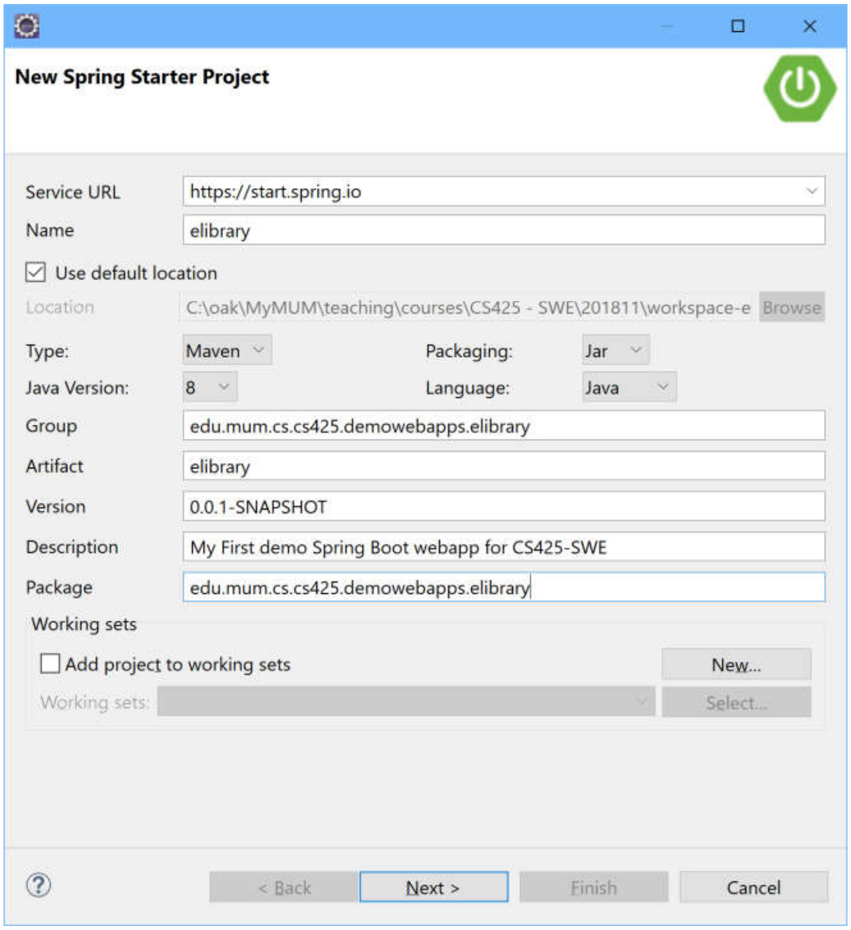
eLibrary - My First Spring Boot Web Application

To create your first Spring Boot Webapp (named, eLibrary), do the following steps:

1. If you do not already have one, Create a new empty folder (directory) to serve as your project workspace (e.g. name it, workspace-eclipse).
2. Launch-open your Eclipse IDE (or some other preferred IDE tool of your choice, such as STS (Spring Tool Suite) on to the workspace.
3. If using Eclipse and if your Eclipse IDE does not already have it, install the **Spring Tools 4** plugin for Eclipse, by doing the following:
   - 3.1. In Eclipse, Select the Help -> Eclipse Marketplace menu item
   - 3.2. In the "Find" textfield under the Search tab, enter the text - "Spring Tools 4" and click on the "Go" button, to search for the plugin.
   - 3.3. Click on the "Install" button for the Spring Tools 4 plugin item found, in the search result. And when the plugin is successfully installed, restart Eclipse when prompted.
4. In Eclipse or STS, click on File -> New menu and select, "Spring Starter Project".
5. Fill-in the project details as shown below and click "Next":

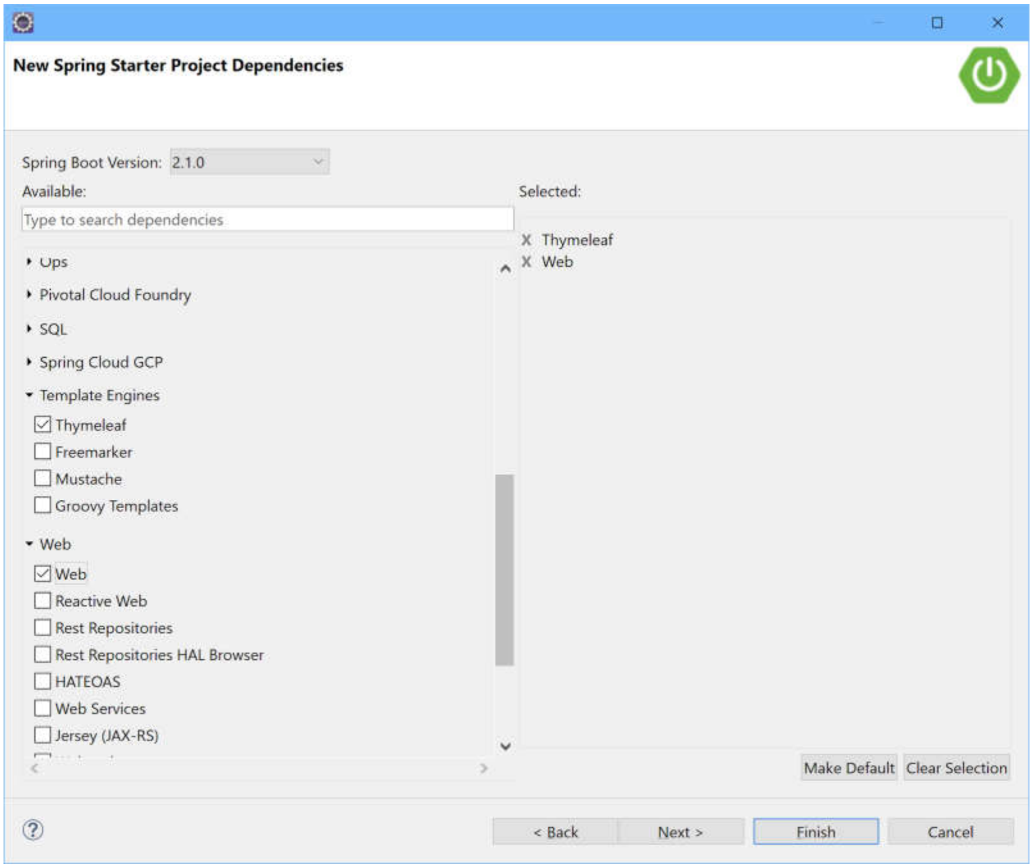


New Spring Starter Project

Service URL: https://start.spring.io
Name: elibrary
☑ Use default location
Location: C:\oak\MyMUM\teaching\courses\CS425 - SWE\201811\workspace-e
Type: Maven
Packaging: Jar
Java Version: 8
Language: Java
Group: edu.mum.cs.cs425.demowebapps.elibrary
Artifact: elibrary
Version: 0.0.1-SNAPSHOT
Description: My First demo Spring Boot webapp for CS425-SWE
Package: edu.mum.cs.cs425.demowebapps.elibrary

Working sets
☐ Add project to working sets
Working sets:

6. For the project Dependencies, select the 2 items (Web and Thymeleaf), as shown below:



New Spring Starter Project Dependencies

Spring Boot Version: 2.1.0

Available:

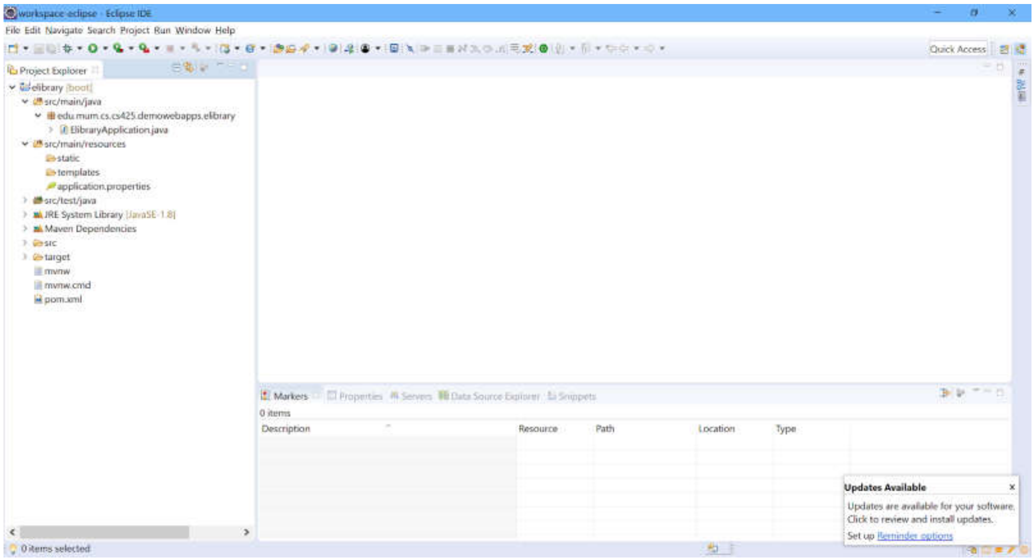
Type to search dependencies

- Ops
- Pivotal Cloud Foundry
- SQL
- Spring Cloud GCP
- Template Engines
  - ☑ Thymeleaf
  - □ Freemarker
  - □ Mustache
  - □ Groovy Templates
- Web
  - ☑ Web
  - □ Reactive Web
  - □ Rest Repositories
  - □ Rest Repositories HAL Browser
  - □ HATEOAS
  - □ Web Services
  - □ Jersey (JAX-RS)

Selected:

X Thymeleaf
X Web

7. On clicking "Finish", the generated Spring Boot webapp project should show-up within your Eclipse as can be seen below:



workspace-eclipse - Eclipse IDE

```
elibrary [boot]
  src/main/java
    edu.mum.cs.cs425.demowebapps.elibrary
      ElibraryApplication.java
  src/main/resources
    static
    templates
    application.properties
  src/test/java
  JRE System Library [JavaSE-1.8]
  Maven Dependencies
  src
  target
  mvnw
  mvnw.cmd
  pom.xml
```

0 items

Description	Resource	Path	Location	Type

Updates Available

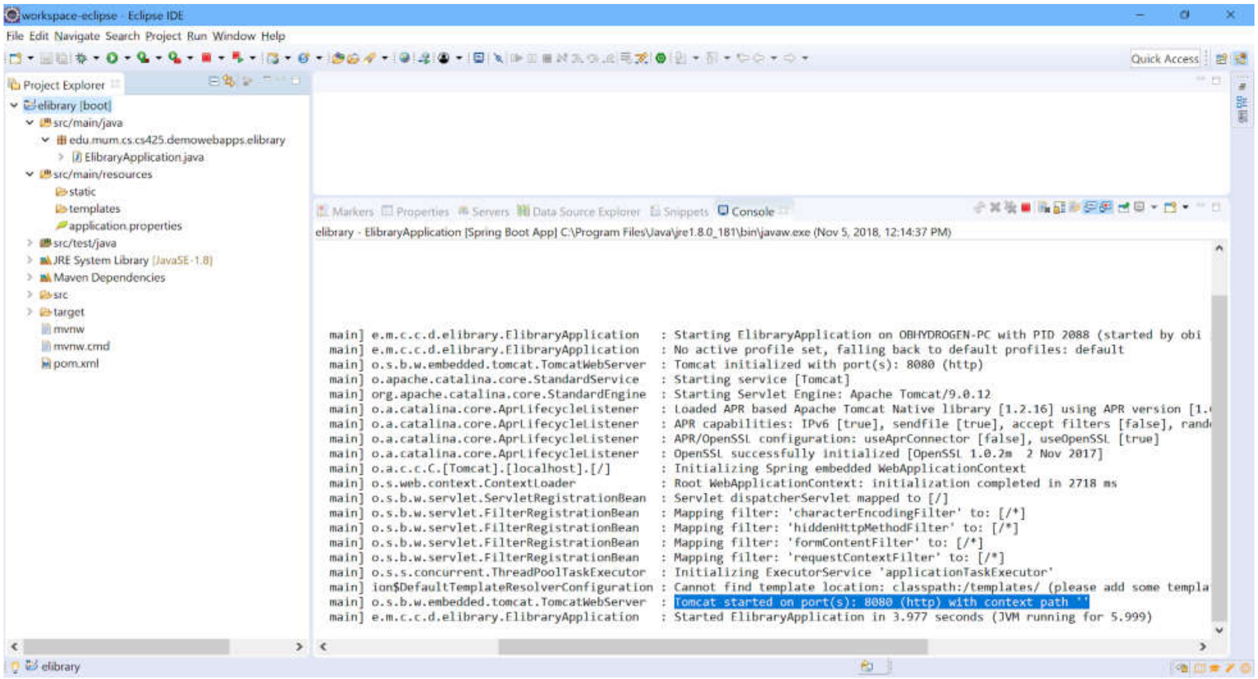
Updates are available for your software. Click to review and install updates.

Set up Reminder options

0 items selected

8. To run (i.e. execute) the project in Eclipse, simply right-click on the project, go to "Run As" and select "Spring Boot App".

9. The project is then executed and the embedded tomcat engine is started on the default port number, 8080, as shown below:



elibrary - ElibraryApplication [Spring Boot App] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (Nov 5, 2018, 12:14:37 PM)

```
main] e.m.c.c.d.elibrary.ElibraryApplication    : Starting ElibraryApplication on OBHYDROGEN-PC with PID 2088 (started by obi
main] e.m.c.c.d.elibrary.ElibraryApplication    : No active profile set, falling back to default profiles: default
main] o.s.b.w.embedded.tomcat.TomcatWebServer   : Tomcat initialized with port(s): 8080 (http)
main] o.apache.catalina.core.StandardService    : Starting service [Tomcat]
main] org.apache.catalina.core.StandardEngine   : Starting Servlet Engine: Apache Tomcat/9.0.12
main] o.a.catalina.core.AprLifecycleListener    : Loaded APR based Apache Tomcat Native library [1.2.16] using APR version [1.
main] o.a.catalina.core.AprLifecycleListener    : APR capabilities: IPv6 [true], sendfile [true], accept filters [false], rand
main] o.a.catalina.core.AprLifecycleListener    : APR/OpenSSL configuration: useAprConnector [false], useOpenSSL [true]
main] o.a.catalina.core.AprLifecycleListener    : OpenSSL successfully initialized [OpenSSL 1.0.2m  2 Nov 2017]
main] o.a.c.c.C.[Tomcat].[localhost].[/]        : Initializing Spring embedded WebApplicationContext
main] o.s.web.context.ContextLoader             : Root WebApplicationContext: initialization completed in 2718 ms
main] o.s.b.w.servlet.ServletRegistrationBean   : Servlet dispatcherServlet mapped to [/]
main] o.s.b.w.servlet.FilterRegistrationBean    : Mapping filter: 'characterEncodingFilter' to: [/*]
main] o.s.b.w.servlet.FilterRegistrationBean    : Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
main] o.s.b.w.servlet.FilterRegistrationBean    : Mapping filter: 'formContentFilter' to: [/*]
main] o.s.b.w.servlet.FilterRegistrationBean    : Mapping filter: 'requestContextFilter' to: [/*]
main] o.s.s.concurrent.ThreadPoolTaskExecutor   : Initializing ExecutorService 'applicationTaskExecutor'
main] ion$DefaultTemplateResolverConfiguration : Cannot find template location: classpath:/templates/ (please add some templa
main] o.s.b.w.embedded.tomcat.TomcatWebServer   : Tomcat started on port(s): 8080 (http) with context path ''
main] e.m.c.c.d.elibrary.ElibraryApplication    : Started ElibraryApplication in 3.977 seconds (JVM running for 5.999)
```

10. However, opening a web browser and navigating to the url - http://localhost:8080/, produces a Whitelabel Error page with status code, 404. This is because there is no resource (e.g. a view template resource, like a webpage) available at that url, yet. Therefore, to enable a webpage (e.g. our eLibrary web application's homepage) to be displayed, do the following:

10.1. In Eclipse IDE, go to the Project Explorer, expand/open the "src/main/resources" folder.

10.2. Right-click on the "templates" sub-folder and select "New -> Folder" and add a new folder named, say, home.

10.3. Right-click on this new "home" folder and select "New -> Other" and expand the Web folder and select "HTML File" to create/add a new HTML file. Click "Next" and name the file, index.html. Click "Next" again, select the "HTML 5" template and click "Finish".

10.4. Select and delete the entire generated HTML markup content of the file and replace it with the html markup content provided below and save the file:

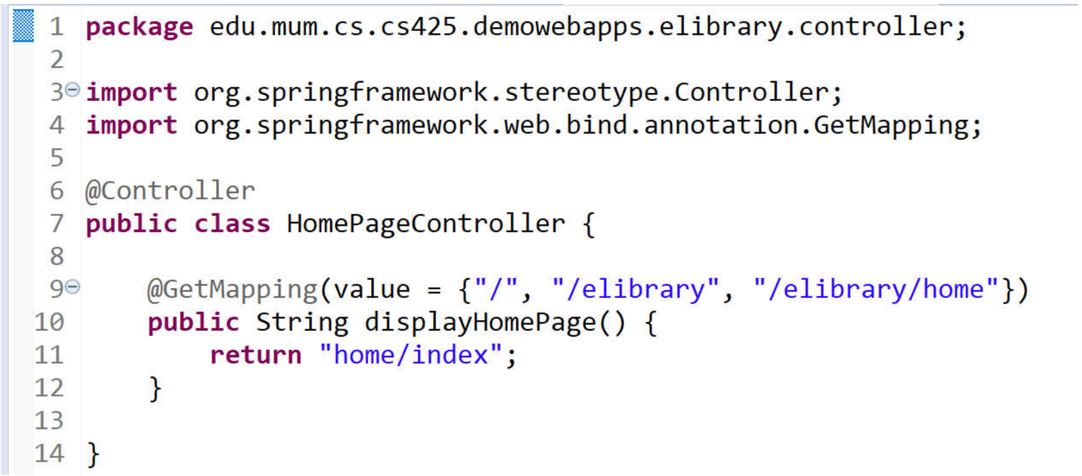
```
<!DOCTYPE html>
<html xmlns:th="http://www.thymeleaf.org">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta http-equiv="X-UA-Compatible" content="ie=edge">
  <meta name="description" content="">
  <meta name="author" content="O. Kalu">
  <link rel="icon" href="favicon.ico">
  <link href="https://stackpath.bootstrapcdn.com/bootswatch/4.1.2/cerulean/bootstrap.min.css" rel="stylesheet"
integrity="sha384-EmRcsPP774S9MOi4ywB+JXUWjYnBdyInMzG2XsC5siZEUpexqxOMJW358dCYEjPu"
crossorigin="anonymous">
```

```
    <link rel="stylesheet" type="text/css" th:href="@{/css/master.css}">
    <title>eLibrary - a demo spring boot webapp</title>
</head>
<body>
    <nav class="navbar navbar-expand-lg navbar-dark bg-primary">
        <a style="padding-right: 2em;" class="navbar-brand" href="/elibrary/home">eLibrary : : : a basic demo
webapp using Spring Boot</a>
        <!--<span style="color: #ffffff;"> &nbsp; | &nbsp;</span>-->
        <button class="navbar-toggler" type="button" data-toggle="collapse" data-target="#navbarColor01"
aria-controls="navbarColor01" aria-expanded="false" aria-label="Toggle navigation">
            <span class="navbar-toggler-icon"></span>
        </button>

        <div class="collapse navbar-collapse" id="navbarColor01">
            <ul class="navbar-nav mr-auto">
                <li class="nav-item" style="border-left: white 1px solid; padding-left: 2em; padding-right: 2em;">
                    <a class="nav-link" href="/elibrary/book/list">Browse Books</a>
                </li>
            </ul>
            <form class="form-inline my-2 my-lg-0">
                <!--<input class="form-control mr-sm-2" type="text" placeholder="Search">-->
                <!--<a style="color: #ffffff; margin-right: 0em;" class="nav-link" href="#">John Doe</a>-->
                <!--<a href="#" class="btn btn-secondary">Sign In</a>-->
            </form>
        </div>
    </nav>

    <p>&nbsp;</p>
    <div class="container">
        <h3>Welcome to the eLibrary Management system (eLMS)</h3>
        <hr/>
        <div style="font-size: 1em">
            To browse and manage the <a href="/elibrary/book/list">catalogue of Books</a>, please first make sure
to read the
            instructions and key points provided below. And then click the
            appropriate menu item, located on the menu-bar above.<br/><br/>

            Lorem Ipsum is simply dummy text of the printing and typesetting
            industry. Lorem Ipsum has been the industry's standard dummy text
            ever since the 1500s, when an unknown printer took a galley of type
            and scrambled it to make a type specimen book. It has survived not
            only five centuries, but also the leap into electronic typesetting,
            remaining essentially unchanged. It was popularised in the 1960s with
            the release of Letraset sheets containing Lorem Ipsum passages, and
            more recently with desktop publishing software like Aldus PageMaker
            including versions of Lorem Ipsum.
        </div>
    </div>

<!--     <footer class="footer">
        <div class="container">
            <span class="text-muted">O. Kalu : : : CS425-SWE</span><span style="float:right;"
class="text-muted">&copy; November 2018</span>
        </div>
    </footer> -->

    <!-- Bootstrap core JavaScript
    ==================================================== -->
    <!-- Placed at the end of the document so the pages load faster -->
    <script src="https://code.jquery.com/jquery-3.3.1.slim.min.js"
integrity="sha384-q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi6jizo"
crossorigin="anonymous"></script>
    <script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.3/umd/popper.min.js"
integrity="sha384-ZMP7rVo3mIykV+2+9J3UJ46jBk0WLaUAdn689aCwoqbBJiSnjAK/l8WvCWPIPm49"
crossorigin="anonymous"></script>
    <script src="https://stackpath.bootstrapcdn.com/bootstrap/4.1.1/js/bootstrap.min.js"
integrity="sha384-smHYKdLADwkXOn1EmN1qk/HfnUcbVRZyYmZ4qpPea6sjB/pTJ0euyQp0Mk8ck+5T"
crossorigin="anonymous"></script>
</body>
</html>
```

10.5. In the Project Explorer, expand/open the "src/main/java" folder; right-click on the package named, "edu.mum.cs.cs425.demowebapps.elibrary" and select "New -> Package" and create a new (sub)package named, edu.mum.cs.cs425.demowebapps.elibrary.controller.

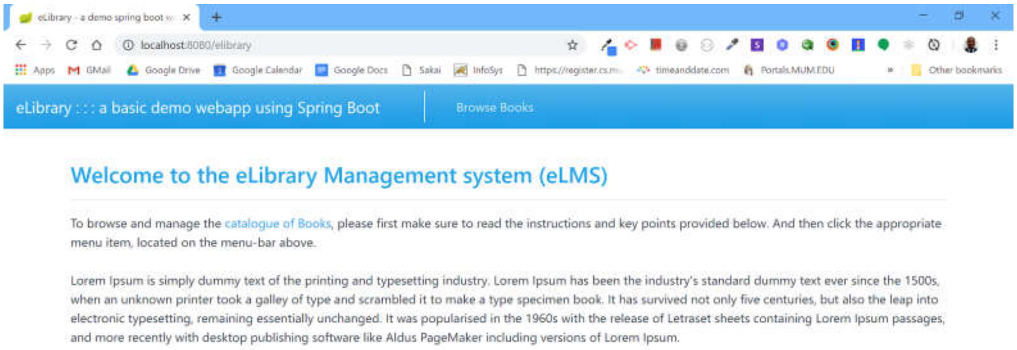
10.6. Right-click on the "controller" (sub)package, select "New -> Class" and add a Java class named, HomePageController and click "Finish".

10.7. Add the couple of import statements, annotations and the one method (named, displayHomePage) into the HomePageController class, as shown below and save the file:



```java
package edu.mum.cs.cs425.demowebapps.elibrary.controller;

import org.springframework.stereotype.Controller;
import org.springframework.web.bind.annotation.GetMapping;

@Controller
public class HomePageController {

    @GetMapping(value = {"/", "/elibrary", "/elibrary/home"})
    public String displayHomePage() {
        return "home/index";
    }

}
```

10.8. Now, re-run the project and when the embedded tomcat engine has started, simply access the elibrary webapp by opening your browser to the url, http://localhost:8080/ (or http://localhost:8080/elibrary or http://localhost:8080/elibrary/home). The elibrary web application's home page should be displayed as shown below:



Welcome to the eLibrary Management system (eLMS)

To browse and manage the catalogue of Books, please first make sure to read the instructions and key points provided below. And then click the appropriate menu item, located on the menu-bar above.

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

11. If you got this home page displayed, then Congratulations! You've successfully created a web application using Spring Framework 5.x.x, with Spring Boot 2.x.x and Thymeleaf 3.x.x.
12. The End!!!