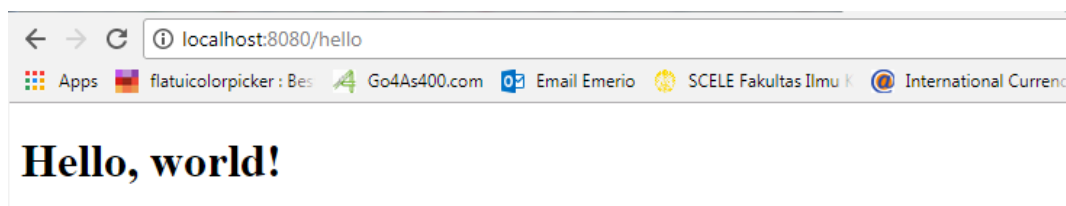


Latihan Project Hello World

Spring Boot merupakan salah satu jenis framework dari Spring. Spring Boot itu sendiri adalah sebuah web framework menggunakan Java. Dimana framework menggunakan Java banyak digunakan untuk membuat aplikasi berskala besar. Pada lab tutorial 2 saya belajar tentang bagaimana cara menampilkan HelloWorld. Selain itu belajar untuk menggunakan metode RequestMapping yang berfungsi untuk pemanggilan url melalui browser dengan akses localhost:8080/. Lalu mempelajari penggunaan request parameter yang berfungsi untuk menambahkan parameter pada request url. Dalam tutorial ini juga mempelajari Path variable yang berfungsi untuk membuat memetakan request parameter kedalam segmen URL.



1. Ganti baris tersebut menjadi `@RequestMapping("/hello123")`

```

@Controller
public class PageController {

    @RequestMapping("/hello123")
    public String index ()
    {
        return "hello";
    }
}

```

```

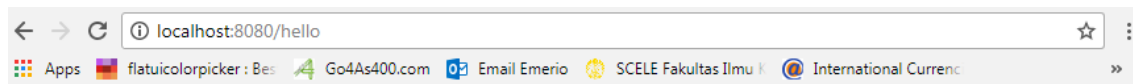
2018-02-24 13:27:15.064 INFO 4764 --- [ restartedMain] com.example.demo.HelloWorldApplication : Starting HelloWorldApplicat
2018-02-24 13:27:15.065 INFO 4764 --- [ restartedMain] com.example.demo.HelloWorldApplication : No active profile set, fall
2018-02-24 13:27:15.266 INFO 4764 --- [ restartedMain] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework
2018-02-24 13:27:16.412 INFO 4764 --- [ restartedMain] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with por
2018-02-24 13:27:16.422 INFO 4764 --- [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2018-02-24 13:27:16.425 INFO 4764 --- [ restartedMain] org.apache.catalina.core.StandardEngine : Starting Servlet Engine: Ap
2018-02-24 13:27:16.515 INFO 4764 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedde
2018-02-24 13:27:16.515 INFO 4764 --- [ost-startStop-1] o.s.web.context.ContextLoader : Root WebApplicationContext:
2018-02-24 13:27:16.673 INFO 4764 --- [ost-startStop-1] o.s.b.w.servlet.ServletRegistrationBean : Mapping servlet: 'dispatche
2018-02-24 13:27:16.678 INFO 4764 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean : Mapping filter: 'characterE
2018-02-24 13:27:16.679 INFO 4764 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean : Mapping filter: 'hiddenHttp
2018-02-24 13:27:16.679 INFO 4764 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean : Mapping filter: 'httpPutFor
2018-02-24 13:27:16.679 INFO 4764 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean : Mapping filter: 'requestCon
2018-02-24 13:27:16.956 INFO 4764 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvi
2018-02-24 13:27:17.005 INFO 4764 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "[/hello123]" onto
2018-02-24 13:27:17.009 INFO 4764 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "[[/error]]" onto pu
2018-02-24 13:27:17.009 INFO 4764 --- [ restartedMain] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "[[/error]],produces=
2018-02-24 13:27:17.037 INFO 4764 --- [ restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/webjars/*

```

Pertanyaan: Apakah compile error? Tidak.

Jika tidak stop Spring Boot yang sedang berjalan, run kembali dan buka localhost:8080/hello apa yang terjadi?

Jawaban : Menjadi error dikarenakan `@RequestMapping` nya adalah `/hello123` sedangkan yang di URL hanya `/hello`



Whitelabel Error Page

This application has no explicit mapping for /error, so you are seeing this as a fallback.

Sat Feb 24 13:28:53 ICT 2018

There was an unexpected error (type=Not Found, status=404).

No message available

Kembalikan RequestMapping menjadi /hello

2. Ganti nama method index() dengan nama method hello()

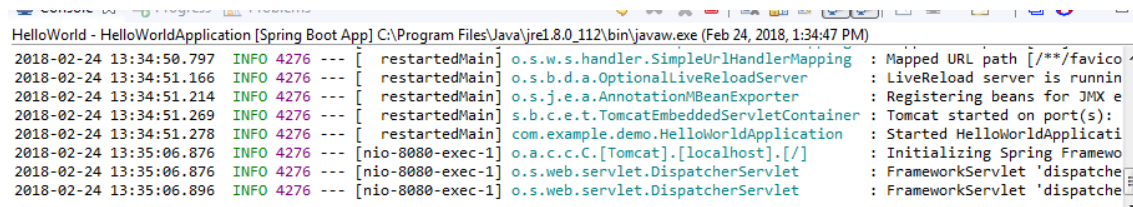
```
import org.springframework.web.bind.annotation.RequestMapping;

@Controller
public class PageController {

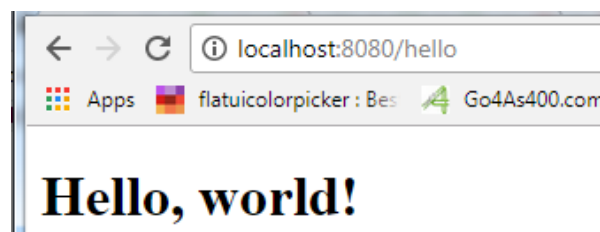
    @RequestMapping("/hello")
    public String hello()
    {
        return "hello";
    }
}
```

Pertanyaan: Apakah compile error?

Jawaban : Tidak



Jika tidak, Stop Spring Boot yang sedang berjalan, run kembali dan buka localhost:8080/hello apakah page hello sebelumnya masih muncul? Kembalikan nama method menjadi index()



3. Ganti string return type menjadi return "hello123";

```
@Controller
public class PageController {

    @RequestMapping("/hello")
    public String index()
    {
        return "hello123";
    }
}
```

Pertanyaan: Apakah compile error?

Jawaban : Tidak

```
HelloWorld - HelloWorldApplication [Spring Boot App] C:\Program Files\Java\jre1.8.0_112\bin\javaw.exe (Feb 24, 2018, 1:38:05 PM)
2018-02-24 13:38:08.669 INFO 5888 --- [restartedMain] s.w.s.m.a.RequestMappingHandlerMapping : mapped {[/hello]} onto pu
2018-02-24 13:38:08.674 INFO 5888 --- [restartedMain] s.w.s.m.a.RequestMappingHandlerMapping : Mapped "{[/error]}" onto pu
2018-02-24 13:38:08.675 INFO 5888 --- [restartedMain] s.w.s.m.a.RequestMappingHandlerMapping : Mapped "{[/error],produces=
2018-02-24 13:38:08.705 INFO 5888 --- [restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/webjars/*
2018-02-24 13:38:08.706 INFO 5888 --- [restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**] onto
2018-02-24 13:38:08.744 INFO 5888 --- [restartedMain] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**/favico
2018-02-24 13:38:09.101 INFO 5888 --- [restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is runnin
2018-02-24 13:38:09.148 INFO 5888 --- [restartedMain] o.s.j.e.a.AnnotationMBeanExporter : Registering beans for JMX e
2018-02-24 13:38:09.200 INFO 5888 --- [restartedMain] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s):
2018-02-24 13:38:09.208 INFO 5888 --- [restartedMain] com.example.demo.HelloWorldApplication : Started HelloWorldApplicati
2018-02-24 13:38:20.169 INFO 5888 --- [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring Framewo
2018-02-24 13:38:20.169 INFO 5888 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : FrameworkServlet 'dispatche
2018-02-24 13:38:20.190 INFO 5888 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : FrameworkServlet 'dispatche
```

Jika tidak, Stop Spring Boot yang sedang berjalan, run kembali dan buka localhost:8080/hello apakah page hello sebelumnya masih muncul?

Jawaban : Terjadi error karena tidak ada path /hello123 yang dipanggil

localhost:8080/hello

Whitelabel Error Page

This application has no explicit mapping for /error, so you are seeing this as a fallback.

Sat Feb 24 13:41:28 ICT 2018
 There was an unexpected error (type=Internal Server Error, status=500).
 Error resolving template "hello123", template might not exist or might not be accessible by any of the configured Template Resolvers

```
2018-02-24 13:41:28.312 INFO 6272 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet : FrameworkServlet 'dispatch
2018-02-24 13:41:28.406 ERROR 6272 --- [nio-8080-exec-1] org.thymeleaf.TemplateEngine : [THYMELEAF][http-nio-8080-1
2018-02-24 13:41:28.466 ERROR 6272 --- [nio-8080-exec-1] o.a.c.c.C.[.][.][dispatcherServlet] : Servlet.service() for serv

org.thymeleaf.exceptions.TemplateInputException: Error resolving template "hello123", template might not exist or might not be
    at org.thymeleaf.TemplateRepository.getTemplate(TemplateRepository.java:246) ~[thymeleaf-2.1.6.RELEASE.jar:2.1.6.RELEASE]
    at org.thymeleaf.TemplateEngine.process(TemplateEngine.java:1104) ~[thymeleaf-2.1.6.RELEASE.jar:2.1.6.RELEASE]
    at org.thymeleaf.TemplateEngine.process(TemplateEngine.java:1060) ~[thymeleaf-2.1.6.RELEASE.jar:2.1.6.RELEASE]
    at org.thymeleaf.TemplateEngine.process(TemplateEngine.java:1011) ~[thymeleaf-2.1.6.RELEASE.jar:2.1.6.RELEASE]
    at org.thymeleaf.spring4.view.ThymeleafView.renderFragment(ThymeleafView.java:335) ~[thymeleaf-spring4-2.1.6.RELEASE.jar:2.1.6.RELEASE]
    at org.thymeleaf.spring4.view.ThymeleafView.render(ThymeleafView.java:190) ~[thymeleaf-spring4-2.1.6.RELEASE.jar:2.1.6.RELEASE]
    at org.springframework.web.servlet.DispatcherServlet.render(DispatcherServlet.java:1286) ~[spring-webmvc-4.3.14.RELEASE.jar:4.3.14.RELEASE]
    at org.springframework.web.servlet.DispatcherServlet.processDispatchResult(DispatcherServlet.java:1041) ~[spring-webmvc-4.3.14.RELEASE.jar:4.3.14.RELEASE]
    at org.springframework.web.servlet.DispatcherServlet.doDispatch(DispatcherServlet.java:984) ~[spring-webmvc-4.3.14.RELEASE.jar:4.3.14.RELEASE]
    at org.springframework.web.servlet.DispatcherServlet.doService(DispatcherServlet.java:901) ~[spring-webmvc-4.3.14.RELEASE.jar:4.3.14.RELEASE]
    at org.springframework.web.servlet.FrameworkServlet.processRequest(FrameworkServlet.java:970) ~[spring-webmvc-4.3.14.RELEASE.jar:4.3.14.RELEASE]
    at org.springframework.web.servlet.FrameworkServlet.doGet(FrameworkServlet.java:861) ~[spring-webmvc-4.3.14.RELEASE.jar:4.3.14.RELEASE]
    at javax.servlet.http.HttpServlet.service(HttpServlet.java:635) ~[tomcat-embed-core-8.5.27.jar:8.5.27]
    at org.springframework.web.servlet.FrameworkServlet.service(FrameworkServlet.java:846) ~[spring-webmvc-4.3.14.RELEASE.jar:4.3.14.RELEASE]
    at javax.servlet.http.HttpServlet.service(HttpServlet.java:742) ~[tomcat-embed-core-8.5.27.jar:8.5.27]
    at org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:231) ~[tomcat-embed-core-8.5.27.jar:8.5.27]
```

Kembalikan return type menjadi "hello"

Pertanyaan: Menandakan apakah String yang di-return tersebut?

Jawaban : Return tersebut memanggil method dengan nama String dan dikirimkan ke view atau file html nya

Latihan Request Parameter

1. Ubah nilai anotasi RequestMapping dari "/greeting" menjadi "/hello/greeting"

Buka **localhost:8080/hello/greeting?name=chanek**

Pertanyaan: apakah hasilnya?

Jawaban : Tampilan tetap sama dan tidak terjadi error karena @requestmapping sesuai dengan url yang dipanggil

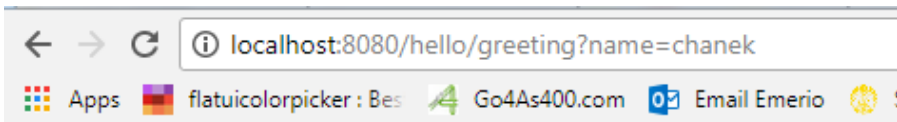
```
package com.example.demo.controller;

import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.web.bind.annotation.RequestParam;
import org.springframework.web.bind.annotation.RequestMapping;

@Controller
public class PageController {

    @RequestMapping("/hello")
    public String index()
    {
        return "hello123";
    }

    @RequestMapping("/hello/greeting")
    public String greeting (@RequestParam(value = "name") String name, Model model)
    {
        model.addAttribute("name", name);
        return "greeting";
    }
}
```



The screenshot shows a web browser window with the address bar containing the URL `localhost:8080/hello/greeting?name=chanek`. Below the address bar, there are several tabs or links: "Apps", "flatuicolorpicker: Bes", "Go4As400.com", "Email Emerio", and a yellow icon. The main content area of the browser displays the text "Selamat datang chanek!" in a blue font.

Selamat datang chanek!

Kembalikan request map menjadi @RequestMapping("/greeting")

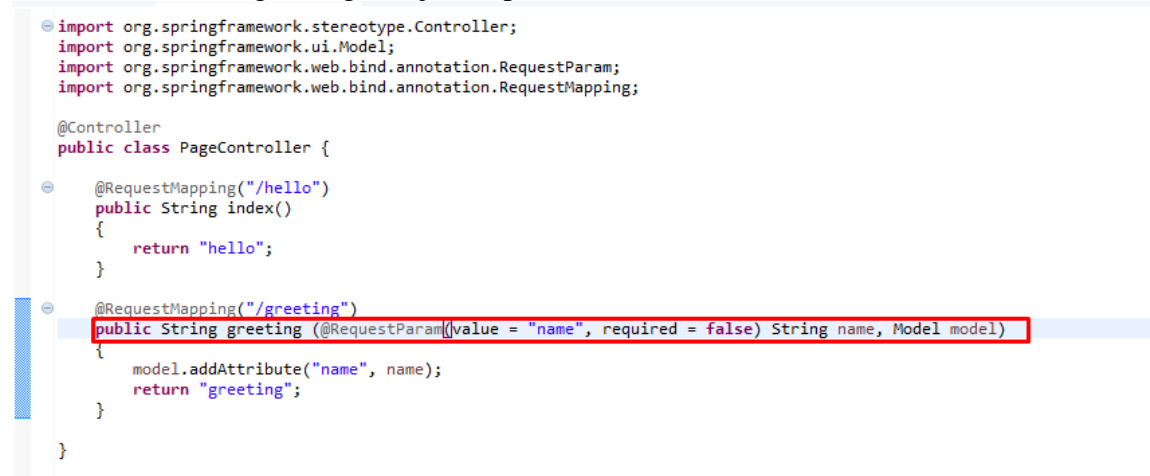
2. Akses **localhost:8080/greeting**

Pertanyaan: Apakah hasilnya?

Jawaban : Tampilan error karena parameter name tidak ikut dipanggil di url



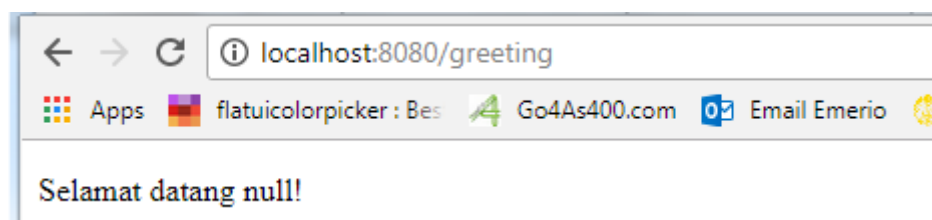
Ubah header method greeting menjadi seperti berikut



Stop Spring Boot yang sedang berjalan, run kembali, buka **localhost:8080/greeting**

Pertanyaan: Apakah hasilnya?

Jawaban : Tampilan “Selamat datang null!” karena parameter telah ditambahkan required = false



3. Ubah header method greeting menjadi seperti berikut

```
package com.example.demo.controller;

import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RequestParam;

@Controller
public class PageController {

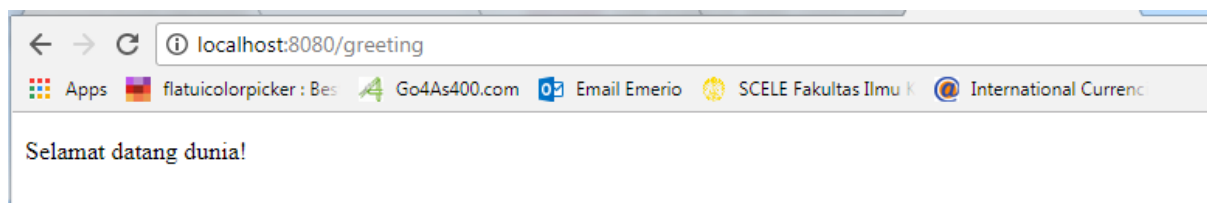
    @RequestMapping("/hello")
    public String index()
    {
        return "hello";
    }

    @RequestMapping("/greeting")
    public String greeting (@RequestParam(value = "name", required = false, defaultValue = "dunia") String name, Model model)
    {
        model.addAttribute("name", name);
        return "greeting";
    }
}
```

Stop Spring Boot yang sedang berjalan, run kembali, dan buka localhost:8080/greeting

Pertanyaan: apakah hasilnya?

Jawaban: Tampilan “Selamat datang dunia!” karena nilai defaultnya telah ditetapkan yaitu “dunia”



4. Perhatikan bahwa pada berkas greeting.html, tag paragraf yang kita tambahkan adalah sebagai berikut:

```
<p th:text="'Selamat datang ' + ${name} + '!'">Sapaan untuk user</p>
```

Pertanyaan: Mengapa tulisan “Sapaan untuk user” tidak pernah muncul?

Jawab :

<p th:text=”Selamat datang” adalah dari thymeleaf sedangkan Sapaan untuk user dari HTML. Pada tutorial ini kita menjalankan browser menggunakan springboot dengan template engine thymeleaf sehingga yang akan tampil hanya dari thymeleaf yaitu “Selamat datang dunia” dan “Sapaan untuk user” dari HTML tidak muncul

Path Variable

Cara lain untuk passing suatu data dari URL adalah menggunakan path variable. Contoh dari penggunaan path variable misalkan “/user/delete/{id}” dimana id merupakan path variable. Anda dapat mengirim data melalui path variable ke server pada Spring Boot.

Langkah:

1. PageController tambahkan import berikut:

```
import org.springframework.web.bind.annotation.PathVariable;
```

Dan tambahkan method greetingPath pada **PageController**

```
@RequestMapping("/greeting/{name}")
public String greetingPath (@PathVariable String name, Model model)
{
    model.addAttribute("name", name);
    return "greeting";
}
```

```
package com.example.demo.controller;

import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.web.bind.annotation.RequestParam;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.PathVariable;

@Controller
public class PageController {
```

```
import org.springframework.web.bind.annotation.PathVariable;

@Controller
public class PageController {

    @RequestMapping("/hello")
    public String index()
    {
        return "hello";
    }

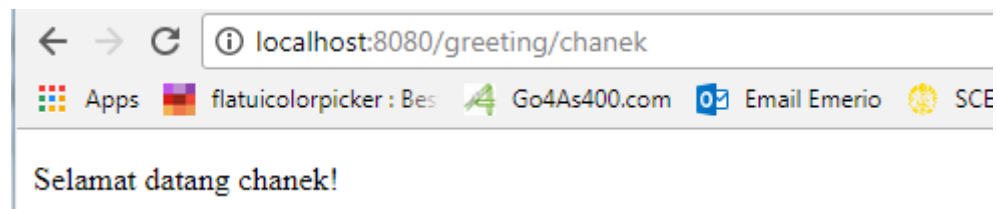
    @RequestMapping("/greeting")
    public String greeting (@RequestParam(value = "name", required = false,
    {
        model.addAttribute("name", name);
        return "greeting";
    }

    @RequestMapping("/greeting/{name}")
    public String greetingPath (@PathVariable String name, Model model)
    {
        model.addAttribute("name", name);
        return "greeting";
    }

}
```

2. Stop Spring Boot yang sedang berjalan, run kembali, dan buka

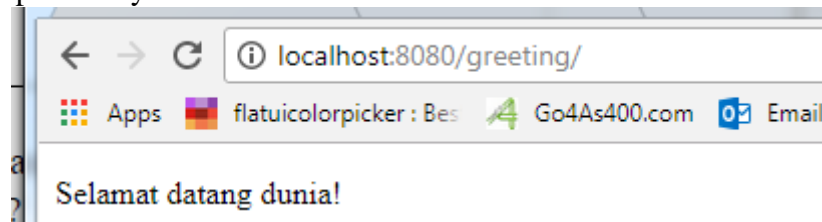
localhost:8080/greeting/chanek apakah hasilnya?



Latihan Path Variable

1. Akses localhost:8080/greeting/

Pertanyaan: Apa hasilnya?



Ubah method greetingPath menjadi seperti berikut

```
import java.util.Optional;
import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RequestParam;

@Controller
public class PageController {

    @RequestMapping("/hello")
    public String index() {
        return "hello";
    }

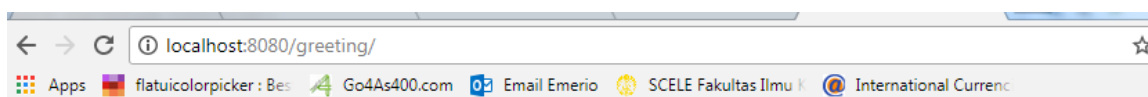
    @RequestMapping("/greeting")
    public String greeting (@RequestParam(value = "name", required = false, defaultValue = "dunia") String name, Model model) {
        model.addAttribute("name", name);
        return "greeting";
    }

    @RequestMapping(value = {"/greeting", "/greeting/{name}"})
    public String greetingPath (@PathVariable Optional<String> name, Model model) {
        if(name.isPresent()) {
            model.addAttribute("name", name.get());
        } else {
            model.addAttribute("name", "apap");
        }
    }
}
```

Akses localhost:8080/greeting/

Pertanyaan: Apa hasilnya?

Jawaban: Terjadi error karena terdapat method yang ambigu yaitu /greeting dan path variable tidak dipanggil



Whitelabel Error Page

This application has no explicit mapping for /error, so you are seeing this as a fallback.

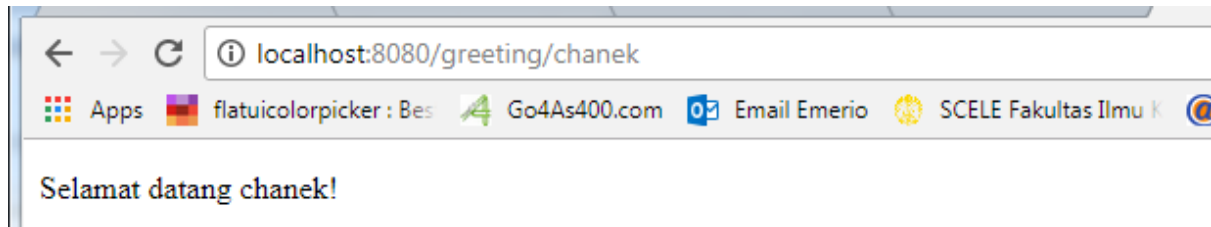
Sat Feb 24 14:20:50 ICT 2018

There was an unexpected error (type=Internal Server Error, status=500).

Ambiguous handler methods mapped for HTTP path 'http://localhost:8080/greeting/': {public java.lang.String com.example.demo.controller.PageController.greeting(java.lang.String,org.springframework.ui.Model), public java.lang.String com.example.demo.controller.PageController.greetingPath(java.util.Optional,org.springframework.ui.Model)}

Akses **localhost:8080/greeting/chanek**

Pertanyaan: Apa hasilnya?



Jawaban : Karena path variable dipanggil di url sehingga dapat diolah oleh controller

Path variable dan request parameter (query string) akan sering digunakan kedepannya dalam membuat request. Pastikan Anda memahami fungsi dan penggunaan kedua hal tersebut. Hal lain seputar penggunaan Spring Boot dapat Anda lihat pada dokumentasi Spring Boot pada tautan berikut <https://docs.spring.io/spring-boot/docs/current/reference/htmlsingle/> . Untuk dokumentasi Thymeleaf silakan ke tautan <http://www.thymeleaf.org/documentation.html> .

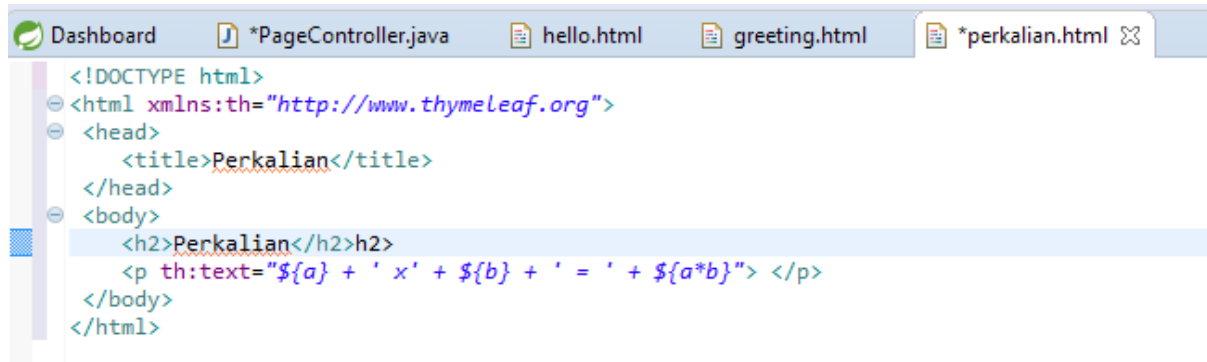
Materi Thymeleaf lebih detail akan dibahas pada perkuliahan.

Latihan

Screenshot controller perkalian

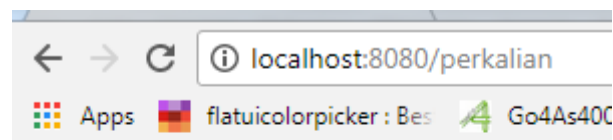
```
@RequestMapping("/perkalian")
public String perkalian (@RequestParam(value = "a", required = false, defaultValue = "0") Integer a,
                        @RequestParam(value = "b", required = false, defaultValue = "0") Integer b, Model model)
{
    model.addAttribute("a", a);
    model.addAttribute("b", b);
    model.addAttribute(a*b);
    return "perkalian";
}
```

Screenshot html perkalian



```
<!DOCTYPE html>
<html xmlns:th="http://www.thymeleaf.org">
<head>
<title>Perkalian</title>
</head>
<body>
<h2>Perkalian</h2>
<p th:text="${a} + ' x' + ${b} + ' = ' + ${a*b}"> </p>
</body>
</html>
```

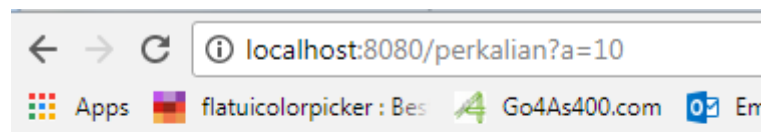
1. localhost:8080/perkalian



Perkalian

0 x0 = 0

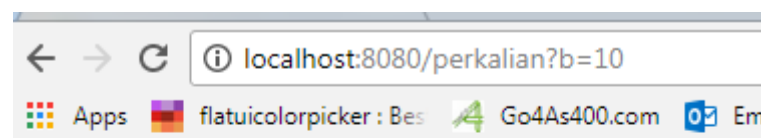
2. localhost:8080/perkalian?a=10



Perkalian

10 x0 = 0

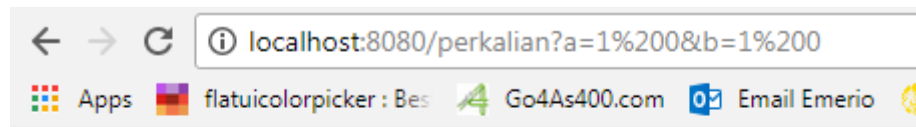
3. localhost:8080/perkalian?b=10



Perkalian

0 x10 = 0

4. localhost:8080/perkalian?a=10&b=10



Perkalian

$$10 \times 10 = 100$$