Insert("INSERT INTO student (npm, name, gpa) VALUES (#{npm}, #{name}, #{gpa})")
	void addStudent(StudentModel student);

	@Delete("DELETE FROM student WHERE npm=#{npm}")
	void deleteStudent(String npm);

	@Update("UPDATE student SET name=#{name}, gpa=#{gpa} WHERE npm=#{npm}")
	void updateStudent(StudentModel student);

	@Select("select course.id_course, name, credits " +
			"from studentcourse join course " +
			"on studentcourse.id_course = course.id_course " +
			"where studentcourse.npm = #{npm}")
	List<CourseModel> selectCourses(@Param("npm") String npm);
}
```

Melakukan perubahan pada method selectAllStudents, selectStudent. dan selectCourse untuk menampilkan hasil

Pada file viewall.html:

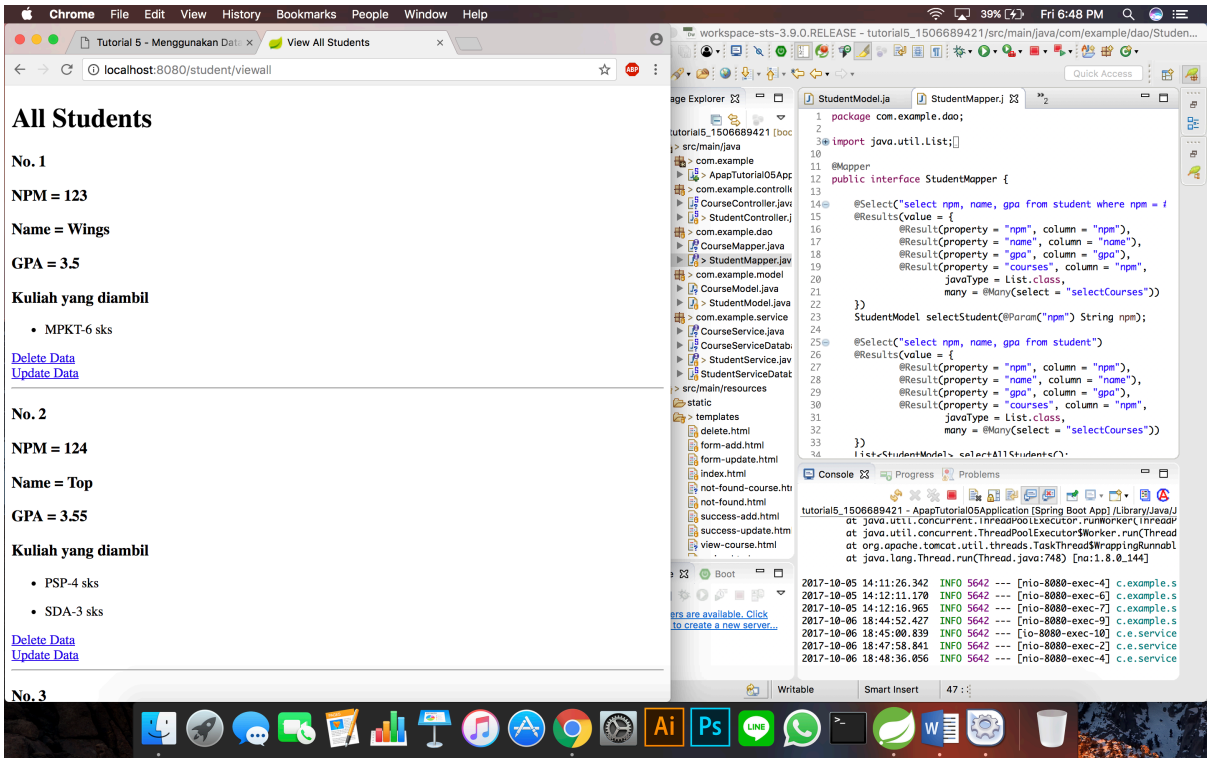
```
<div th:each="student,iterationStatus: ${students}">
            <h3 th:text="'No. ' + ${iterationStatus.count}">No. 1</h3>
            <h3 th:text="'NPM = ' + ${student.npm}">Student NPM</h3>
            <h3 th:text="'Name = ' + ${student.name}">Student Name</h3>
            <h3 th:text="'GPA = ' + ${student.gpa}">Student GPA</h3>

            <h3>Kuliah yang diambil</h3>
            <ul th:each="course,iterationStatus: ${student.courses}">
                  <li th:text="${course.name} + '-' + ${course.credits} + ' sks'">
                        Nama kuliah-X SKS</li>
            </ul>

            <a th:href="'/student/delete/' +${student.npm}">Delete Data</a><br />
            <a th:href="'/student/update/' +${student.npm}">Update Data</a><br />
            <hr />

      </div>
```

Apabila membuka halaman http://localhost:8080/student/viewall, akan muncul sebagai berikut:



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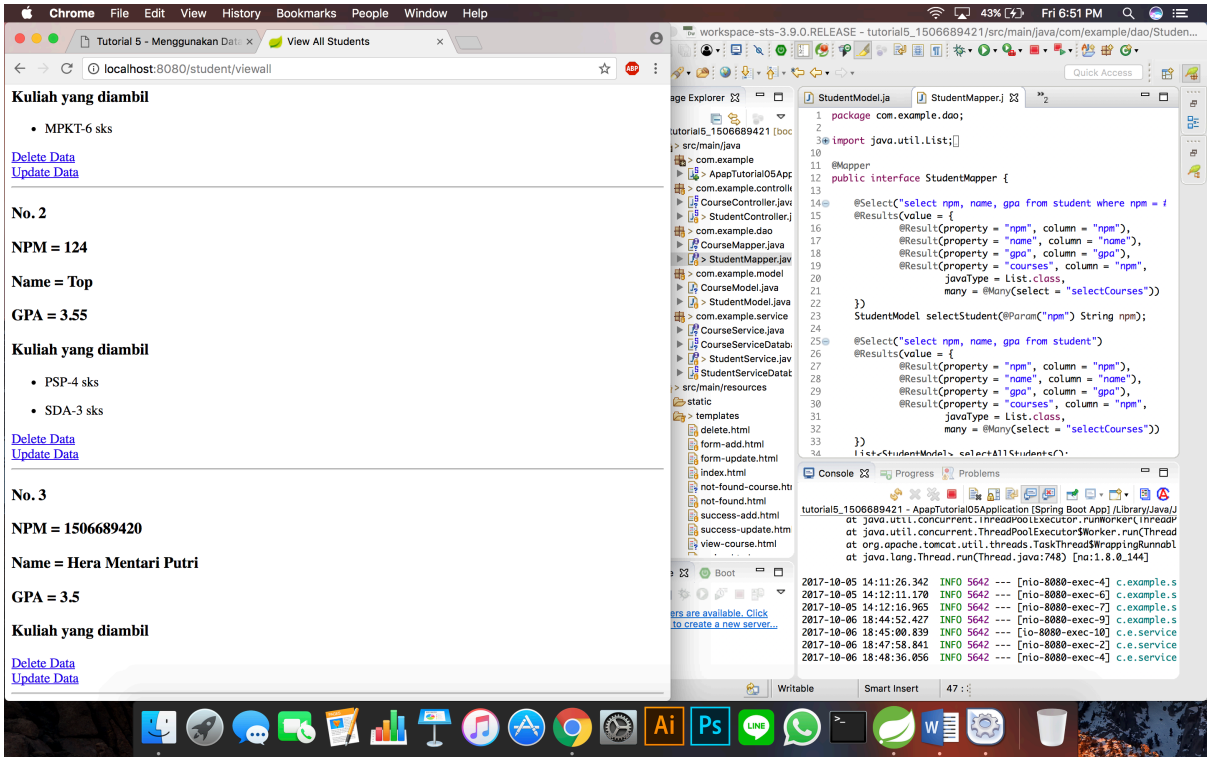


Latihan 2: Buatlah view pada halaman http://localhost:8080/course/view/{id} untuk Course sehingga dapat menampilkan data course beserta Student yang mengambil.

Pada file CourseController.java:

```
public class CourseController {
	@Autowired
	CourseService courseDAO;

	@RequestMapping("/course/view/{id}")
	public String viewPath(Model model, @PathVariable(value = "id") String id_course)
{
		CourseModel course = courseDAO.selectCourse(id_course);

		if (course != null) {
			model.addAttribute("course", course);
			return "view-course";
		} else {
			model.addAttribute("id_course", id_course);
			return "not-found-course";
		}
	}

	@RequestMapping("/course/viewall")
	public String view(Model model) {
		List<CourseModel> courses = courseDAO.selectAllCourses();
		model.addAttribute("courses", courses);

		return "viewall-courses";
	}


}
```

Pada file CourseMapper.java:

```
@Mapper
public interface CourseMapper {

	@Select("select id_course, name, credits from course where id_course =
#{id_course}")
	@Results(value = {
			@Result(property = "idCourse", column = "id_course"),
			@Result(property = "name", column = "name"),
			@Result(property = "credits", column = "credits"),
			@Result(property = "students", column = "id_course",
					javaType = List.class,
					many = @Many(select = "selectStudents"))
	})
	CourseModel selectCourse(@Param("id_course") String id_course);

	@Select("select id_course, name, credits from course")
	@Results(value = {
			@Result(property = "idCourse", column = "id_course"),
			@Result(property = "name", column = "name"),
			@Result(property = "credits", column = "credits"),
			@Result(property = "students", column = "id_course",
					javaType = List.class,
					many = @Many(select = "selectStudents"))
	})
	List<CourseModel> selectAllCourses();

	@Select("select student.npm as npm, name, gpa " +
			"from studentcourse join student " +
			"on studentcourse.npm = student.npm " +
			"where studentcourse.id_course = #{id_course}")
	List<StudentModel> selectStudents(@Param("id_course") String id_course);

}
```

Pada file CourseService.java:

```
public interface CourseService
{
    CourseModel selectCourse (String id_course);

    List<CourseModel> selectAllCourses ();
}
```

Pada file CourseServiceDatabase.java:

```
public class CourseServiceDatabase implements CourseService
{
    @Autowired
    private CourseMapper courseMapper;


    @Override
    public CourseModel selectCourse (String id_course)
    {
        log.info ("select course with id_course {}", id_course);
        return courseMapper.selectCourse (id_course);
    }
```

```
    @Override
    public List<CourseModel> selectAllCourses ()
    {
        log.info ("select all courses");
        return courseMapper.selectAllCourses ();
    }

}
```

Saya juga membuat halaman untuk menampilkannya dengan sebagai berikut:

Pada file not-found-course.html:

```
<!DOCTYPE html>
<html xmlns:th="http://www.thymeleaf.org">
    <head>
        <title>Course not found</title>
    </head>
    <body>
       <h1>Course not found</h1>
       <h3 th:text="'Course = ' + ${id_course}">Course ID</h3>
    </body>
</html>
```

Pada file view-course.html:

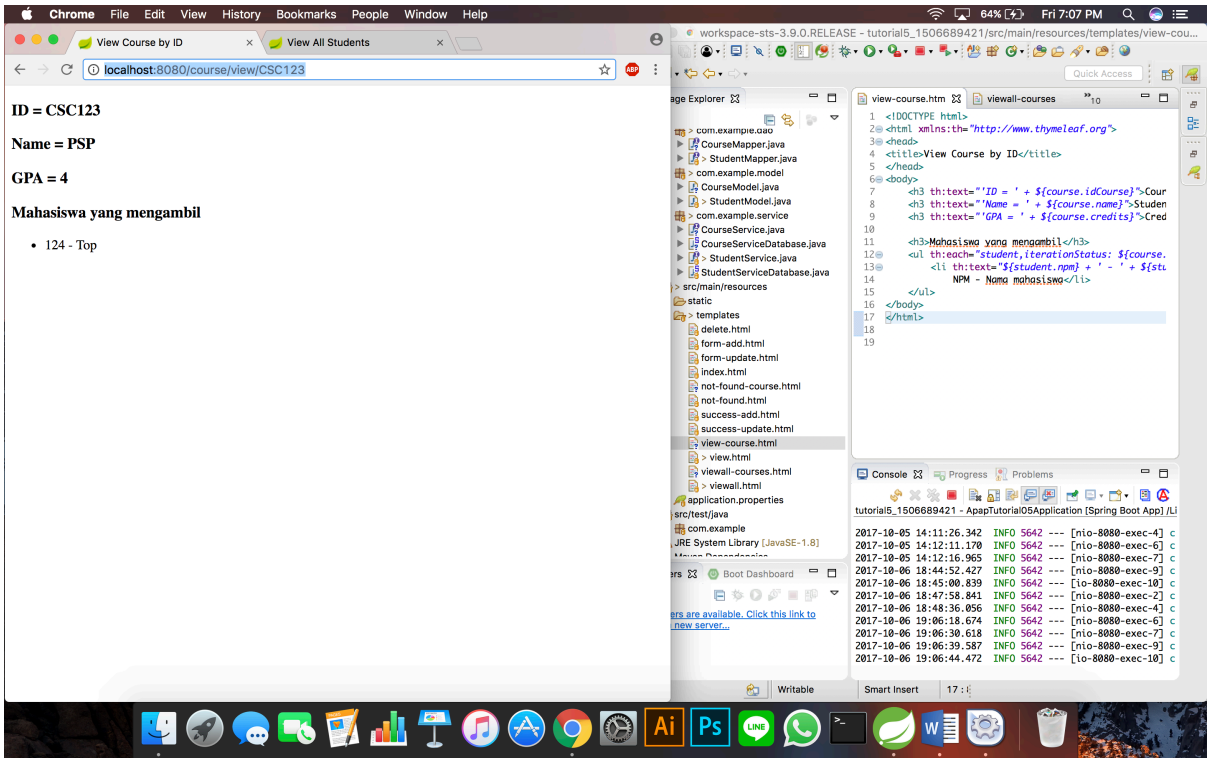
```
<!DOCTYPE html>
<html xmlns:th="http://www.thymeleaf.org">
<head>
<title>View Course by ID</title>
</head>
<body>
       <h3 th:text="'ID = ' + ${course.idCourse}">Course ID</h3>
       <h3 th:text="'Name = ' + ${course.name}">Student Name</h3>
       <h3 th:text="'GPA = ' + ${course.credits}">Credits</h3>

       <h3>Mahasiswa yang mengambil</h3>
       <ul th:each="student,iterationStatus: ${course.students}">
              <li th:text="${student.npm} + ' - ' + ${student.name}">
                     NPM - Nama mahasiswa</li>
       </ul>
</body>
</html>
```

Pada file viewall-course.html:

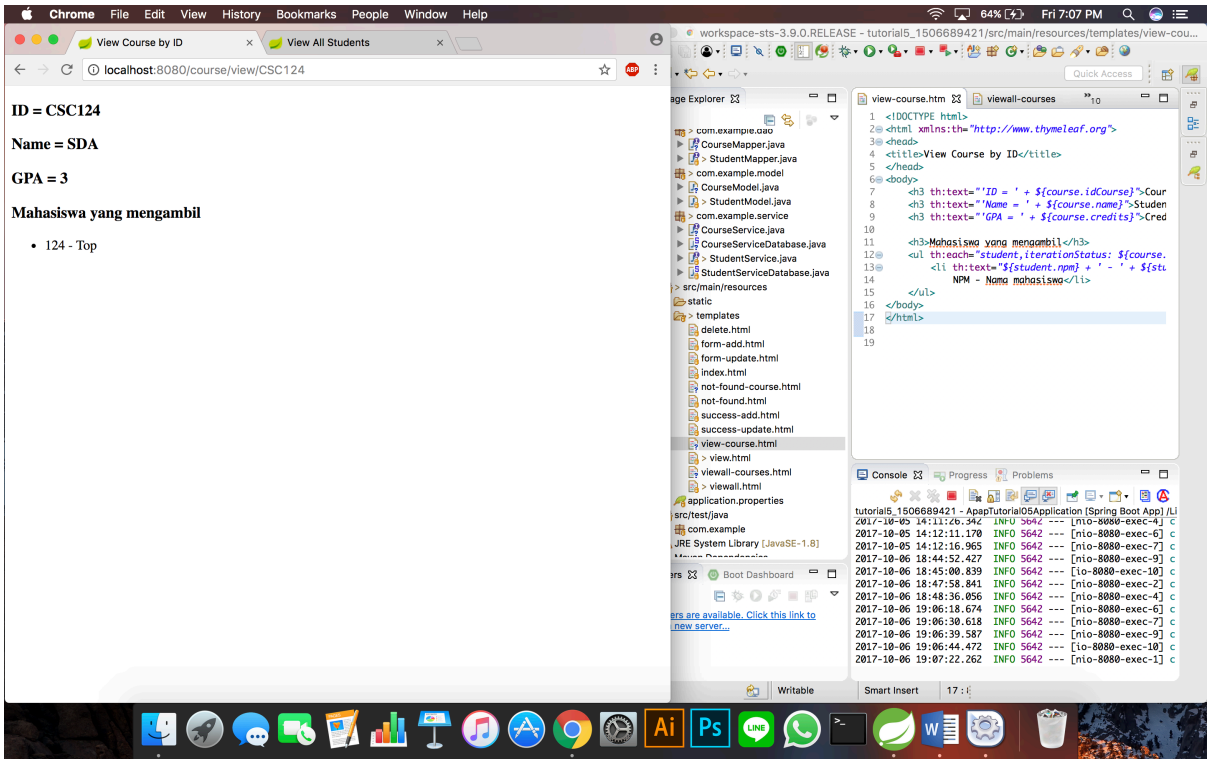
```
<!DOCTYPE html>
<html xmlns:th="http://www.thymeleaf.org">
<head>
<title>View All Courses</title>
</head>
<body>
       <h1>All Courses</h1>

       <div th:each="course,iterationStatus: ${courses}">
              <h3 th:text="'No. ' + ${iterationStatus.count}">No. 1</h3>
```

```
            <h3 th:text="'id course = ' + ${course.idCourse}">Course ID</h3>
            <h3 th:text="'Name = ' + ${course.name}">Course Name</h3>
            <h3 th:text="'Credits = ' + ${course.credits}">Course Credits</h3>

            <h3>Mahasiswa yang mengambil</h3>
            <ul th:each="student,iterationStatus: ${course.students}">
                  <li th:text="${student.npm}+ ' - ' + ${student.name}">
                        NPM - Nama mahasiswa</li>
            </ul>
            <hr />

      </div>
</body>
</html>
```

Apabila membuka laman http://localhost:8080/course/view/CSC123:



Apabila membuka laman http://localhost:8080/course/view/CSC124:



Lalu, pengguna juga dapat melihat seluruh *course* dan siapa yang mengambilnya dengan membuka laman http://localhost:8080/course/viewall: