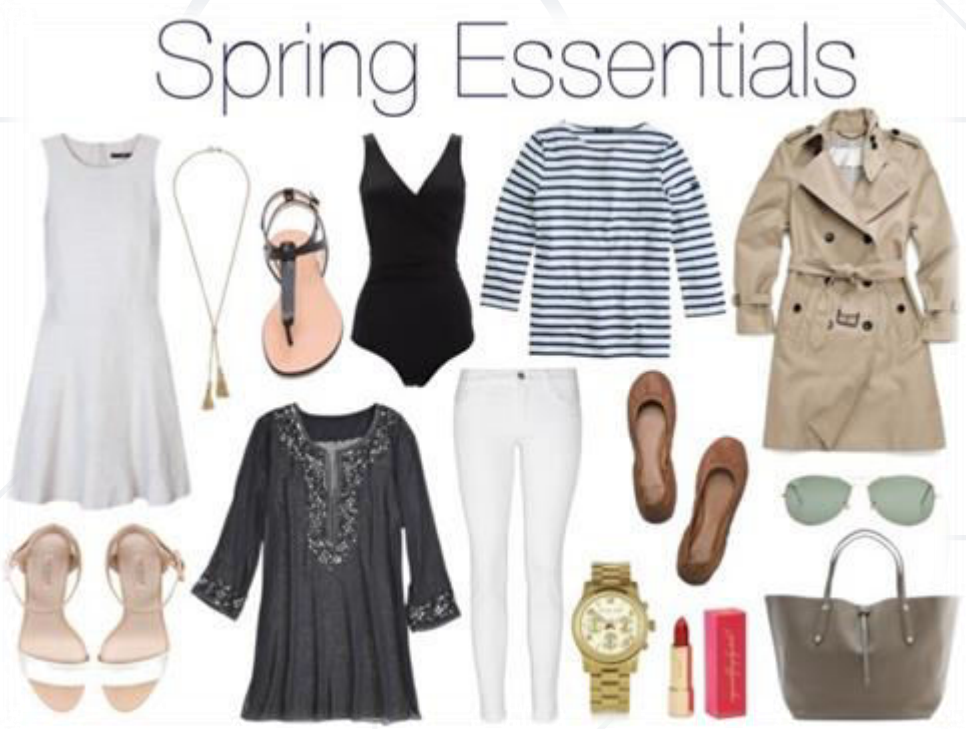
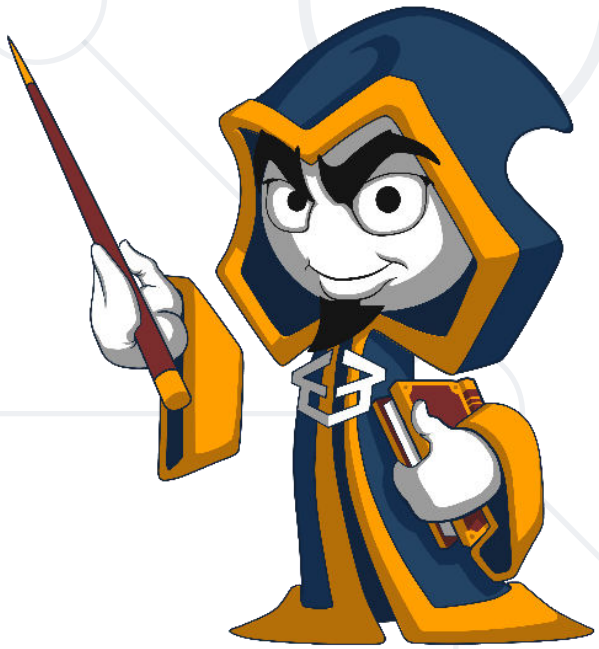
Java MVC Frameworks

Spring Essentials. Thymeleaf and Controllers





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Thymeleaf

The Templating Engine

What is Thymeleaf?

- Thymeleaf is a view engine used in Spring
- It allows us to:
  - Use variables in our views
  - Execute operations on our variables
  - Iterate over collections
  - Make our views dynamical

How to use Thymeleaf?

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- Use Spring Initializr to import Thymeleaf, or use this dependency in your pom.xml:

```
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-thymeleaf</artifactId>
</dependency>
```

- Define the Thymeleaf library in your html file:

```
<html xmlns="http://www.w3.org/1999/xhtml"
                      xmlns:th="http://www.thymeleaf.org">
```

Change Thymeleaf Version

- You also need to change the Thymeleaf version in your pom.xml:

```
<properties>
  <thymeleaf.version>
    3.0.9.RELEASE
  </thymeleaf.version>
  <thymeleaf-layout-dialect.version>
    2.2.0
  </thymeleaf-layout-dialect.version>
</properties>
```

Thymeleaf Tags and Attributes

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- All Thymeleaf tags and attributes begin with th: by default
- Example of Thymeleaf attribute:

```
<p th:text="Example"></p>
```

- Example of Thymeleaf tag(element processor):

```
<th:block>
  ...
</th:block>
```

- th:block is an attribute container that disappears in the HTML

Thymeleaf Standard Expressions

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- Variable Expressions

```
${...}
```

- Selection Expressions

```
*{...}
```

- Link (URL) Expressions

```
@{...}
```

- Fragment Expressions

```
~{...}
```

Thymeleaf Variable Expressions

- Variable Expressions are executed on the context variables

```
${...}
```

- Examples:

```
${session.user.name}
```

```
${title}
```

```
${game.id}
```

Thymeleaf Link Expressions

- Link Expressions are used to build URLs

```
@{...}
```

- Example:

```
<a th:href="@{/register}">Register</a>
```

- You can also pass query string parameters:

```
<a th:href="@{/details(id=${game.id})}">Details</a>
```

- Create dynamic URLs

```
<a th:href="@{/games/{id}/edit(id=${game.id})}">Edit</a>
```

- In Thymeleaf you can create almost normal HTML forms:

```
<form th:action="@{/user}" th:method="post">
    <input type="number" name="id"/>
    <input type="text" name="name"/>
    <input type="submit"/>
</form>
```

- You can have a controller that will accept an object of given type:

```
@PostMapping("/user")
public ModelAndView register(@ModelAttribute User user)
{ ... }
```

Spring Controllers

Annotations, IoC Container

Spring Controllers

- Defined with the @Controller annotation:

```
@Controller
public class HomeController {
…
}
```

- Controllers can contain multiple actions on different routes.

Controller Actions

- Annotated with with @RequestMapping(…)

```
@RequestMapping("/home")
public String home() {
   return "home-view";
}
```

- Or

```
@RequestMapping("/home")
public ModelAndView home(ModelAndView mav) {
   mav.setViewName("home-view");
   return mav;
}
```

Request Mapping

- Problem when using @RequestMapping is that it accepts all types of request methods (get, post, put, delete, head, patch…)

- Execute only on GET requests :

```
@RequestMapping(value="/home", method=RequestMethod.GET)
public String home() {
   return "home-view";
}
```

Get Mapping

- Easier way to create route for a GET request:

```
@GetMapping("/home")
public String home() {
   return "home-view";
}
```

- This is alias for RequestMapping with method GET

Post Mapping

- Similar to the GetMapping there is also an alias for RequestMapping with method POST:

```
@PostMapping("/register")
public String register() {
   …
}
```

- Similar annotations exist for all other types of request methods

Passing Attributes to View

- Passing a string to the view:

```
@GetMapping("/")
public String welcome(Model model) {
  model.addAttribute("name", "Pesho");

  return "welcome";
}
```

- The Model object will be automatically passed to the view as co ntext variables and the attributes can be accessed from Thymeleaf using the Expression syntax - `${name}`

Working with the Session

- The session will be injected from the IoC container when called:

```
@GetMapping("/")
public String home(HttpSession httpSession) {
  …
  httpSession.setAttribute("id", 2);
  …
}
```

- Later the session attributes can be accessed from Thymeleaf usi ng the expression syntax and the #session object:

```
${session.id}
```

Request Parameters

- Getting a parameter from the query string:

```
@GetMapping("/details")
public String details(@RequestParam("id") Long id) {
   …
}
```

- @RequestParam can also be used to get POST parameters

```
@PostMapping("/register")
public String register(@RequestParam("name") String name)
{ … }
```

Request Parameters with Default Value

- Getting a parameter from the query string:

```
@GetMapping("/comment")
public String comment(@RequestParam(name="author",
defaultValue = "Annonymous") String author)
{ … }
```

- Making parameter optional:

```
@GetMapping("/search")
public String search(@RequestParam(name="sort", required
= false) String sort)
{ … }
```

Form Objects

- Spring will automatically try to fill objects with a form data

```
@PostMapping("/register")
public String register(@ModelAttribute UserDTO userDto) {
   …
}
```

- The input field names must be the same as the object field names

Redirecting

- Redirecting after POST request:

```
@PostMapping("/register")
public String register(@ModelAttribute UserDTO userDto) {
  …
  return "redirect:/login";
}
```

Redirecting with Parameters

- Redirecting with query string parameters

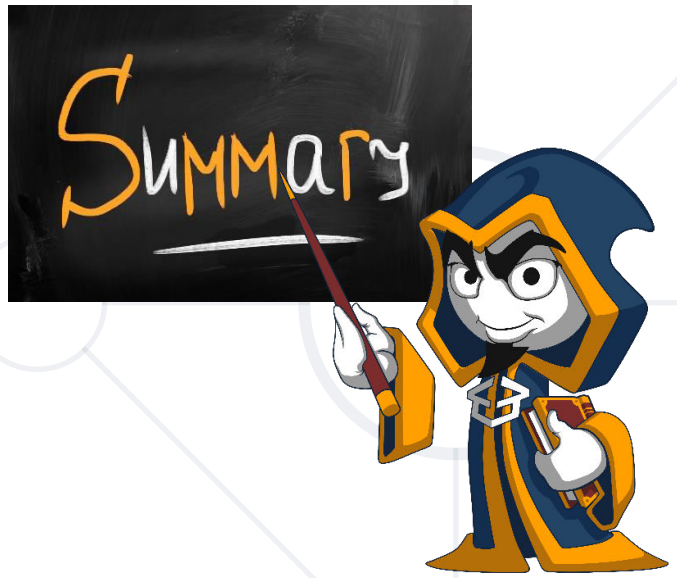
```
@PostMapping("/register")
public String register(@ModelAttribute UserDTO userDto,
RedirectAttributes redirectAttributes) {

  redirectAttributes.addAttribute("errorId", 3);
  return "redirect:/login";
}
```

Redirecting with Attributes

- Keeping objects after redirect

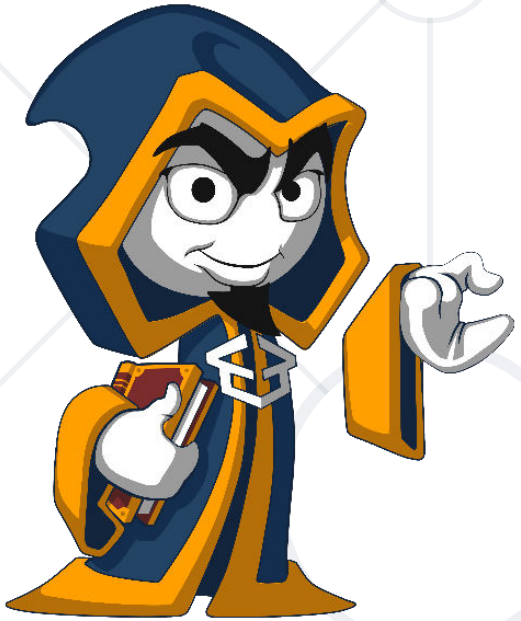
```
@PostMapping("/register")
public String register(@ModelAttribute UserDTO userDto,
RedirectAttributes redirectAttributes) {
  …
  redirectAttributes.addFlashAttribute("userDto",
userDto);

  return "redirect:/register";
}
```

Summary



- Thymeleaf is a powerful view engine
  - You can work with variables and helper Objects
  - You can easily create forms
- The Spring Controllers:
  - You can create routings on actions and controllers
  - You have access to the HttpRequest, HttpResponse, HttpSession and others
  - You can redirect between actions

Questions?



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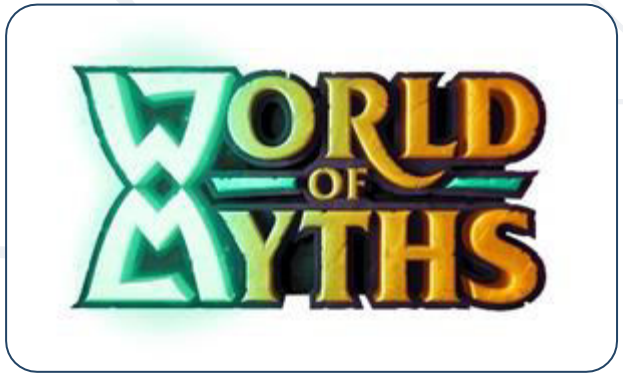

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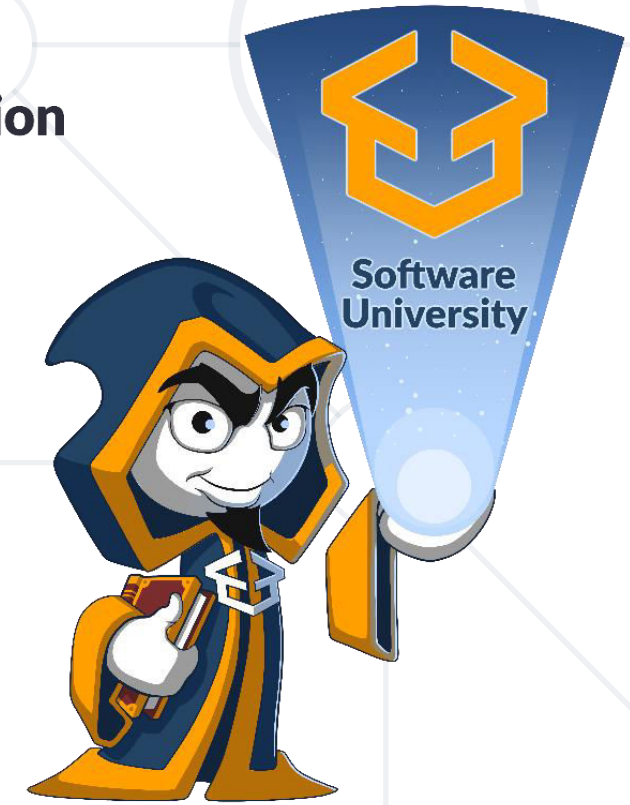

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