Getting started with Spring Boot

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Pivotal

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Contents

- HelloWorld (1.5h)
- Web (1h)
- DataAccess (1.5h)
- Actuator (0.5h)

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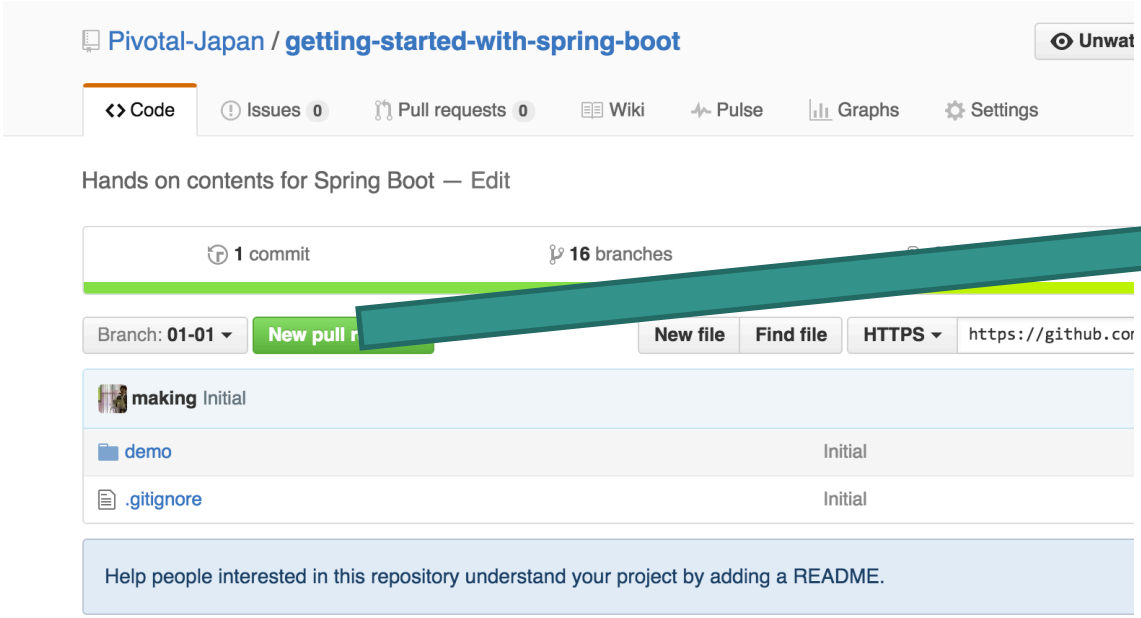
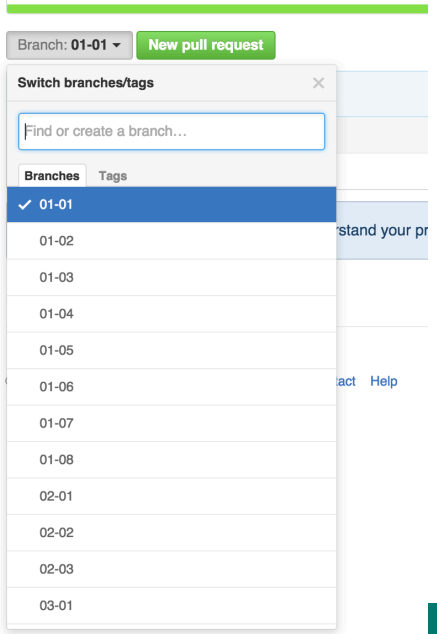
Source Code

https://github.com/Pivotal-Japan/getting-started-with-spring-boot





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Spring Framework

Spring is a Java framework for enterprise applications, supports

- dependency injection
- transaction management
- web applications
- data access
- messaging
- testing and more.

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Spring Boot

Spring Boot makes it easy to create stand-alone, production-grade Spring based Applications that you can "just run".

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Spring Boot

- Create stand-alone Spring applications
- Embed Tomcat, Jetty or Undertow directly
- Provide opinionated 'starter' POMs to simplify your Maven configuration
- Automatically configure Spring whenever possible
- Provide production-ready features such as metrics, health checks and externalized configuration
- Absolutely no code generation and no requirement for XML configuration

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Hello World

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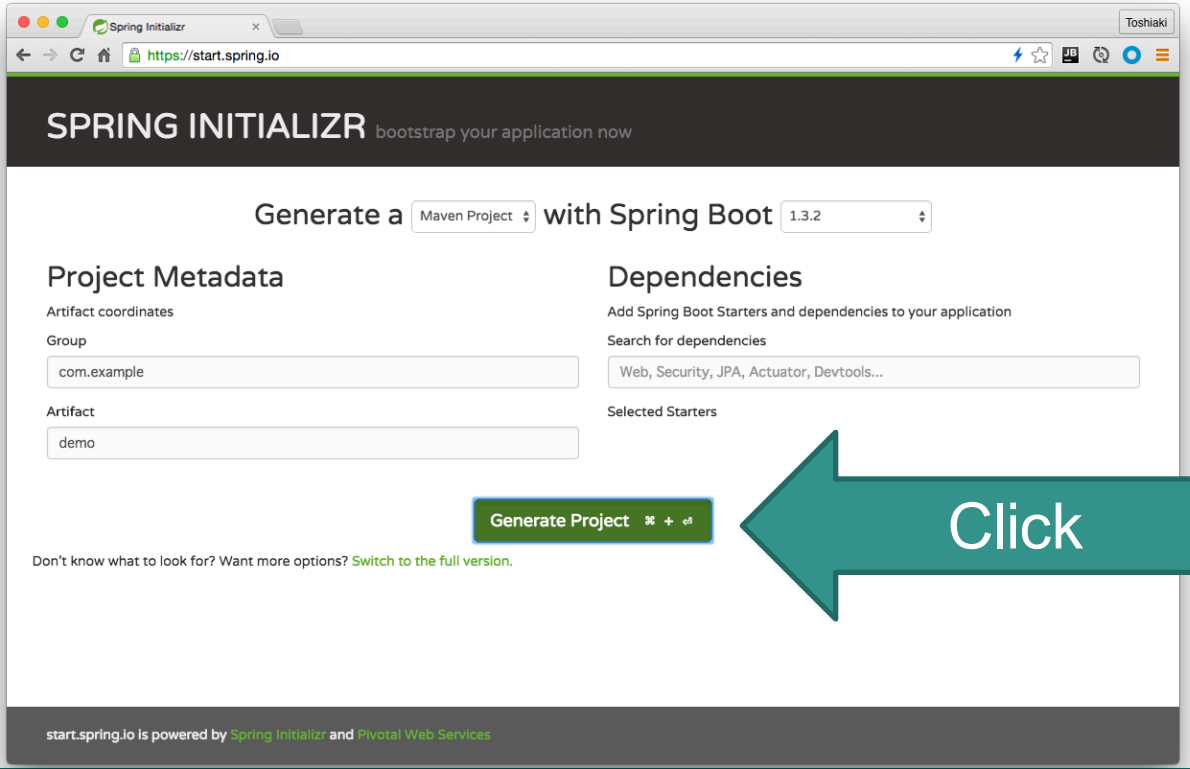
https://start.spring.io



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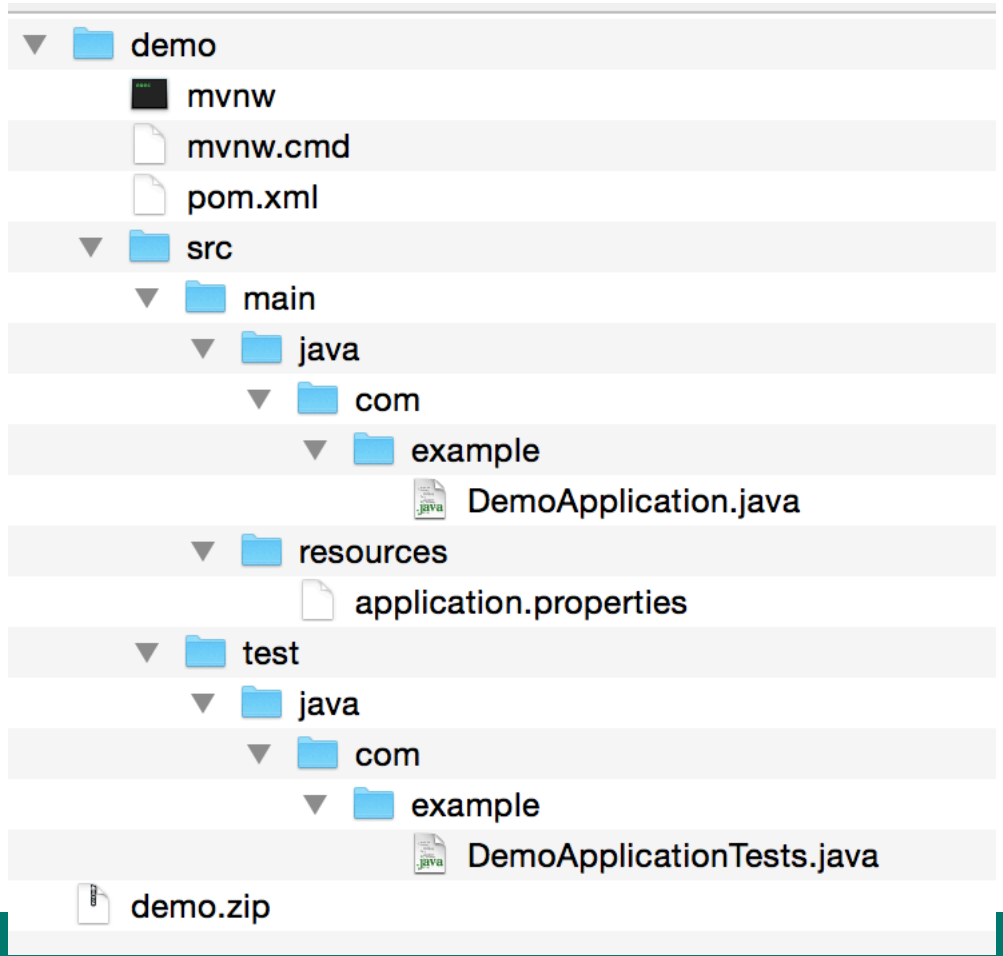

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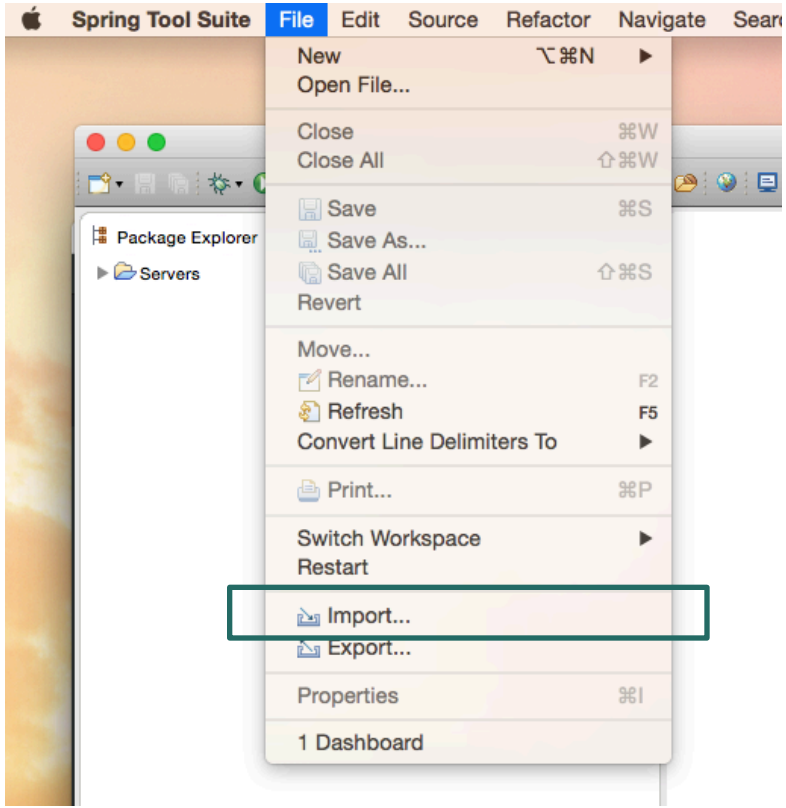

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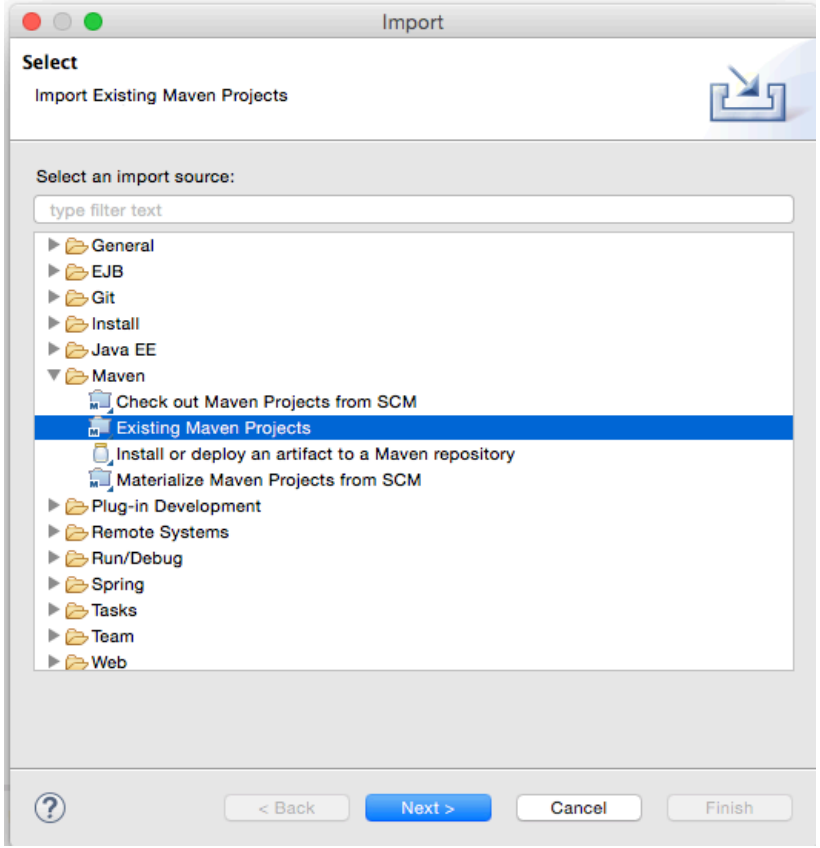

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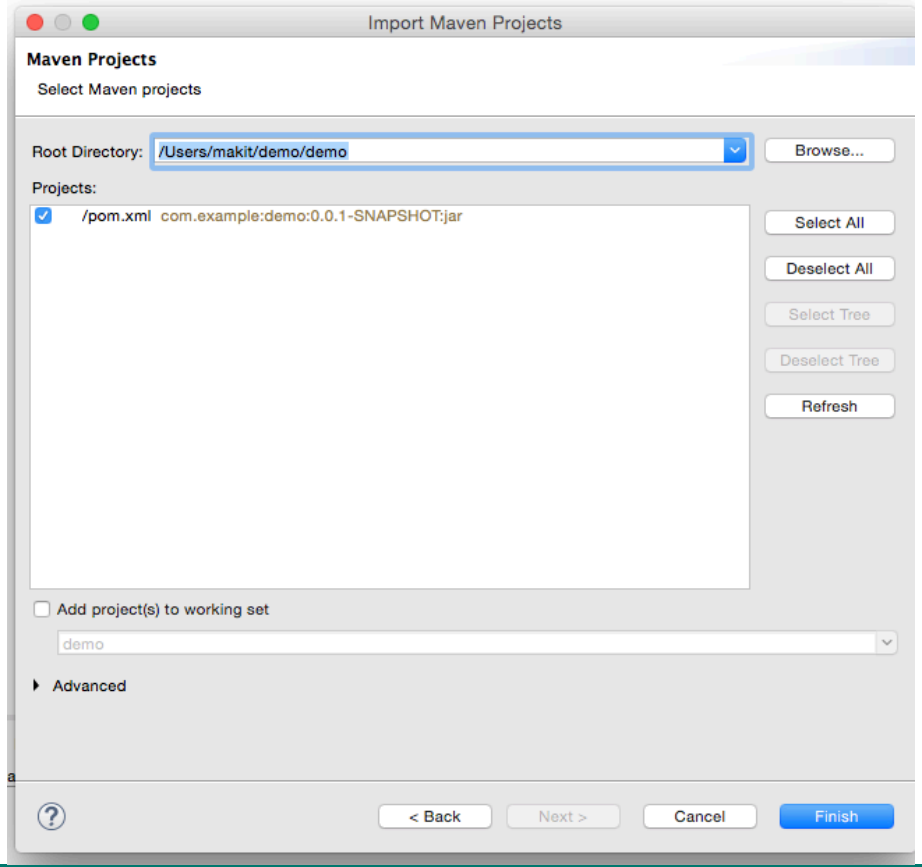

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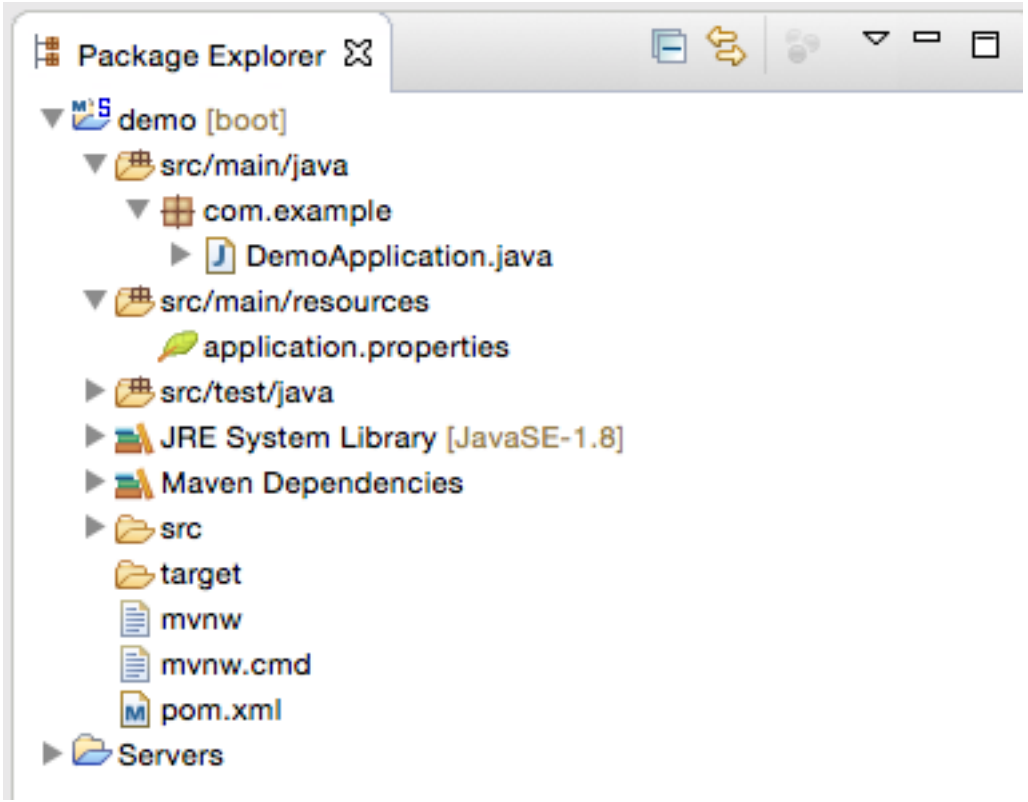

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Boilerplate entry point

```
@SpringBootApplication
public class DemoApplication {
   public static void main(String[] args) {
    SpringApplication.run(DemoApplication.class,args);
   }
}
```

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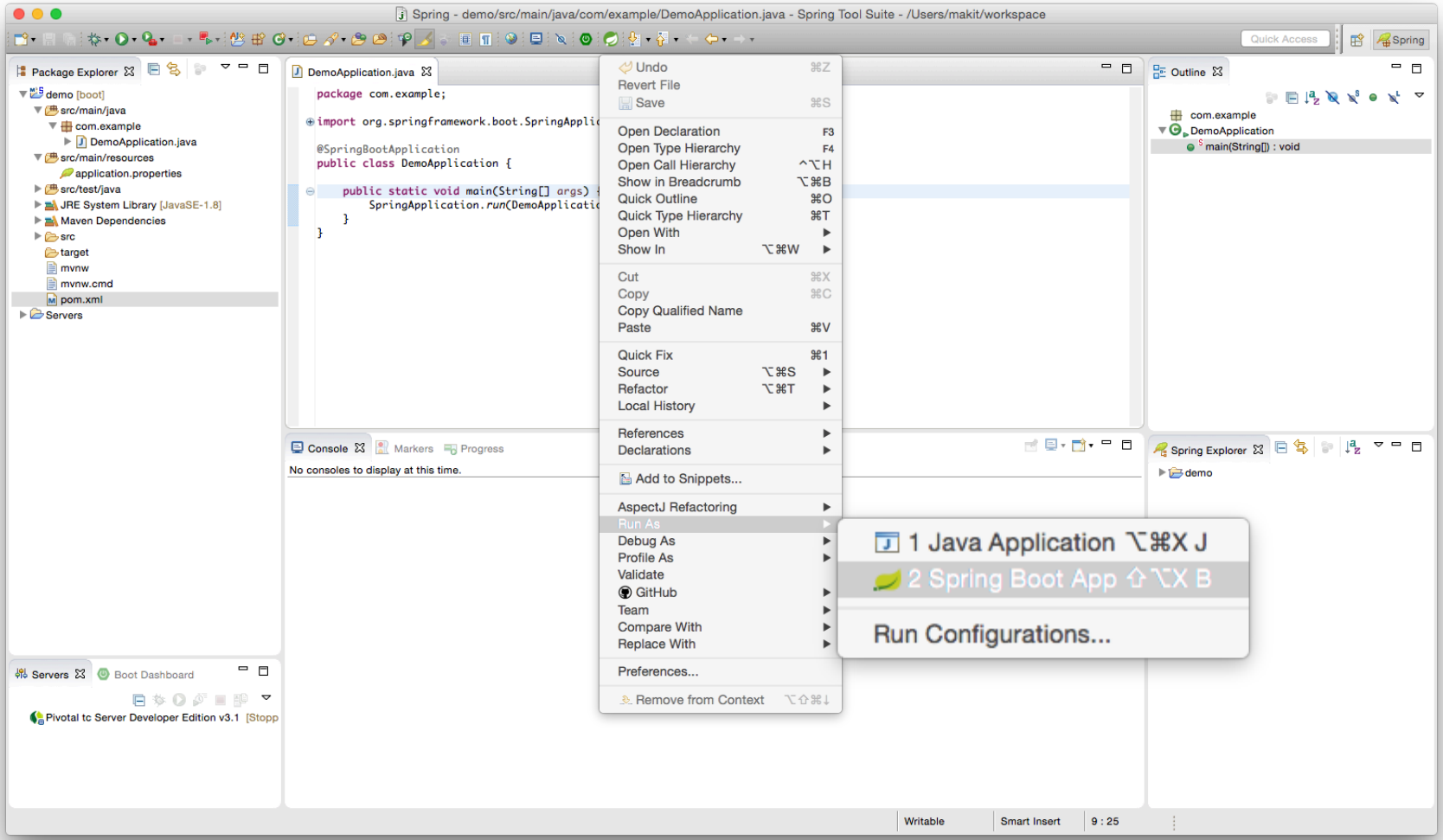

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Output (01-01)

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 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:08:49.902  INFO 89397 --- [           main] com.example.DemoApplication              : Starting DemoApplication on jpxxmakitm1.corp.emc.com with PID
89397 (/Users/makit/git/getting-started-with-spring-boot/demo/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:08:49.907  INFO 89397 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:08:49.968  INFO 89397 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@319b92f3: startup date [Tue Feb 07 10:08:49 JST 2017]; root of context hierarchy
2017-02-07 10:08:50.428  INFO 89397 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
2017-02-07 10:08:50.440  INFO 89397 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.762 seconds (JVM running for
1.055)
2017-02-07 10:08:50.441  INFO 89397 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@319b92f3: startup date [Tue Feb 07 10:08:49 JST 2017]; root of context hierarchy
2017-02-07 10:08:50.442  INFO 89397 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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Use CommandLineRunner

```
@SpringBootApplication
public class DemoApplication implements CommandLineRunner {
  public static void main(String[] args) {
   SpringApplication.run(DemoApplication.class,args);
  }
  @Override
  public void run(String... args) throws Exception {
    System.out.println("Hello World!");
  }
}
```

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Output (01-02)

```
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 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:12:24.618  INFO 90019 --- [           main] com.example.DemoApplication              : Starting DemoApplication on jpxxmakitm1.corp.emc.com with PID
90019 (/Users/makit/git/getting-started-with-spring-boot/demo/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:12:24.621  INFO 90019 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:12:24.673  INFO 90019 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@27d415d9: startup date [Tue Feb 07 10:12:24 JST 2017]; root of context hierarchy
2017-02-07 10:12:25.117  INFO 90019 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
```

Hello World!

```
2017-02-07 10:12:25.129  INFO 90019 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.729 seconds (JVM running for
1.027)
2017-02-07 10:12:25.129  INFO 90019 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@27d415d9: startup date [Tue Feb 07 10:12:24 JST 2017]; root of context hierarchy
2017-02-07 10:12:25.130  INFO 90019 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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Make a first component

```
package com.example;

public interface GreetingService {
    String greet();
}
```

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Implement GreetingService

```
package com.example;

public class SimpleGreetingService
                    implements GreetingService {
    @Override
    public String greet() {
        return "Hello World!";
    }
}
```

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Define a Bean

```
@SpringBootApplication
public class DemoApplication implements CommandLineRunner {

  @Bean
  GreetingService greetingService() {
    return new SimpleGreetingService();
  }

  public static void main(String[] args) {/* ommit */}
  @Override
  public void run(String... args) throws Exception {/* ommit */}
}
```

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Inject `GreetingService` & use this

```
@SpringBootApplication
public class DemoApplication implements CommandLineRunner {
  @Bean GreetingService greetingService() {/* ommit */}

  @Autowired
  GreetingService greetingService;

  public static void main(String[] args) {/* ommit */}

  @Override
  public void run(String... args) throws Exception {
    System.out.println(greetingService.greet());
  }
}
```

Output (01-03)

```
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 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:14:37.235  INFO 90402 --- [           main] com.example.DemoApplication              : Starting DemoApplication on jpxxmakitm1.corp.emc.com with PID
90402 (/Users/makit/git/getting-started-with-spring-boot/demo/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:14:37.238  INFO 90402 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:14:37.292  INFO 90402 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@27d415d9: startup date [Tue Feb 07 10:14:37 JST 2017]; root of context hierarchy
2017-02-07 10:14:37.759  INFO 90402 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
Hello World!
2017-02-07 10:14:37.771  INFO 90402 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.752 seconds (JVM running for
1.054)
2017-02-07 10:14:37.772  INFO 90402 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@27d415d9: startup date [Tue Feb 07 10:14:37 JST 2017]; root of context hierarchy
2017-02-07 10:14:37.773  INFO 90402 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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Annotate with @Component

```
@Component
public class SimpleGreetingService
                    implements GreetingService {
    @Override
    public String greet() {
        return "Hello World!";
    }
}
```

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Remove the Bean definition

```
@SpringBootApplication
public class DemoApplication implements CommandLineRunner {
  @Bean GreetingService greetingService() {/* ommit */}

  @Autowired
  GreetingService greetingService;

  public static void main(String[] args) {/* ommit */}

  @Override
  public void run(String... args) throws Exception {
    System.out.println(greetingService.greet());
  }
}
```

Remove the Bean definition

```
@SpringBootApplication
public class DemoApplication implements CommandLineRunner {

  @Autowired
  GreetingService greetingService;

  public static void main(String[] args) {/* ommit */}

  @Override
  public void run(String... args) throws Exception {
    System.out.println(greetingService.greet());
  }
}
```

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Output (01-04)

```
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 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:17:22.878  INFO 91014 --- [           main] com.example.DemoApplication              : Starting DemoApplication on jpxxmakitm1.corp.emc.com with PID
91014 (/Users/makit/git/getting-started-with-spring-boot/demo/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:17:22.883  INFO 91014 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:17:22.939  INFO 91014 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@27d415d9: startup date [Tue Feb 07 10:17:22 JST 2017]; root of context hierarchy
2017-02-07 10:17:23.479  INFO 91014 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
Hello World!
2017-02-07 10:17:23.509  INFO 91014 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.858 seconds (JVM running for
1.158)
2017-02-07 10:17:23.510  INFO 91014 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@27d415d9: startup date [Tue Feb 07 10:17:22 JST 2017]; root of context hierarchy
2017-02-07 10:17:23.513  INFO 91014 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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Make another GreetingService

```
@Component
public class PropertyGreetingService
                    implements GreetingService {
    @Value("${greeting.message}")
    String message;
    @Override
    public String greet() {
        return message;
    }
}
```

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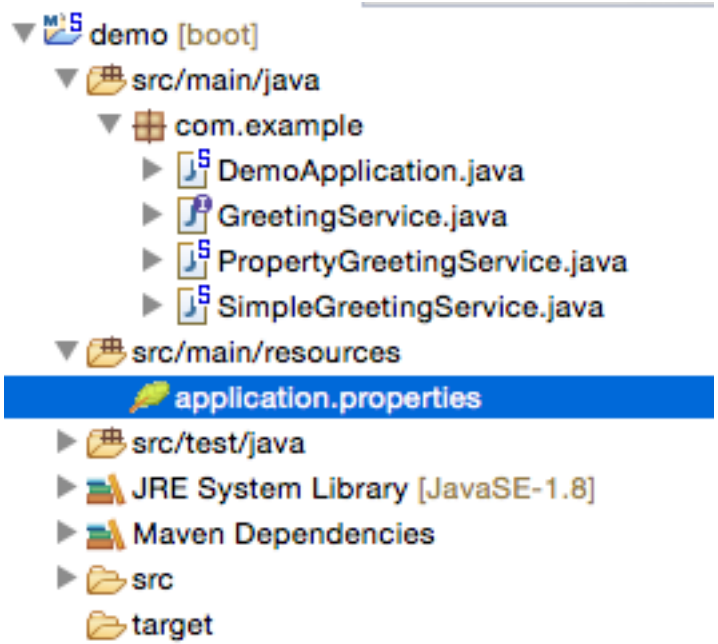
Configure the property



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Make another `GreetingService`

```
greeting.message=Hello New World!
```


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Remove @Component from Simple

```
@Component
public class SimpleGreetingService
                    implements GreetingService {
    @Override
    public String greet() {
        return "Hello World!";
    }
}
```

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Remove @Component from Simple

```
public class SimpleGreetingService
                    implements GreetingService {
    @Override
    public String greet() {
        return "Hello World!";
    }
}
```

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Output (01-05)

```
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 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:19:27.078  INFO 91368 --- [           main] com.example.DemoApplication              : Starting DemoApplication on jpxxmakitm1.corp.emc.com with PID
91368 (/Users/makit/git/getting-started-with-spring-boot/demo/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:19:27.081  INFO 91368 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:19:27.135  INFO 91368 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@17211155: startup date [Tue Feb 07 10:19:27 JST 2017]; root of context hierarchy
2017-02-07 10:19:27.591  INFO 91368 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
```

Hello New World!

```
2017-02-07 10:19:27.603  INFO 91368 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.749 seconds (JVM running for
1.044)
2017-02-07 10:19:27.604  INFO 91368 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@17211155: startup date [Tue Feb 07 10:19:27 JST 2017]; root of context hierarchy
2017-02-07 10:19:27.605  INFO 91368 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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What happen unless removing

```
@Component // <----
public class SimpleGreetingService
                    implements GreetingService {
    @Override
    public String greet() {
        return "Hello World!";
    }
}
```

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Output

```
Error starting ApplicationContext. To display the auto-configuration report re-run your application with 'debug' enabled.
2017-02-07 10:20:48.221 ERROR 91576 --- [           main] o.s.b.d.LoggingFailureAnalysisReporter   :

***************************
APPLICATION FAILED TO START
***************************

Description:

Field greetingService in com.example.DemoApplication required a single bean, but 2 were found:
            - propertyGreetingService: defined in file [/Users/makit/git/getting-started-with-spring-
boot/demo/target/classes/com/example/PropertyGreetingService.class]
            - simpleGreetingService: defined in file [/Users/makit/git/getting-started-with-spring-
boot/demo/target/classes/com/example/SimpleGreetingService.class]


Action:

Consider marking one of the beans as @Primary, updating the consumer to accept multiple beans, or using @Qualifier to
identify the bean that should be consumed
```

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Solutions

1. Specify the Bean name explicitly with `@Qualifier` + `@Autowired`
2. Remove `@Component` from both and specify the concrete bean with `@Bean`
3. Annotate `@Primary` on preferred one

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Solution 1

```
@SpringBootApplication
public class DemoApplication implements CommandLineRunner {

  @Autowired
  @Qualifier("propertyGreetingService") // or simpleGreeting...
  GreetingService greetingService;

  public static void main(String[] args) {/* ommit */}

  @Override
  public void run(String... args) throws Exception {
    System.out.println(greetingService.greet());
  }
}
```

Output (01-06)

```
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 ¥¥/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_¥__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:25:51.394  INFO 92482 --- [           main] com.example.DemoApplication              : Starting DemoApplication on jpxxmakitm1.corp.emc.com with PID
92482 (/Users/makit/git/getting-started-with-spring-boot/demo/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:25:51.398  INFO 92482 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:25:51.446  INFO 92482 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@17211155: startup date [Tue Feb 07 10:25:51 JST 2017]; root of context hierarchy
2017-02-07 10:25:51.896  INFO 92482 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
Hello New World!
2017-02-07 10:25:51.908  INFO 92482 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.742 seconds (JVM running for
1.026)
2017-02-07 10:25:51.909  INFO 92482 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@17211155: startup date [Tue Feb 07 10:25:51 JST 2017]; root of context hierarchy
2017-02-07 10:25:51.910  INFO 92482 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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Solution 2

```
@SpringBootApplication
public class DemoApplication implements CommandLineRunner {

  @Bean // remove @Component from both GreetingService
  GreetingService greetingService() {
    return new PropertyGreetingService();
  }

  public static void main(String[] args) {/* ommit */}
  @Override
  public void run(String... args) throws Exception {/* ommit */}
}
```

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Output (01-07)

```
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 ¥¥/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_¥__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:31:10.260   INFO 93387 --- [           main] com.example.DemoApplication              : Starting DemoApplication on jpxxmakitm1.corp.emc.com with PID
93387 (/Users/makit/git/getting-started-with-spring-boot/demo/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:31:10.264   INFO 93387 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:31:10.314   INFO 93387 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@17211155: startup date [Tue Feb 07 10:31:10 JST 2017]; root of context hierarchy
2017-02-07 10:31:10.796   INFO 93387 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
Hello New World!
2017-02-07 10:31:10.809   INFO 93387 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.769 seconds (JVM running for
1.055)
2017-02-07 10:31:10.810   INFO 93387 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@17211155: startup date [Tue Feb 07 10:31:10 JST 2017]; root of context hierarchy
2017-02-07 10:31:10.811   INFO 93387 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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Solution 3

```
@Component
@Primary
public class PropertyGreetingService
                        implements GreetingService {
    @Value("${greeting.message}")
    String message;
    @Override
    public String greet() {
        return message;
    }
}
```

Output (01-08)

```
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( ( )¥___ | '_ | '_| | '_ ¥/ _` | ¥ ¥ ¥ ¥
 ¥¥/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_¥__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:33:09.088  INFO 93715 --- [           main] com.example.DemoApplication              : Starting DemoApplication on jpxxmakitm1.corp.emc.com with PID
93715 (/Users/makit/git/getting-started-with-spring-boot/demo/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:33:09.091  INFO 93715 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:33:09.141  INFO 93715 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@17211155: startup date [Tue Feb 07 10:33:09 JST 2017]; root of context hierarchy
2017-02-07 10:33:09.600  INFO 93715 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
Hello New World!
2017-02-07 10:33:09.612  INFO 93715 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.748 seconds (JVM running for
1.039)
2017-02-07 10:33:09.613  INFO 93715 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@17211155: startup date [Tue Feb 07 10:33:09 JST 2017]; root of context hierarchy
2017-02-07 10:33:09.614  INFO 93715 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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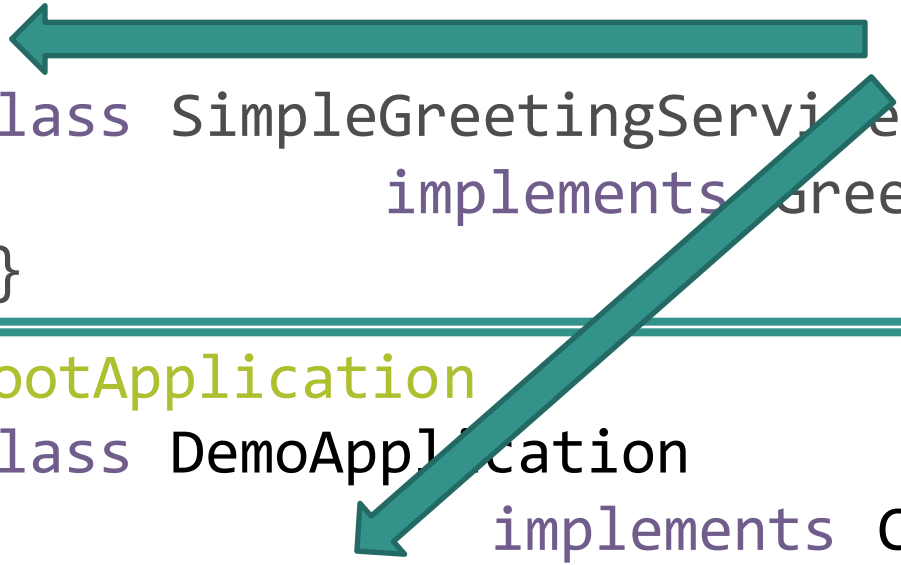
Solution 4

```
@Component
@Vanilla
public class SimpleGreetingService
                    implements GreetingService
{/*...*/}
```

```
@SpringBootApplication
public class DemoApplication
                    implements CommandLineRunner {
  @Autowired @Vanilla
  GreetingService greetingService;
}
```



Solution 4

```
package com.example;
import org.springframework.beans.factory.annotation.Qualifier;
import java.lang.annotation.*;
@Target({ElementType.FIELD, ElementType.METHOD,
                                                ElementType.TYPE})
@Retention(RetentionPolicy.RUNTIME)
@Inherited
@Documented
@Qualifier
public @interface Vanilla {
}
```

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Build the application

```
$ cd demo
$ ./mvnw clean package -Dmaven.test.skip=true
$ java -jar target/demo-0.0.1-SNAPSHOT.jar
```

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Change the property

```
$ java -jar target/demo-0.0.1-SNAPSHOT.jar --greeting.message=Hi

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( ( )¥___ | '_ | '_| | '_ ¥/ _` | ¥ ¥ ¥ ¥
 ¥¥/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_¥__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:35:02.415  INFO 94047 --- [           main] com.example.DemoApplication              : Starting DemoApplication v0.0.1-SNAPSHOT on
jpxxmakitm1.corp.emc.com with PID 94047 (/Users/makit/git/getting-started-with-spring-boot/demo/target/demo-0.0.1-SNAPSHOT.jar started by makit in
/Users/makit/git/getting-started-with-spring-boot/demo)
2017-02-07 10:35:02.419  INFO 94047 --- [           main] com.example.DemoApplication              : No active profile set, falling back to default profiles:
default
2017-02-07 10:35:02.479  INFO 94047 --- [           main] s.c.a.AnnotationConfigApplicationContext : Refreshing
org.springframework.context.annotation.AnnotationConfigApplicationContext@5b37e0d2: startup date [Tue Feb 07 10:35:02 JST 2017]; root of context hierarchy
2017-02-07 10:35:02.985  INFO 94047 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup

Hi

2017-02-07 10:35:02.998  INFO 94047 --- [           main] com.example.DemoApplication              : Started DemoApplication in 0.901 seconds (JVM running for
1.271)
2017-02-07 10:35:02.999  INFO 94047 --- [       Thread-2] s.c.a.AnnotationConfigApplicationContext : Closing
org.springframework.context.annotation.AnnotationConfigApplicationContext@5b37e0d2: startup date [Tue Feb 07 10:35:02 JST 2017]; root of context hierarchy
2017-02-07 10:35:03.001  INFO 94047 --- [       Thread-2] o.s.j.e.a.AnnotationMBeanExporter        : Unregistering JMX-exposed beans on shutdown
```

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Web Application

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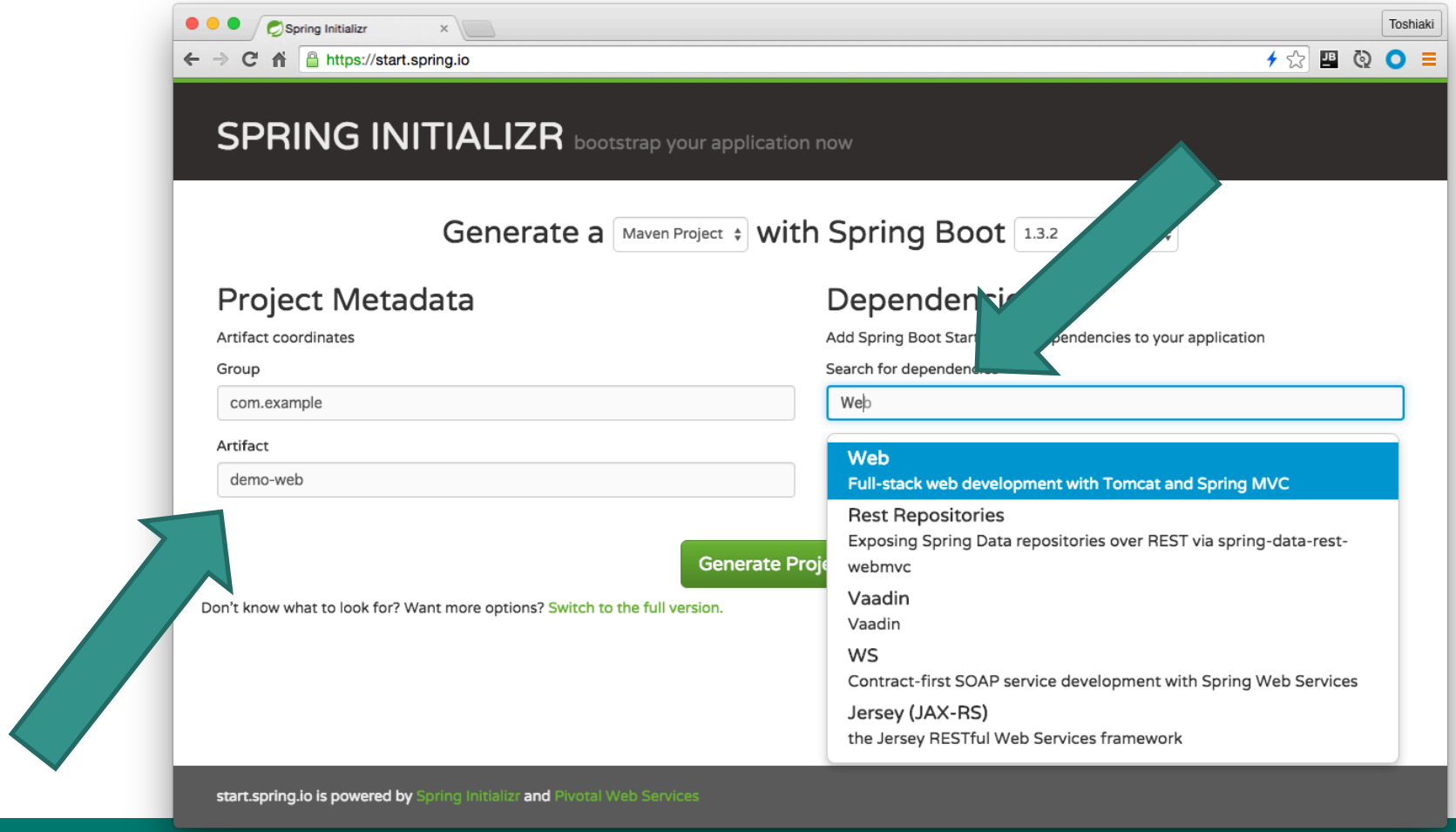

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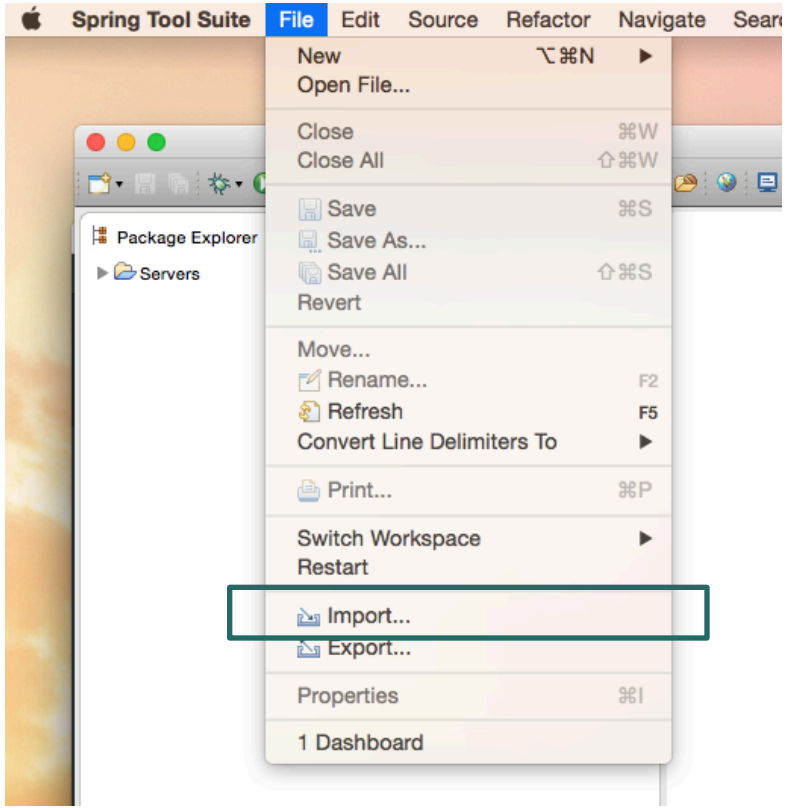

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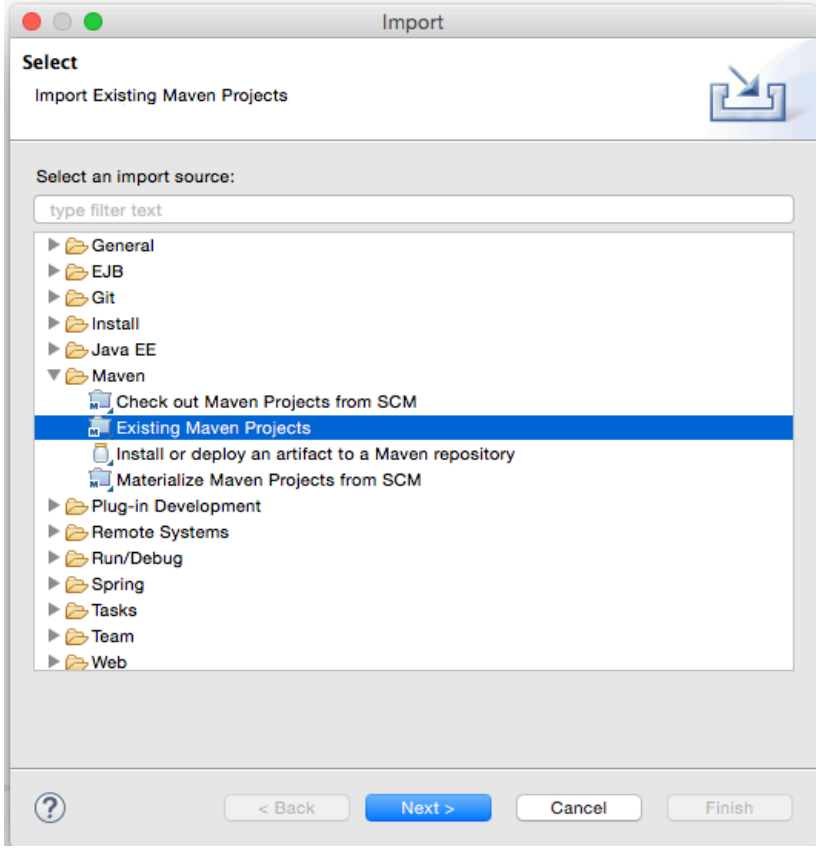

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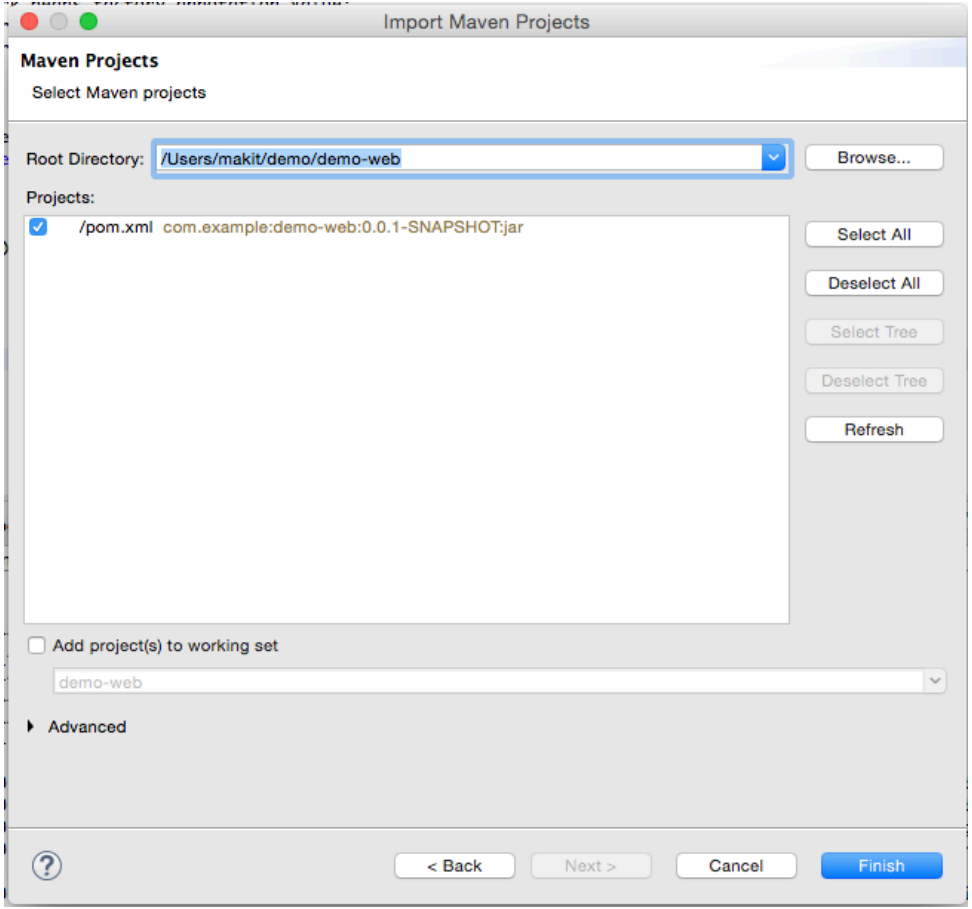

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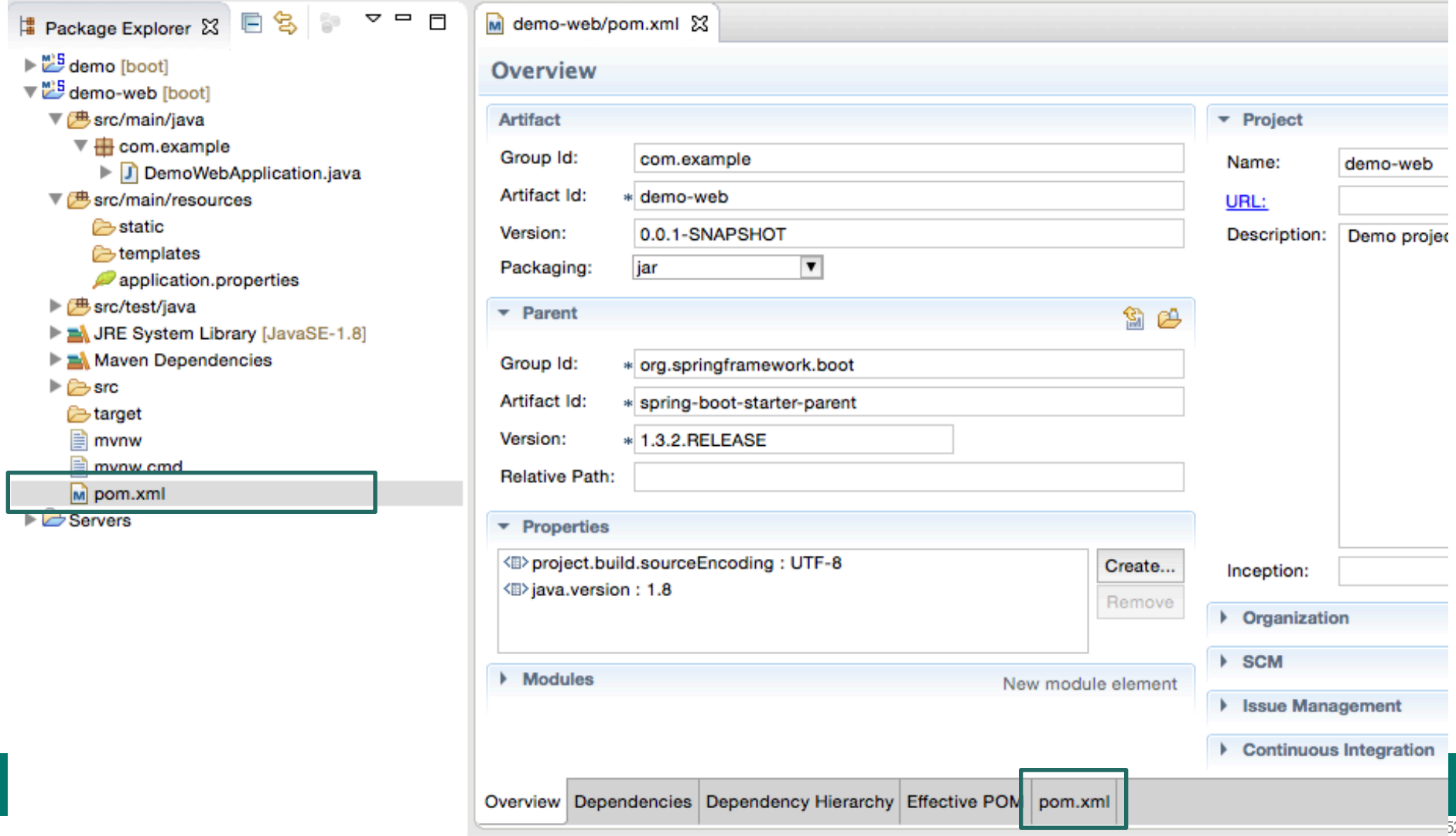
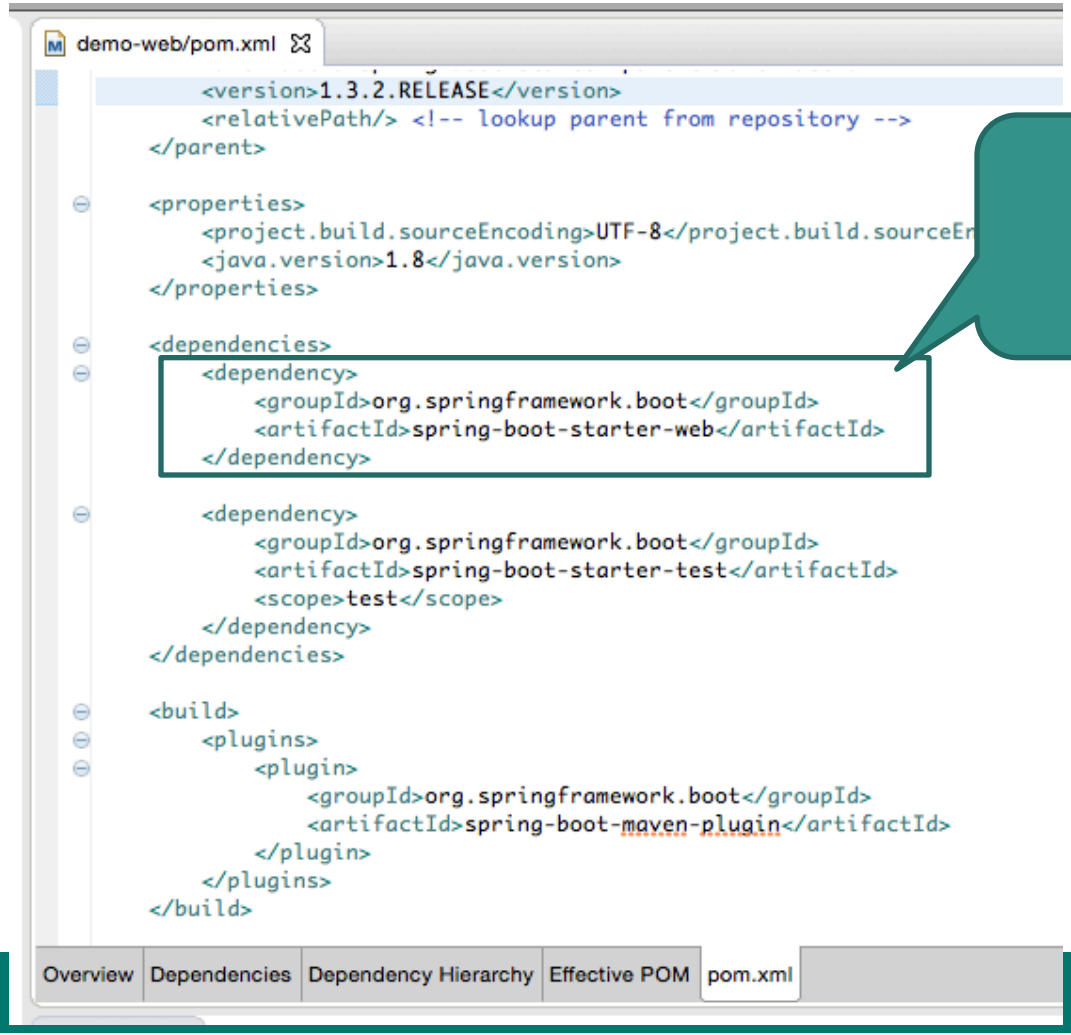

Package Explorer
demo [boot]
demo-web [boot]
src/main/java
com.example
DemoWebApplication.java
src/main/resources
static
templates
application.properties
src/test/java
JRE System Library [JavaSE-1.8]
Maven Dependencies
src
target
mvnw
mvnw.cmd
pom.xml
Servers
demo-web/pom.xml
Overview
Artifact
Group Id: com.example
Artifact Id: * demo-web
Version: 0.0.1-SNAPSHOT
Packaging: jar
Parent
Group Id: * org.springframework.boot
Artifact Id: * spring-boot-starter-parent
Version: * 1.3.2.RELEASE
Relative Path:
Properties
project.build.sourceEncoding : UTF-8
java.version : 1.8
Create...
Remove
Modules
New module element
Project
Name: demo-web
URL:
Description: Demo projec
Inception:
Organization
SCM
Issue Management
Continuous Integration
Overview
Dependencies
Dependency Hierarchy
Effective POM
pom.xml



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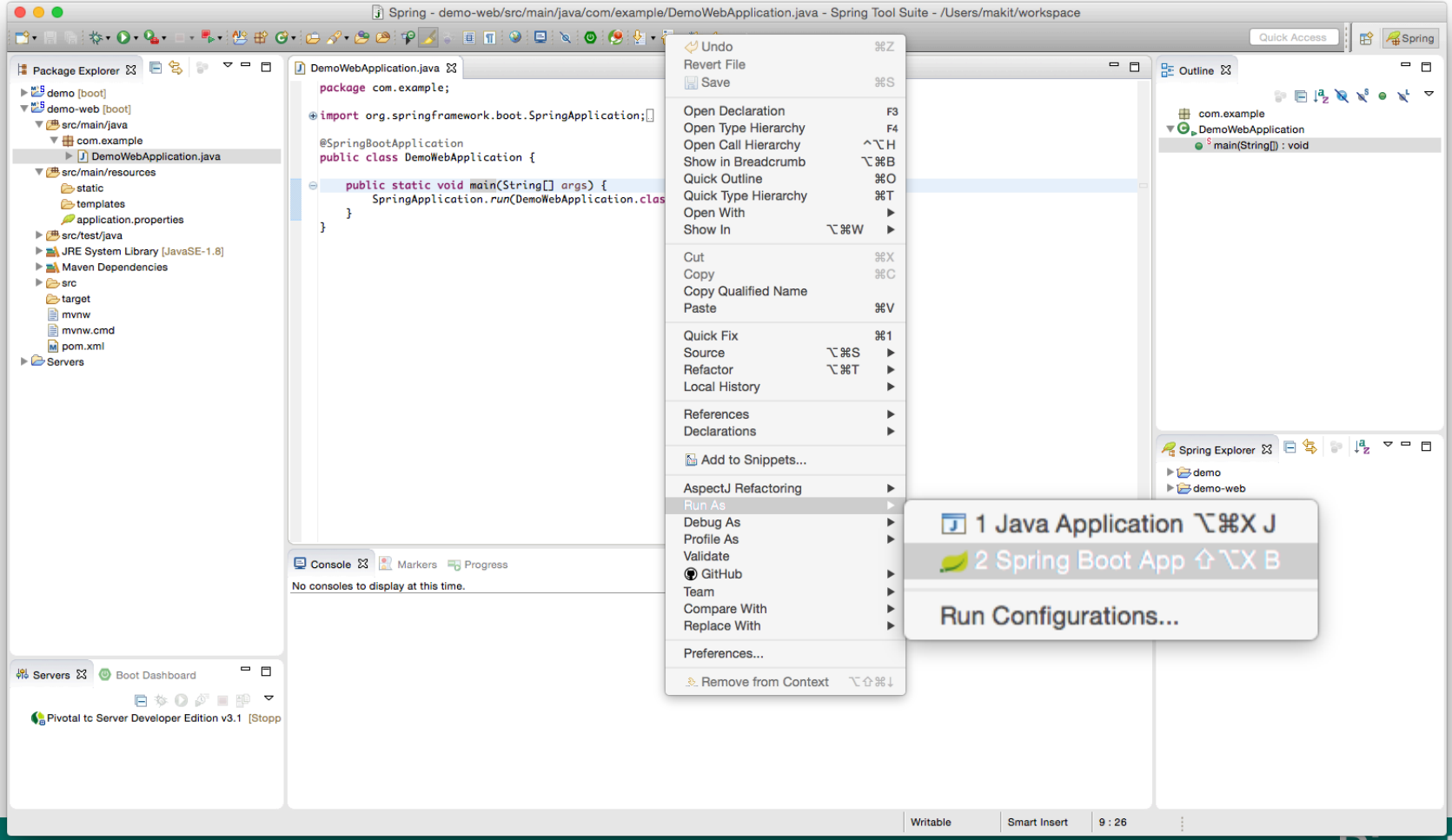

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Output (02-01)

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( ( )¥___ | '_ | '_| | '_ ¥/ _` | ¥ ¥ ¥ ¥
 ¥¥/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_¥__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:41:20.740  INFO 95220 --- [          main] com.example.DemoWebApplication         : Starting DemoWebApplication on jpxxmakitm1.corp.emc.com with PID 95220 (/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes started by
makit in /Users/makit/git/getting-started-with-spring-boot/demo-web)
2017-02-07 10:41:20.743  INFO 95220 --- [          main] com.example.DemoWebApplication         : No active profile set, falling back to default profiles: default
2017-02-07 10:41:20.810  INFO 95220 --- [          main] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@4b9e255: startup date [Tue Feb 07 10:41:20 JST 2017];
root of context hierarchy
2017-02-07 10:41:21.488  INFO 95220 --- [          main] trationDelegate$BeanPostProcessorChecker : Bean 'org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration' of type [class
org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 10:41:21.545  INFO 95220 --- [          main] trationDelegate$BeanPostProcessorChecker : Bean 'validator' of type [class org.springframework.validation.beanvalidation.LocalValidatorFactoryBean] is not eligible for getting processed by all
BeanPostProcessors (for example: not eligible for auto-proxying)



2017-02-07 10:41:21.778  INFO 95220 --- [          main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with
port(s): 8080 (http)
2017-02-07 10:41:21.793  INFO 95220 --- [          main] o.apache.catalina.core.StandardService   : Starting service Tomcat
```

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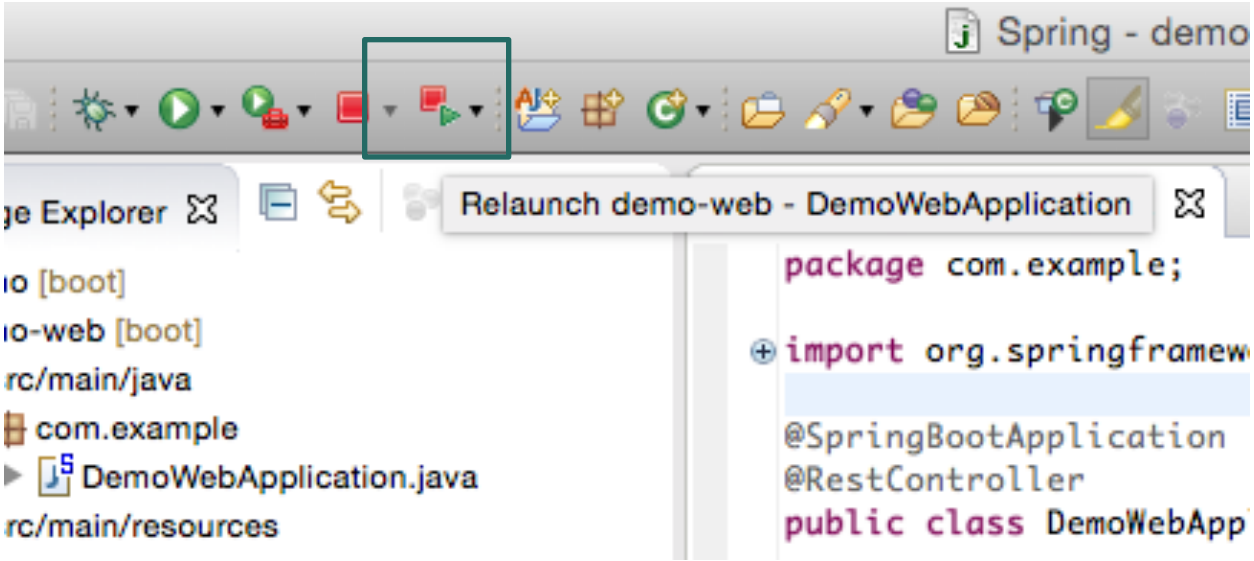
First Controller

```
@SpringBootApplication
@RestController
public class DemoApplication {
  @GetMapping("/")
  String hello() {
    return "Hello World!";
  }
  public static void main(String[] args) {
   SpringApplication.run(DemoApplication.class,args);
  }
}
```



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Output (02-02)

```
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( ( )¥___ | '_ | '_| | '_ ¥/ _` | ¥ ¥ ¥ ¥
 ¥¥/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_¥__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:45:57.323  INFO 96035 --- [          main] com.example.DemoWebApplication         : Starting DemoWebApplication on jpxxmakitm1.corp.emc.com with PID 96035 (/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes started by
makit in /Users/makit/git/getting-started-with-spring-boot/demo-web)
2017-02-07 10:45:57.327  INFO 96035 --- [          main] com.example.DemoWebApplication         : No active profile set, falling back to default profiles: default
2017-02-07 10:45:57.392  INFO 96035 --- [          main] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@4b9e255: startup date [Tue Feb 07 10:45:57 JST 2017];
root of context hierarchy
2017-02-07 10:45:58.078  INFO 96035 --- [          main] trationDelegate$BeanPostProcessorChecker : Bean 'org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration' of type [class
org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 10:45:58.139  INFO 96035 --- [          main] trationDelegate$BeanPostProcessorChecker : Bean 'validator' of type [class org.springframework.validation.beanvalidation.LocalValidatorFactoryBean] is not eligible for getting processed by all
BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 10:45:58.376  INFO 96035 --- [          main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with port(s): 8080 (http)
2017-02-07 10:45:58.392  INFO 96035 --- [          main] o.apache.catalina.core.StandardService   : Starting service Tomcat
2017-02-07 10:45:58.393  INFO 96035 --- [          main] org.apache.catalina.core.StandardEngine  : Starting Servlet Engine: Apache Tomcat/8.5.11
2017-02-07 10:45:58.487  INFO 96035 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring embedded WebApplicationContext
2017-02-07 10:45:58.487  INFO 96035 --- [ost-startStop-1] o.s.web.context.ContextLoader            : Root WebApplicationContext: initialization completed in 1099 ms
2017-02-07 10:45:58.603  INFO 96035 --- [ost-startStop-1] o.s.b.w.servlet.ServletRegistrationBean  : Mapping servlet: 'dispatcherServlet' to [/]
2017-02-07 10:45:58.607  INFO 96035 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'characterEncodingFilter' to: [/*]
2017-02-07 10:45:58.607  INFO 96035 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
2017-02-07 10:45:58.607  INFO 96035 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'httpPutFormContentFilter' to: [/*]
2017-02-07 10:45:58.607  INFO 96035 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'requestContextFilter' to: [/*]
2017-02-07 10:45:58.859  INFO 96035 --- [          main] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@4b9e255: startup date [Tue Feb 07
10:45:57 JST 2017]; root of context hierarchy


2017-02-07 10:45:58.926  INFO 96035 --- [          main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/],methods=[GET]}" onto
java.lang.String com.example.DemoWebApplication.hello()
2017-02-07 10:45:58.931  INFO 96035 --- [          main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error]}" onto public org.springframework.http.ResponseEntity<java.util.Map<java.lang.String, java.lang.Object>>
org.springframework.boot.autoconfigure.web.BasicErrorController.error(javax.servlet.http.HttpServletRequest)
2017-02-07 10:45:58.931  INFO 96035 --- [          main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error],produces=[text/html]}" onto public org.springframework.web.servlet.ModelAndView
org.springframework.boot.autoconfigure.web.BasicErrorController.errorHtml(javax.servlet.http.HttpServletRequest,javax.servlet.http.HttpServletResponse)
2017-02-07 10:45:58.962  INFO 96035 --- [          main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/webjars/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 10:45:58.962  INFO 96035 --- [          main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 10:45:59.049  INFO 96035 --- [          main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 10:45:59.243  INFO 96035 --- [          main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
2017-02-07 10:45:59.310  INFO 96035 --- [          main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s): 8080 (http)
2017-02-07 10:45:59.314  INFO 96035 --- [          main] com.example.DemoWebApplication         : Started DemoWebApplication in 2.242 seconds (JVM running for 2.583)
```

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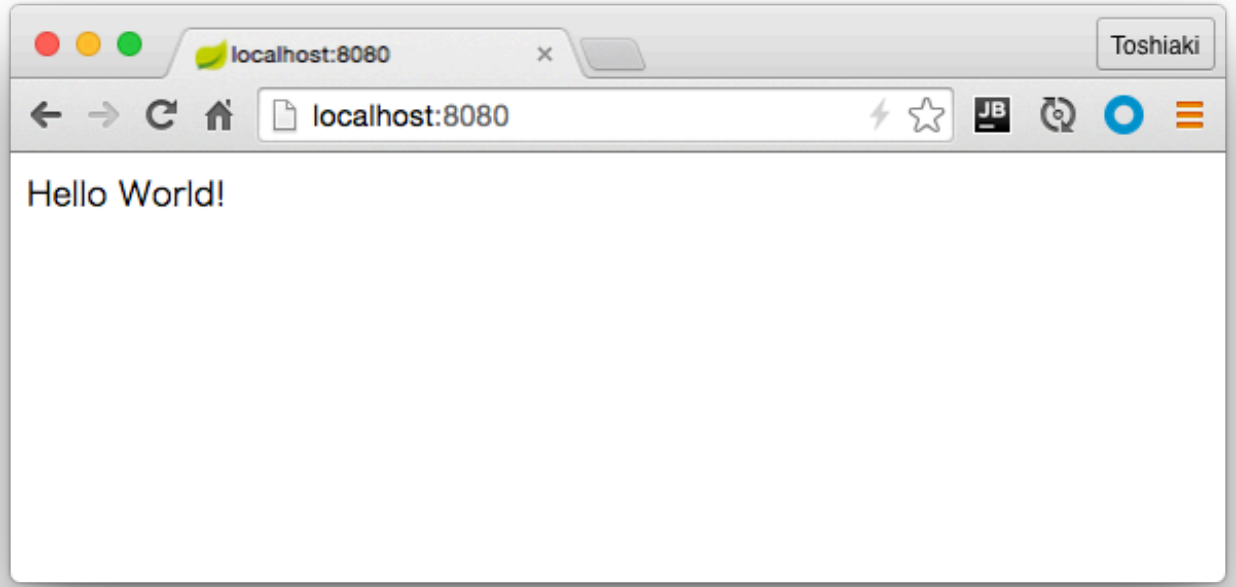
http://localhost:8080



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Create new Controller (REST API)

```
package com.example;

public class City {
  private Integer id;
  private String name;

  public Integer getId() {
    return id;
  }
  public void setId(Integer id) {
    this.id = id;
  }
  public String getName() {
    return name;
  }
  public void setName(String name) {
    this.name = name;
  }
}
```

Create new Controller (REST API)

```
@RestController
public class CityController {
  static List<City> cities = new CopyOnWriteArrayList<>();
  static AtomicInteger counter = new AtomicInteger(0);

  @GetMapping("/cities")
  List<City> getCities() {
    return cities;
  }

  @PostMapping("/cities")
  City postCities(@RequestBody City city) {
    city.setId(counter.incrementAndGet());
    cities.add(city);
    return city;
  }
}
```

Output (02-03)

```
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( ( )¥___ | '_ | '_| | '_ ¥/ _` | ¥ ¥ ¥ ¥
 ¥¥/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_¥__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 10:58:29.389  INFO 99327 --- [          main] com.example.DemoWebApplication         : Starting DemoWebApplication on jpxxmakitm1.corp.emc.com with PID 99327 (/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes started by
makit in /Users/makit/git/getting-started-with-spring-boot/demo-web)
2017-02-07 10:58:29.391  INFO 99327 --- [          main] com.example.DemoWebApplication         : No active profile set, falling back to default profiles: default
2017-02-07 10:58:29.456  INFO 99327 --- [          main] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@4b9e255: startup date [Tue Feb 07 10:58:29 JST 2017];
root of context hierarchy
2017-02-07 10:58:30.167  INFO 99327 --- [          main] trationDelegate$BeanPostProcessorChecker : Bean 'org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration' of type [class
org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 10:58:30.230  INFO 99327 --- [          main] trationDelegate$BeanPostProcessorChecker : Bean 'validator' of type [class org.springframework.validation.beanvalidation.LocalValidatorFactoryBean] is not eligible for getting processed by all
BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 10:58:30.464  INFO 99327 --- [          main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with port(s): 8080 (http)
2017-02-07 10:58:30.478  INFO 99327 --- [          main] o.apache.catalina.core.StandardService   : Starting service Tomcat
2017-02-07 10:58:30.479  INFO 99327 --- [          main] org.apache.catalina.core.StandardEngine  : Starting Servlet Engine: Apache Tomcat/8.5.11
2017-02-07 10:58:30.564  INFO 99327 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring embedded WebApplicationContext
2017-02-07 10:58:30.564  INFO 99327 --- [ost-startStop-1] o.s.web.context.ContextLoader            : Root WebApplicationContext: initialization completed in 1113 ms
2017-02-07 10:58:30.691  INFO 99327 --- [ost-startStop-1] o.s.b.w.servlet.ServletRegistrationBean  : Mapping servlet: 'dispatcherServlet' to [/]
2017-02-07 10:58:30.696  INFO 99327 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'characterEncodingFilter' to: [/*]
2017-02-07 10:58:30.697  INFO 99327 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
2017-02-07 10:58:30.697  INFO 99327 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'httpPutFormContentFilter' to: [/*]
2017-02-07 10:58:30.697  INFO 99327 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'requestContextFilter' to: [/*]
2017-02-07 10:58:30.990  INFO 99327 --- [          main] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@4b9e255: startup date [Tue Feb 07
10:58:29 JST 2017]; root of context hierarchy
2017-02-07 10:58:31.064  INFO 99327 --- [          main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/],methods=[GET]}" onto java.lang.String com.example.DemoWebApplication.hello()

2017-02-07 10:58:31.067  INFO 99327 --- [          main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/cities],methods=[GET]}" onto
java.util.List<com.example.City> com.example.CityController.getCities()
2017-02-07 10:58:31.067  INFO 99327 --- [          main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/cities],methods=[POST]}" onto
com.example.City com.example.CityController.postCities(com.example.City)
2017-02-07 10:58:31.070  INFO 99327 --- [          main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error]}" onto public org.springframework.http.ResponseEntity<java.util.Map<java.lang.String, java.lang.Object>>
org.springframework.boot.autoconfigure.web.BasicErrorController.error(javax.servlet.http.HttpServletRequest)
2017-02-07 10:58:31.070  INFO 99327 --- [          main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error],produces=[text/html]}" onto public org.springframework.web.servlet.ModelAndView
org.springframework.boot.autoconfigure.web.BasicErrorController.errorHtml(javax.servlet.http.HttpServletRequest,javax.servlet.http.HttpServletResponse)
2017-02-07 10:58:31.107  INFO 99327 --- [          main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/webjars/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 10:58:31.108  INFO 99327 --- [          main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 10:58:31.156  INFO 99327 --- [          main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 10:58:31.311  INFO 99327 --- [          main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
2017-02-07 10:58:31.394  INFO 99327 --- [          main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s): 8080 (http)
2017-02-07 10:58:31.400  INFO 99327 --- [          main] com.example.DemoWebApplication         : Started DemoWebApplication in 2.279 seconds (JVM running for 2.572)
```

Access REST API

```
$ curl -X GET http://localhost:8080/cities
[]
$ curl -X POST http://localhost:8080/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Tokyo¥"}"
{"id":1,"name":"Tokyo"}
$ curl -X POST http://localhost:8080/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Osaka¥"}"
{"id":2,"name":"Osaka"}
$ curl -X GET http://localhost:8080/cities
[{"id":1,"name":"Tokyo"},{"id":2,"name":"Osaka"}]
```

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Build the application

```
$ cd demo-web
$ ./mvnw clean package -Dmaven.test.skip=true
$ java -jar target/demo-web-0.0.1-SNAPSHOT.jar
```

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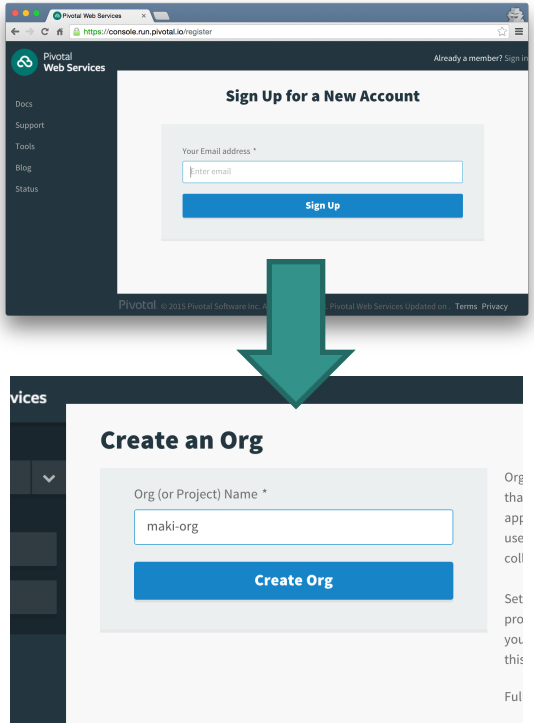
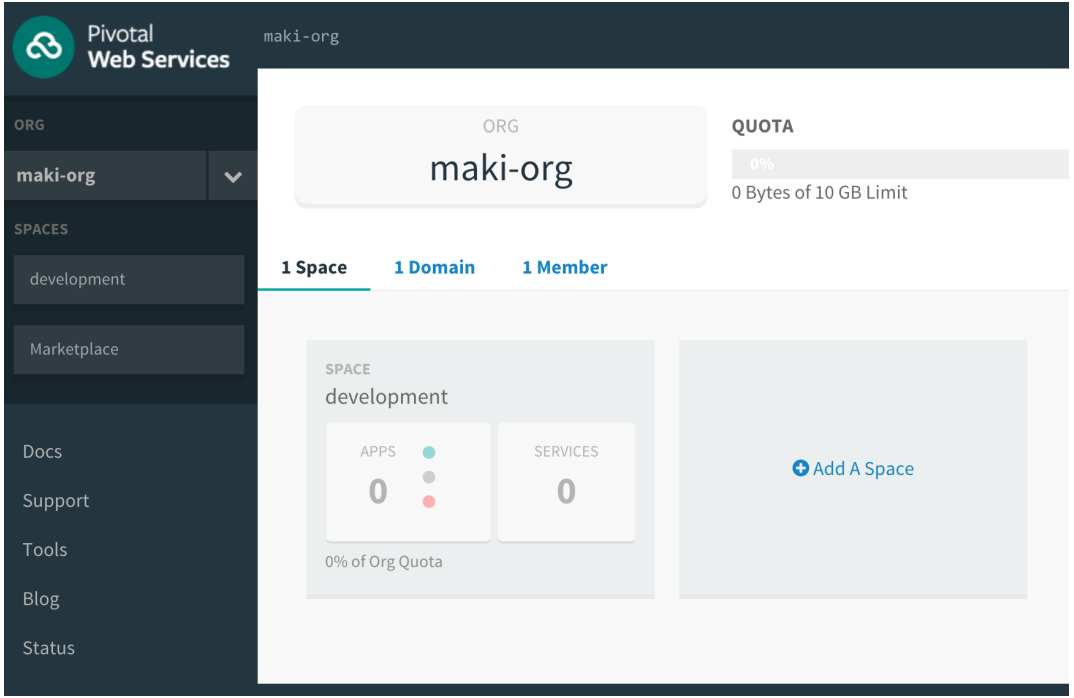
Push to Cloud Foundry

https://console.run.pivotal.io/register





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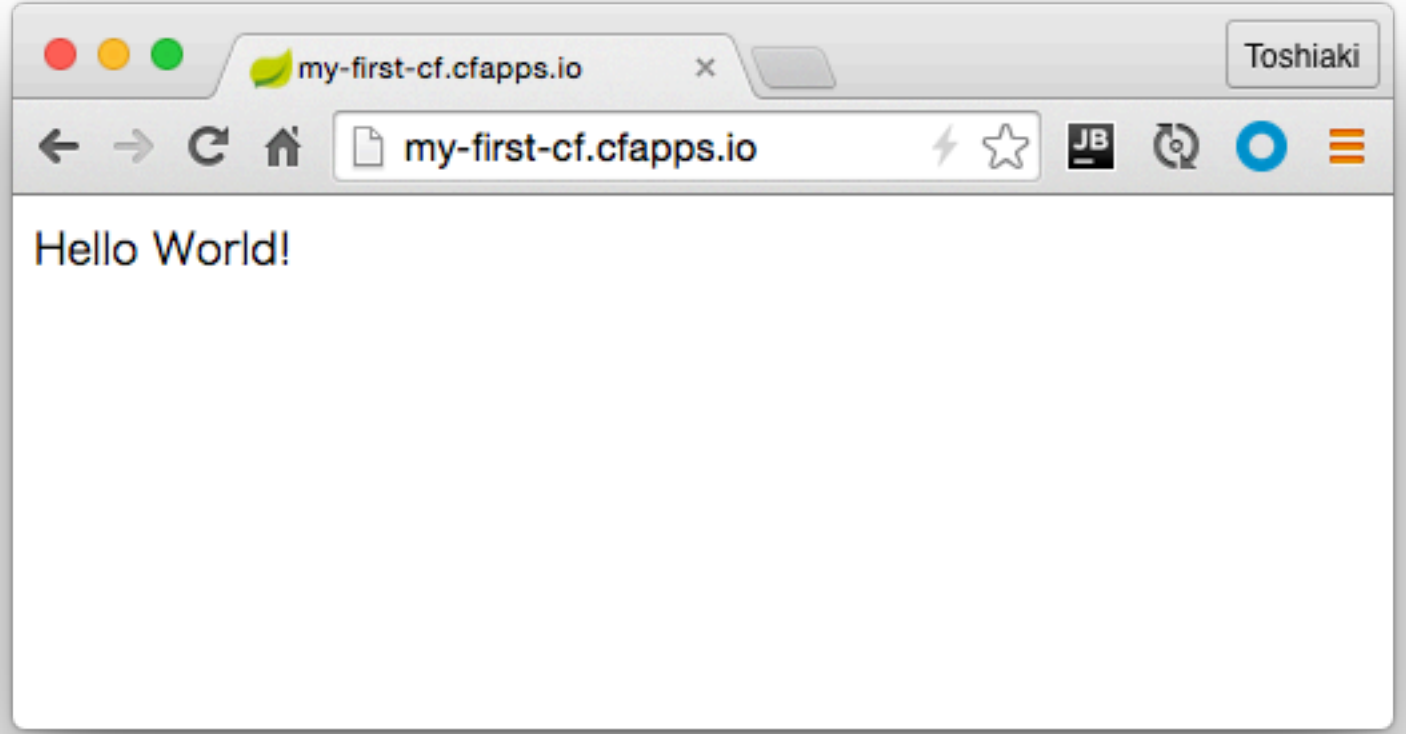
Push to Cloud Foundry

```
$ cf login -a api.run.pivotal.io
$ cf push my-first-cf -p target/demo-web-0.0.1-SNAPSHOT.jar
Showing health and status for app my-first-cf in org maki-org / space development as
foo@example.com ...
OK

requested state: started
instances: 1/1
usage: 1G x 1 instances
urls: my-first-cf.cfapps.io
last uploaded: Wed Feb 3 04:08:46 UTC 2016
stack: cflinuxfs2
buildpack: java-buildpack=v3.5.1-http://github.com/pivotal-cf/pcf-java-
buildpack.git#d6c19f8 java-main open-jdk-like-jre=1.8.0_71 open-jdk-like-memory-
calculator=2.0.1_RELEASE spring-auto-reconfiguration=1.10.0_RELEASE

     state     since                    cpu     memory          disk           details
#0   running   2016-02-03 01:14:12 PM   38.6%   378.2M of 1G    135.8M of 1G
```



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Database Access

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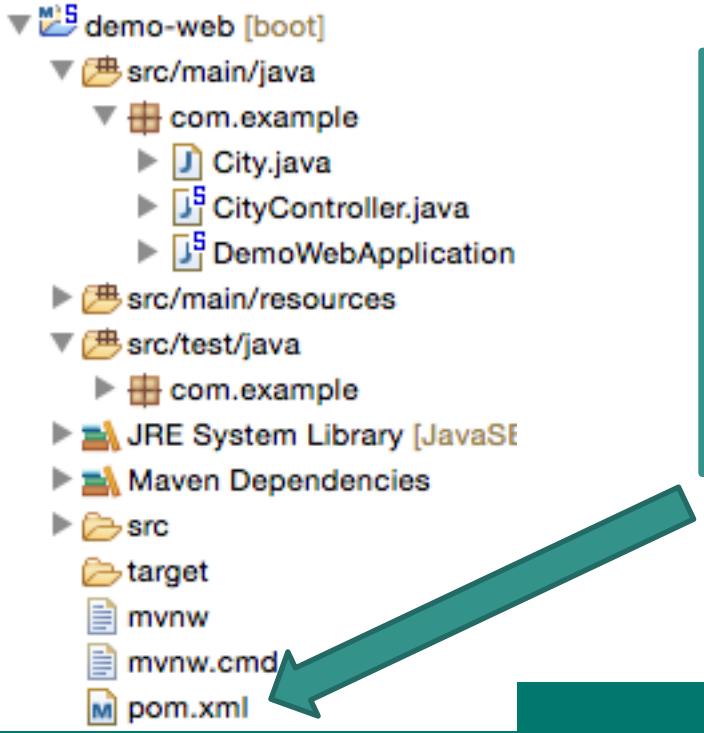
Add dependencies



Add

```
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-jdbc</artifactId>
</dependency>
<dependency>
  <groupId>com.h2database</groupId>
  <artifactId>h2</artifactId>
  <scope>runtime</scope>
</dependency>
```

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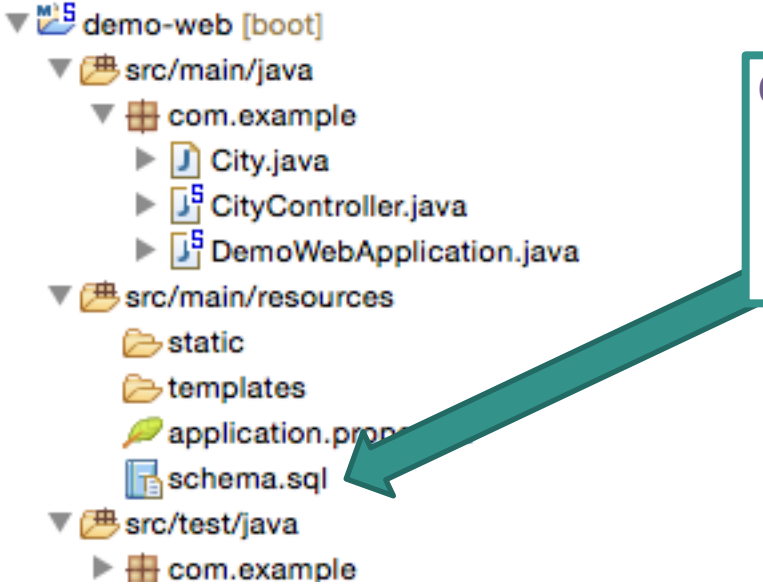
Use JdbcTemplate

```
@RestController
public class CityController {
  @Autowired
  JdbcTemplate jdbcTemplate;
  @GetMapping("/cities")
  List<City> getCities() {
    return jdbcTemplate.query("SELECT id, name FROM city ORDER BY id", (rs, i) -> {
      City city = new City();
      city.setId(rs.getInt("id"));
      city.setName(rs.getString("name"));
      return city;
    });
  }
  @PostMapping("/cities")
  City postCities(@RequestBody City city) {
    jdbcTemplate.update("INSERT INTO city(name) VALUES(?)", city.getName());
    return city;
```

Create DDL file



Create `schema.sql`

```
CREATE TABLE city (
  id   INT PRIMARY KEY AUTO_INCREMENT,
  name VARCHAR(255)
);
```

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Re-Run & Access API (03-01)

```
  .   ____          _            __ _ _
 /¥¥ / ___'_ __ _ _(_)_ __  __ _ ¥ ¥ ¥ ¥
( ( )¥___ | '_ | '_| | '_ ¥/ _` | ¥ ¥ ¥ ¥
 ¥¥/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_¥__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 11:11:16.290  INFO 1795 --- [           main] com.example.DemoWebApplication           : Starting DemoWebApplication on jpxxmakitm1.corp.emc.com with PID 1795 (/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes started by
makit in /Users/makit/git/getting-started-with-spring-boot/demo-web)
2017-02-07 11:11:16.294  INFO 1795 --- [           main] com.example.DemoWebApplication           : No active profile set, falling back to default profiles: default
2017-02-07 11:11:16.351  INFO 1795 --- [           main] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@3439f68d: startup date [Tue Feb 07 11:11:16 JST 2017];
root of context hierarchy
2017-02-07 11:11:17.162  INFO 1795 --- [           main] trationDelegate$BeanPostProcessorChecker : Bean 'org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration' of type [class
org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 11:11:17.219  INFO 1795 --- [           main] trationDelegate$BeanPostProcessorChecker : Bean 'validator' of type [class org.springframework.validation.beanvalidation.LocalValidatorFactoryBean] is not eligible for getting processed by all
BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 11:11:17.243  INFO 1795 --- [           main] trationDelegate$BeanPostProcessorChecker : Bean 'org.springframework.transaction.annotation.ProxyTransactionManagementConfiguration' of type [class
org.springframework.transaction.annotation.ProxyTransactionManagementConfiguration$$EnhancerBySpringCGLIB$$1d099d1d] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 11:11:17.500  INFO 1795 --- [           main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with port(s): 8080 (http)
2017-02-07 11:11:17.512  INFO 1795 --- [           main] o.apache.catalina.core.StandardService   : Starting service Tomcat
2017-02-07 11:11:17.513  INFO 1795 --- [           main] org.apache.catalina.core.StandardEngine  : Starting Servlet Engine: Apache Tomcat/8.5.11
2017-02-07 11:11:17.603  INFO 1795 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring embedded WebApplicationContext
2017-02-07 11:11:17.604  INFO 1795 --- [ost-startStop-1] o.s.web.context.ContextLoader            : Root WebApplicationContext: initialization completed in 1257 ms
2017-02-07 11:11:17.740  INFO 1795 --- [ost-startStop-1] o.s.b.w.servlet.ServletRegistrationBean  : Mapping servlet: 'dispatcherServlet' to [/]
2017-02-07 11:11:17.744  INFO 1795 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'characterEncodingFilter' to: [/*]
2017-02-07 11:11:17.744  INFO 1795 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
2017-02-07 11:11:17.744  INFO 1795 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'httpPutFormContentFilter' to: [/*]
2017-02-07 11:11:17.745  INFO 1795 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'requestContextFilter' to: [/*]

2017-02-07 11:11:18.182  INFO 1795 --- [           main] o.s.jdbc.datasource.init.ScriptUtils     : Executing SQL script from URL [file:/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes/schema.sql]

2017-02-07 11:11:18.196  INFO 1795 --- [           main] o.s.jdbc.datasource.init.ScriptUtils     : Executed SQL script from URL [file:/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes/schema.sql] in 14 ms.
2017-02-07 11:11:18.489  INFO 1795 --- [           main] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@3439f68d: startup date [Tue Feb 07
11:11:16 JST 2017]; root of context hierarchy
2017-02-07 11:11:18.544  INFO 1795 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/],methods=[GET]}" onto java.lang.String com.example.DemoWebApplication.hello()
2017-02-07 11:11:18.547  INFO 1795 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/cities],methods=[GET]}" onto java.util.List<com.example.City> com.example.CityController.getCities()
2017-02-07 11:11:18.548  INFO 1795 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/cities],methods=[POST]}" onto com.example.City com.example.CityController.postCities(com.example.City)
2017-02-07 11:11:18.550  INFO 1795 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error]}" onto public org.springframework.http.ResponseEntity<java.util.Map<java.lang.String, java.lang.Object>>
org.springframework.boot.autoconfigure.web.BasicErrorController.error(javax.servlet.http.HttpServletRequest)
2017-02-07 11:11:18.551  INFO 1795 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error],produces=[text/html]}" onto public org.springframework.web.servlet.ModelAndView
org.springframework.boot.autoconfigure.web.BasicErrorController.errorHtml(javax.servlet.http.HttpServletRequest,javax.servlet.http.HttpServletResponse)
2017-02-07 11:11:18.575  INFO 1795 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/webjars/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 11:11:18.576  INFO 1795 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 11:11:18.612  INFO 1795 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 11:11:18.817  INFO 1795 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
2017-02-07 11:11:18.869  INFO 1795 --- [           main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s): 8080 (http)
2017-02-07 11:11:18.876  INFO 1795 --- [           main] com.example.DemoWebApplication           : Started DemoWebApplication in 2.848 seconds (JVM running for 3.143)
```

Re-Run & Access API (03-01)

```
$ curl -X GET http://localhost:8080/cities
[]
$ curl -X POST http://localhost:8080/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Tokyo¥"}"
{"id":null,"name":"Tokyo"}
$ curl -X POST http://localhost:8080/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Osaka¥"}"
{"id":null,"name":"Osaka"}
$ curl -X GET http://localhost:8080/cities
[{"id":1,"name":"Tokyo"},{"id":2,"name":"Osaka"}]
```

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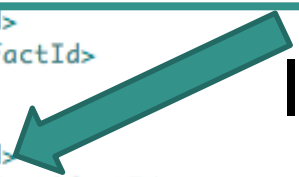
Use Spring Data JPA

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



Instead of `starter-jdbc`

```
<dependencies>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-data-jpa</artifactId>
    </dependency>
    <dependency>
        <groupId>com.h2database</groupId>
        <artifactId>h2</artifactId>
        <scope>runtime</scope>
    </dependency>

    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-test</artifactId>
        <scope>test</scope>
    </dependency>
</dependencies>
```

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Create JPA's Entity

```
@Entity
public class City {
  @Id
  @GeneratedValue(strategy = GenerationType.IDENTITY)
  private Integer id;
  private String name;
  public Integer getId() {
    return id;
  }
  public void setId(Integer id) {
    this.id = id;
  }
  public String getName() {
    return name;
  }
  public void setName(String name) {
    this.name = name;
  }
}
```

Create Repository

```
package com.example;

import org.springframework.data.jpa.repository.JpaRepository;

public interface CityRepository extends JpaRepository<City, Integer> {

}
```

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Use CityRepository

```
@RestController
public class CityController {
  @Autowired
  CityRepository cityRepository;

  @GetMapping("/cities")
  List<City> getCities() {
    return cityRepository.findAll();
  }

  @PostMapping("/cities")
  City postCities(@RequestBody City city) {
    return cityRepository.save(city);
  }
}
```

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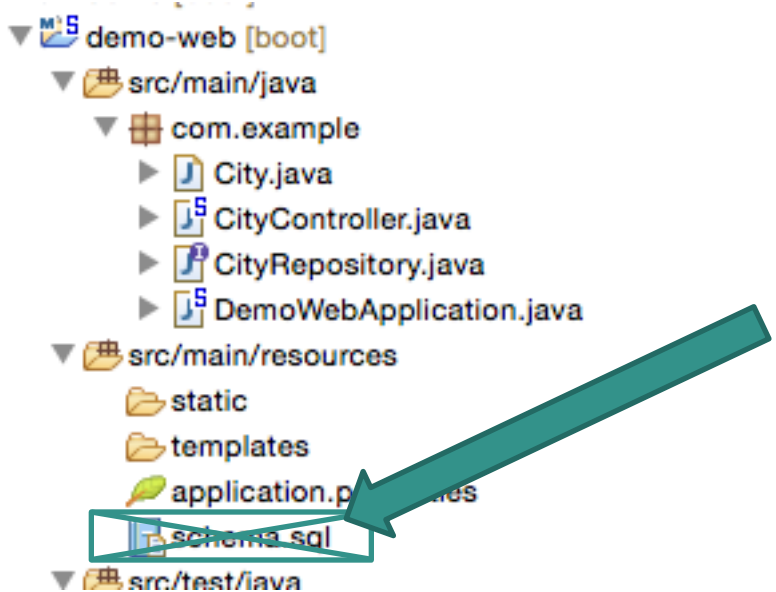
Remove DDL file



Remove `schema.sql`
JPA generates schema automatically

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Re-Run (03-02)

```
  .   ____          _            __ _ _
 /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07 11:17:25.290 INFO 2852 --- [ main] com.example.DemoWebApplicati on : Starting DemoWebApplication on jpxxmakitm1.corp.emc.com with PID 2852 (/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes started by makit in /Users/makit/git/getting-started-with-spring-boot/demo-web)
2017-02-07 11:17:25.295 INFO 2852 --- [ main] com.example.DemoWebApplicati on : No active profile set, falling back to default profiles: default
2017-02-07 11:17:25.353 INFO 2852 --- [ main] ationConfigEmbeddedWebApplic ation : Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@1d021f75: startup date [Tue Feb 07 11:17:25 JST 2017]; root of context hierarchy
2017-02-07 11:17:26.410 INFO 2852 --- [ main] trationDelegate$BeanPostProcesso rChecker : Bean 'org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration' of type [class org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 11:17:26.465 INFO 2852 --- [ main] trationDelegate$BeanPostProcesso rChecker : Bean 'validator' of type [class org.springframework.validation.beanvalidation.LocalValidatorFactoryBean] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 11:17:26.505 INFO 2852 --- [ main] trationDelegate$BeanPostProcesso rChecker : Bean 'org.springframework.transaction.annotation.ProxyTransactionManagementConfiguration' of type [class org.springframework.transaction.annotation.ProxyTransactionManagementConfiguration$$EnhancerBySpringCGLIB$$fc28f54] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2017-02-07 11:17:26.829 INFO 2852 --- [ main] s.b.c.e.t.TomcatEmbeddedServletC ontainer : Tomcat initialized with port(s): 8080 (http)
2017-02-07 11:17:26.844 INFO 2852 --- [ main] o.apache.catalina.core.StandardService : Starting service Tomcat
2017-02-07 11:17:26.846 INFO 2852 --- [ main] org.apache.catalina.core.StandardEngine : Starting Servlet Engine: Apache Tomcat/8.5.11
2017-02-07 11:17:26.975 INFO 2852 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2017-02-07 11:17:26.975 INFO 2852 --- [ost-startStop-1] o.s.web.context.ContextLoader : Root WebApplicationContext: initialization completed in 1625 ms
2017-02-07 11:17:27.163 INFO 2852 --- [ost-startStop-1] o.s.b.w.servlet.ServletRegistrationBean : Mapping servlet: 'dispatcherServlet' to [/]
2017-02-07 11:17:27.169 INFO 2852 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean : Mapping filter: 'characterEncodingFilter' to: [/*]
2017-02-07 11:17:27.170 INFO 2852 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean : Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
2017-02-07 11:17:27.170 INFO 2852 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean : Mapping filter: 'httpPutFormContentFilter' to: [/*]
2017-02-07 11:17:27.170 INFO 2852 --- [ost-startStop-1] o.s.b.w.servlet.FilterRegistrationBean : Mapping filter: 'requestContextFilter' to: [/*]
2017-02-07 11:17:27.740 INFO 2852 --- [ main] j.LocalContainerEntityManagerFactoryBean : Building JPA container EntityManagerFactory for persistence unit 'default'
2017-02-07 11:17:27.761 INFO 2852 --- [ main] o.hibernate.jpa.internal.util.LogHelper : HHH000204: Processing PersistenceUnitInfo [
    name: default
    ...]
2017-02-07 11:17:27.848 INFO 2852 --- [ main] org.hibernate.Version : HHH000412: Hibernate Core {5.0.11.Final}
2017-02-07 11:17:27.849 INFO 2852 --- [ main] org.hibernate.cfg.Environment : HHH000206: hibernate.properties not found
2017-02-07 11:17:27.852 INFO 2852 --- [ main] org.hibernate.cfg.Environment : HHH000021: Bytecode provider name : javassist
2017-02-07 11:17:27.909 INFO 2852 --- [ main] o.hibernate.annotations.common.Version : HCANN000001: Hibernate Commons Annotations {5.0.1.Final}
2017-02-07 11:17:28.002 INFO 2852 --- [ main] org.hibernate.dialect.Dialect : HHH000400: Using dialect: org.hibernate.dialect.H2Dialect
2017-02-07 11:17:28.459 INFO 2852 --- [ main] org.hibernate.tool.hbm2ddl.SchemaExport : HHH000227: Running hbm2ddl schema export
2017-02-07 11:17:28.468 INFO 2852 --- [ main] org.hibernate.tool.hbm2ddl.SchemaExport : HHH000230: Schema export complete
2017-02-07 11:17:28.498 INFO 2852 --- [ main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'default'
2017-02-07 11:17:29.000 INFO 2852 --- [ main] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@1d021f75: startup date [Tue Feb 07 11:17:25 JST 2017]; root of context hierarchy
2017-02-07 11:17:29.082 INFO 2852 --- [ main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/],methods=[GET]}" onto java.lang.String com.example.DemoWebApplication.hello()
2017-02-07 11:17:29.087 INFO 2852 --- [ main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/cities],methods=[POST]}" onto com.example.CityController.postCities(com.example.City)
2017-02-07 11:17:29.087 INFO 2852 --- [ main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/cities],methods=[GET]}" onto java.util.List<com.example.City> com.example.CityController.getCities()
2017-02-07 11:17:29.090 INFO 2852 --- [ main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error]}" onto public org.springframework.http.ResponseEntity<java.util.Map<java.lang.String, java.lang.Object>>
org.springframework.boot.autoconfigure.web.BasicErrorController.error(javax.servlet.http.HttpServletRequest)
2017-02-07 11:17:29.090 INFO 2852 --- [ main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error],produces=[text/html]}" onto public org.springframework.web.servlet.ModelAndView
org.springframework.boot.autoconfigure.web.BasicErrorController.errorHtml(javax.servlet.http.HttpServletRequest,javax.servlet.http.HttpServletResponse)
2017-02-07 11:17:29.129 INFO 2852 --- [ main] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/webjars/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 11:17:29.129 INFO 2852 --- [ main] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 11:17:29.181 INFO 2852 --- [ main] o.s.w.s.handler.SimpleUrlHandlerMapping : Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
2017-02-07 11:17:29.478 INFO 2852 --- [ main] o.s.j.e.a.AnnotationMBeanExporter : Registering beans for JMX exposure on startup
2017-02-07 11:17:29.545 INFO 2852 --- [ main] s.b.c.e.t.TomcatEmbeddedServletC ontainer : Tomcat started on port(s): 8080 (http)
2017-02-07 11:17:29.552 INFO 2852 --- [ main] com.example.DemoWebApplicati on : Started DemoWebApplication in 4.541 seconds (JVM running for 4.875)
```

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Access API

```
$ curl -X GET http://localhost:8080/cities
[]
$ curl -X POST http://localhost:8080/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Tokyo¥"}"
{"id":1,"name":"Tokyo"}
$ curl -X POST http://localhost:8080/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Osaka¥"}"
{"id":2,"name":"Osaka"}
$ curl -X GET http://localhost:8080/cities
[{"id":1,"name":"Tokyo"},{"id":2,"name":"Osaka"}]
```

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Push to Cloud Foundry with PostgreSQL

```
$ mvn clean package -Dmaven.test.skip=true
$ cf push my-second-cf -p target/demo-web-0.0.1-SNAPSHOT.jar --no-start
$ cf create-service elephantsql turtle demo-pg
$ cf bind-service my-second-cf demo-pg
$ cf set-env my-second-cf spring.jpa.hibernate.ddl-auto update
$ cf start my-second-cf
```

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Push to Cloud Foundry with PostgreSQL

```
Starting app my-second-cf in org maki-org / space development as
...
Creating container
Successfully created container
Downloading app package...
Downloaded app package (23.3M)
Staging...
-----> Java Buildpack Version: v3.5.1 | http://github.com/pivotal-cf/pcf-java-buildpack.git#d6c19f8
-----> Downloading Open Jdk JRE 1.8.0_71 from https://download.run.pivotal.io/openjdk/trusty/x86_64/openjdk-1.8.0_71.tar.gz
(1.0s)
       Expanding Open Jdk JRE to .java-buildpack/open_jdk_jre (1.0s)
-----> Downloading Open JDK Like Memory Calculator 2.0.1_RELEASE from https://download.run.pivotal.io/memory-
calculator/trusty/x86_64/memory-calculator-2.0.1_RELEASE.tar.gz (0.0s)
       Memory Settings: -Xss1M -Xmx768M -XX:MaxMetaspaceSize=104857K -Xms768M -XX:MetaspaceSize=104857K
-----> Downloading Postgresql JDBC 9.4.1207 from
https://download.run.pivotal.io/postgresql-jdbc/postgresql-jdbc-9.4.1207.jar (0.0s)
-----> Downloading Spring Auto Reconfiguration 1.10.0_RELEASE from https://download.run.pivotal.io/auto-reconfiguration/auto-
reconfiguration-1.10.0_RELEASE.jar (0.0s)
Exit status 0
Staging complete
Uploading droplet, build artifacts cache...
Uploading droplet...
Uploading build artifacts cache...
Uploaded build artifacts cache (45.3M)
Uploaded droplet (68.8M)
Uploading complete
```

Push to Cloud Foundry with PostgreSQL

```
$ cf logs my-second-cf --recent
```

```
...
2016-02-03T17:31:59.79+0000 [APP/0]      OUT
2016-02-03T17:31:59.79+0000 [APP/0]      OUT  .   ____          _            __ _ _
2016-02-03T17:31:59.79+0000 [APP/0]      OUT /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
2016-02-03T17:31:59.79+0000 [APP/0]      OUT ( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
2016-02-03T17:31:59.79+0000 [APP/0]      OUT  \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
2016-02-03T17:31:59.79+0000 [APP/0]      OUT   '  |____| .__|_| |_|_| |_\__, | / / / /
2016-02-03T17:31:59.79+0000 [APP/0]      OUT  =========|_|==============|___/=/_/_/_/
2016-02-03T17:31:59.79+0000 [APP/0]      OUT  :: Spring Boot ::        (v1.3.2.RELEASE)
2016-02-03T17:31:59.47+0000 [APP/0]      OUT 2016-02-03 08:31:59.469  INFO 17 --- [           main] pertySourceApplicationContextInitializer : Adding 'cloud' PropertySource to ApplicationContext
2016-02-03T17:31:59.48+0000 [APP/0]      OUT 2016-02-03 08:31:59.848  INFO 17 --- [           main] nfigurationApplicationContextInitializer : Adding cloud service auto-reconfiguration to ApplicationContext
2016-02-03T17:31:59.48+0000 [APP/0]      OUT 2016-02-03 08:31:59.852  INFO 17 --- [           main] com.example.DemoWebApplication           : Starting DemoWebApplication on 9d9a2c14cb44 with PID 17 (/home/vcap/app started by vcap in /home/vcap/app)
2016-02-03T17:31:59.48+0000 [APP/0]      OUT 2016-02-03 08:31:59.863  INFO 17 --- [           main] com.example.DemoWebApplication           : The following profiles are active: cloud
2016-02-03T17:31:59.48+0000 [APP/0]      OUT 2016-02-03 08:31:59.863  INFO 17 --- [           main] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@5f ef06582: startup date [Wed Feb 03 08:31:00 UTC 2016]; root of context hierarchy
2016-02-03T17:31:01.45+0000 [APP/0]      OUT 2016-02-03 08:31:01.454  INFO 17 --- [           main] o.s.b.f.s.DefaultListableBeanFactory     : Overriding bean definition for bean 'beanNameViewResolver' with a different definition: replacing [Root bean: class [null]; scope=; abstract=false; lazyInit=false; autowireMode=3; dependencyCheck=0; autowireCandidate=true; primary=false; factoryBeanName=org.springframework.boot.au toconfig.OrderedWebMvcAutoConfiguration$WebMvcAutoConfigurationAdapter; factoryMethodName=beanNameViewResolver; initMethodName=null; destroyMethodName=(inferred); defined in class path resource [org/springframework/boot/autoconfigure/web/OrderedWebMvcAutoConfiguration$WebMvcAutoConfigurationAdapter.class] with [Root bean: class [null]; scope=; abstract=false; lazyInit=false; autowireMode=3; dependencyCheck=0; autowireCandidate=true; primary=false; factoryBeanName=org.springframework.boot.au toconfig.orm.web.WebMvcAutoConfiguration$WebMvcAutoConfigurationAdapter; factoryMethodName=beanNameViewResolver; initMethodName=null; destroyMethodName=(inferred); defined in class path resource [org/springframework/boot/autoconfigure/web/OrderedWebMvcAutoConfiguration$WebMvcAutoConfigurationAdapter.class]]

2016-02-03T17:31:01.95+0000 [APP/0]      OUT 2016-02-03 08:31:01.954  INFO 17 --- [           main] urceCloudServiceBeanFactoryPostProcessor : Auto-reconfiguring beans of type javax.sql.DataSource

2016-02-03T17:31:01.97+0000 [APP/0]      OUT 2016-02-03 08:31:01.977  INFO 17 --- [           main] o.c.r.c.s.c.s.r.PooledDataSourceCreator  : Found Tomcat high-performance connection pool on the classpath. Using it for DataSource connection pooling.

2016-02-03T17:31:02.02+0000 [APP/0]      OUT 2016-02-03 08:31:02.017  INFO 17 --- [           main] urceCloudServiceBeanFactoryPostProcessor : Reconfigured bean dataSource into singleton service connector
org.apache.tomcat.jdbc.pool.DataSource@5837583a{ConnectionPool[defaultAutoCommit=null; defaultReadOnly=null; defaultTransactionIsolation=-1; defaultCatalog=null;
driverClassName=org.postgresql.Driver; maxActive=4; maxIdle=100; minIdle=0; initialSize=0; maxWait=30000; testOnBorrow=true; testOnReturn=false;
timeBetweenEvictionRunsMillis=5000; numTestsPerEvictionRun=0; minEvictableIdleTimeMillis=60000; testWhileIdle=false; testOnConnect=false; password=********;
url=jdbc:postgresql://pellefant-01.db.elephantsql.com:5432/qttknhee?user=qttknhee&password=3TPD1LUSPJF9PhxtRowA1kkn3gr0-dE3; username=null; validationQuery=SELECT
1; validationQueryTimeout=-1; validatorClassName=null; validationInterval=30000; accessToUnderlyingConnectionAllowed=true; removeAbandoned=false;
removeAbandonedTimeout=60; logAbandoned=false; connectionProperties=null; initSQL=null; jdbcInterceptors=null; jmxEnabled=true; fairQueue=true; useEquals=true;
abandonWhenPercentageFull=0; maxAge=0; useLock=false; dataSource=null; dataSourceJNDI=null; suspectTimeout=0; alternateUsernameAllowed=false;
commitOnReturn=false; rollbackOnReturn=false; useDisposableConnectionFacade=true; logValidationErrors=false; propagateInterruptState=false;
ignoreExceptionOnPreLoad=false; }

2016-02-03T17:31:02.02+0000 [APP/0]      OUT 2016-02-03 08:31:02.020  INFO 17 --- [           main] neCloudServiceBeanFactoryPostProcessor : Auto-reconfiguring beans of type org.springframework.orm.hibernate4.AbstractSessionF actoryBe an
2016-02-03T17:31:02.02+0000 [APP/0]      OUT 2016-02-03 08:31:02.022  INFO 17 --- [           main] neCloudServiceBeanFactoryPostProcessor : Auto-reconfiguring beans of type org.springframework.orm.hibernate4.LocalSes sionFact oryBean
2016-02-03T17:31:02.02+0000 [APP/0]      OUT 2016-02-03 08:31:02.023  INFO 17 --- [           main] neCloudServiceBeanFactoryPostProcessor : Auto-reconfiguring beans of type org.springframework.orm.jpa.AbstractEntityM anagerFa ctoryBea n
2016-02-03T17:31:02.20+0000 [APP/0]      OUT 2016-02-03 08:31:02.204  INFO 17 --- [           main] trationDelegate$BeanPostProcessorChecker : Bean 'org.springframework.transaction.annotation.Pro xyTransa ctionMan agement' configura tion' of type [class org.springframework.transaction.annotation. ProxyTra nsactionMana gement$$EnhancerBy CGLIB$$ 1ce61dd3 ] is not eligible for getting processed by all BeanPostProcessors (for example: not eligible for auto-proxying)
2016-02-03T17:31:02.96+0000 [APP/0]      OUT 2016-02-03 08:31:02.944  INFO 17 --- [           main] o.s.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with port(s): 8080 (http)
2016-02-03T17:31:02.96+0000 [APP/0]      OUT 2016-02-03 08:31:02.963  INFO 17 --- [           main] o.apache.catalina.core.StandardService   : Starting service Tomcat
2016-02-03T17:31:02.96+0000 [APP/0]      OUT 2016-02-03 08:31:02.963  INFO 17 --- [           main] org.apache.catalina.core.StandardEngine  : Starting Servlet Engine: Apache Tomcat/8.0.30
2016-02-03T17:31:03.12+0000 [APP/0]      OUT 2016-02-03 08:31:03.120  INFO 17 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring embedded WebApplicationContext
2016-02-03T17:31:03.12+0000 [APP/0]      OUT 2016-02-03 08:31:03.120  INFO 17 --- [ost-startStop-1] o.s.web.context.ContextLoader            : Root WebApplicationContext: initialization completed in 3000 ms
2016-02-03T17:31:03.82+0000 [APP/0]      OUT 2016-02-03 08:31:03.818  INFO 17 --- [ost-startStop-1] o.s.b.c.e.ServletRegistrationBean        : Mapping servlet: 'dispatcherServlet' to [/]
2016-02-03T17:31:03.82+0000 [APP/0]      OUT 2016-02-03 08:31:03.827  INFO 17 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean  : Mapping filter: 'characterEncodingFilter' to: [/*]
2016-02-03T17:31:03.82+0000 [APP/0]      OUT 2016-02-03 08:31:03.827  INFO 17 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean  : Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
2016-02-03T17:31:03.82+0000 [APP/0]      OUT 2016-02-03 08:31:03.828  INFO 17 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean  : Mapping filter: 'httpPutFormContentFilter' to: [/*]
2016-02-03T17:31:03.96+0000 [APP/0]      OUT 2016-02-03 08:31:03.963  INFO 17 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean  : Mapping filter: 'requestContextFilter' to: [/*]
2016-02-03T17:31:03.96+0000 [APP/0]      OUT 2016-02-03 08:31:03.964  INFO 17 --- [           main] j.LocalContainerEntityManagerFactoryBean : Building JPA container EntityManagerFactory for persistence unit 'default'
2016-02-03T17:31:03.98+0000 [APP/0]      OUT 2016-02-03 08:31:03.978  INFO 17 --- [           main] o.hibernate.jpa.internal.util.LogHelper : HHH000386: Processing PersistenceUnitInfo [
2016-02-03T17:31:03.98+0000 [APP/0]      OUT         name: default
2016-02-03T17:31:03.98+0000 [APP/0]      OUT         ...]
2016-02-03T17:31:04.15+0000 [APP/0]      OUT 2016-02-03 08:31:04.154  INFO 17 --- [           main] org.hibernate.Version                    : HHH000412: Hibernate Core {4.3.11.Final}
2016-02-03T17:31:04.15+0000 [APP/0]      OUT 2016-02-03 08:31:04.157  INFO 17 --- [           main] org.hibernate.cfg.Environment            : HHH000206: hibernate.properties not found
2016-02-03T17:31:04.16+0000 [APP/0]      OUT 2016-02-03 08:31:04.159  INFO 17 --- [           main] org.hibernate.cfg.Environment            : HHH000021: Bytecode provider name : javassist
2016-02-03T17:31:04.30+0000 [APP/0]      OUT 2016-02-03 08:31:04.310  INFO 17 --- [           main] o.hibernate.annotations.common.Version   : HCANN000001: Hibernate Commons Annotations {4.0.5.Final}

2016-02-03T17:31:05.48+0000 [APP/0]      OUT 2016-02-03 08:31:05.485  INFO 17 --- [           main] org.hibernate.dialect.Dialect            : HHH000400: Using dialect: org.hibernate.dialect.PostgreSQLDialect

2016-02-03T17:31:05.58+0000 [APP/0]      OUT 2016-02-03 08:31:05.588  INFO 17 --- [           main] o.h.e.jdbc.internal.LobCreatorBuilder    : HHH000424: Disabling contextual LOB creation as createClob() method threw error : java.lang.reflect.InvocationTargetExceptio n
2016-02-03T17:31:05.66+0000 [APP/0]      OUT 2016-02-03 08:31:05.662  INFO 17 --- [           main] o.h.h.i.ast.ASTQueryTranslatorFactory    : HHH000397: Using ASTQueryTranslatorFactory

2016-02-03T17:31:05.99+0000 [APP/0]      OUT 2016-02-03 08:31:05.990  INFO 17 --- [           main] org.hibernate.tool.hbm2ddl.SchemaUpdate  : HHH000228: Running hbm2ddl schema update

2016-02-03T17:31:05.99+0000 [APP/0]      OUT 2016-02-03 08:31:05.990  INFO 17 --- [           main] org.hibernate.tool.hbm2ddl.SchemaUpdate  : HHH000102: Fetching database metadata

2016-02-03T17:31:05.99+0000 [APP/0]      OUT 2016-02-03 08:31:05.996  INFO 17 --- [           main] org.hibernate.tool.hbm2ddl.SchemaUpdate  : HHH000396: Updating schema

2016-02-03T17:31:06.00+0000 [APP/0]      OUT 2016-02-03 08:31:06.007  INFO 17 --- [           main] java.sql.DatabaseMetaData                : HHH000262: Table not found: city

2016-02-03T17:31:06.01+0000 [APP/0]      OUT 2016-02-03 08:31:06.010  INFO 17 --- [           main] java.sql.DatabaseMetaData                : HHH000262: Table not found: city

2016-02-03T17:31:06.01+0000 [APP/0]      OUT 2016-02-03 08:31:06.012  INFO 17 --- [           main] java.sql.DatabaseMetaData                : HHH000262: Table not found: city

2016-02-03T17:31:06.01+0000 [APP/0]      OUT 2016-02-03 08:31:06.881  INFO 17 --- [           main] org.hibernate.tool.hbm2ddl.SchemaUpdate  : HHH000232: Schema update complete

2016-02-03T17:31:06.72+0000 [APP/0]      OUT 2016-02-03 08:31:06.725  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.context.embedded.Ann otationC onfigEmb eddedWeb Applicat ionContex t@5af6f582: startup date [Wed Feb 03 08:31:00 UTC 2016]; root of context hierarchy
2016-02-03T17:31:06.81+0000 [APP/0]      OUT 2016-02-03 08:31:06.813  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/]}" onto java.lang.String com.example.DemoWebApplication.hello()
2016-02-03T17:31:06.83+0000 [APP/0]      OUT 2016-02-03 08:31:06.835  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/cities],methods=[GET]}" onto java.util.List<com.example.City> com.example.CityController.getCities()
2016-02-03T17:31:06.83+0000 [APP/0]      OUT 2016-02-03 08:31:06.836  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/cities],methods=[POST]}" onto com.example.City com.example.CityController.postCities(com. example. City)
2016-02-03T17:31:06.83+0000 [APP/0]      OUT 2016-02-03 08:31:06.839  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error],produces=[text/html]}" onto public org.springframework.web.servlet.ModelAndView org.springframework.boot.autoconfigure.web .BasicEr rorContr oller.errorHtml( javax.se rvlet.ht tp.HttpS ervletRe quest,ja vax.serv let.http .HttpSer vletResp onse)
2016-02-03T17:31:06.84+0000 [APP/0]      OUT 2016-02-03 08:31:06.844  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error]}" onto public org.springframework.http.ResponseEntity<java.util.Ma p<java.l ang.Str ing, java.lang.Object>> org.springframework.boot.autoconfigure.we b.BasicE rrorCon troller.e rror(ja vax.serv let.http .HttpSer vletRequ est)
2016-02-03T17:31:06.93+0000 [APP/0]      OUT 2016-02-03 08:31:06.937  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped URL path [/webjars/**] onto handler of type [class org.springframework.web.servlet.resource.R esourceH ttpReque stHandle r]
2016-02-03T17:31:06.93+0000 [APP/0]      OUT 2016-02-03 08:31:06.938  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped URL path [/**] onto handler of type [class org.springframework.web.servlet.resource.R esourceH ttpReque stHandle r]
2016-02-03T17:31:07.01+0000 [APP/0]      OUT 2016-02-03 08:31:07.010  INFO 17 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframework.web.servlet.resource.Reso rceHtpR equestHa ndler]
2016-02-03T17:31:07.07+0000 [APP/0]      OUT 2016-02-03 08:31:07.076  INFO 17 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
2016-02-03T17:31:07.12+0000 [APP/0]      OUT 2016-02-03 08:31:07.126  INFO 17 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Bean with name 'dataSource' has been autodetected for JMX exposure
2016-02-03T17:31:07.12+0000 [APP/0]      OUT 2016-02-03 08:31:07.127  INFO 17 --- [           main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s): 8080 (http)
2016-02-03T17:31:07.15+0000 [APP/0]      OUT 2016-02-03 08:31:07.151  INFO 17 --- [           main] com.example.DemoWebApplication           : Started DemoWebApplication in 8.646 seconds (JVM running for 9.327)
```

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Access API

```
$ curl -X GET http://my-second-cf.cfapps.io/cities
[]
$ curl -X POST http://my-second-cf.cfapps.io/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Tokyo¥"}"
{"id":1,"name":"Tokyo"}
$ curl -X POST http://my-second-cf.cfapps.io/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Osaka¥"}"
{"id":2,"name":"Osaka"}
$ curl -X GET http://my-second-cf.cfapps.io/cities
[{"id":1,"name":"Tokyo"},{"id":2,"name":"Osaka"}]
```

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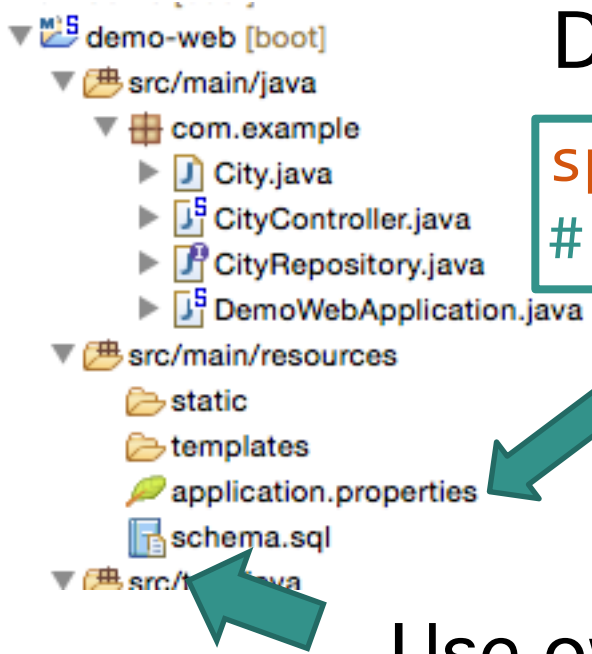
Want to use `schema.sql`?



Disable JPA to generate schema

```
spring.jpa.hibernate.ddl-auto=none
# or validate
```

Use own `schema.sql`

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Re-Run (03-03)

```
  .   ____          _            __ _ _
 /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v1.5.1.RELEASE)

2017-02-07  11:23:40.730   INFO  4086 --- [           main] com.example.DemoWebA ppli cati on                : Starting  DemoWebApplication   on  jpxxmakitm1.corp.emc.c om   with  PID  4086  (/Users/makit/git/getti ng-s tart ed-w ith- spri ng-b oot/ demo -web /tar get/ clas ses   started  by  makit  in /Users/makit/git/get ting -sta rted -wit h-sp ring -
boot/demo-web)
2017-02-07  11:23:40.735   INFO  4086 --- [           main] com.example.DemoWebA ppli cati on                : No  active  profile  set, falling  back  to default  profiles:  default
2017-02-07  11:23:40.844   INFO  4086 --- [           main] ationConfigEmbeddedW ebAp plic atio nCon text    : Refreshing  org.springframework.bo ot.c onte xt.e mbed ded. Anno tati onCo nfig Embe dded WebA ppli cati onCo ntex t@6a 79c2 92:   startup  date  [Tue  Feb  07  11:23:40  JST  2017];  root  of  context  hierarchy
2017-02-07  11:23:42.150   INFO  4086 --- [           main] trationDelegate$Bean Post Proc esso rChe cker    : Bean  'org.springframework .boo t.au toco nfig ure. vali dati on.V alid atio nAut oCon figu rati on'   of  type  [class  org.springframework.b oot. auto conf igur e.va lida tion .Val idat ionA utoC onfi gura tion ]   is  not  eligible  for  getting
processed  by all  BeanPostProcessors   (for  example:  not  eligible  for  auto-proxying)
2017-02-07  11:23:42.231   INFO  4086 --- [           main] trationDelegate$Bean Post Proc esso rChe cker    : Bean  'validator'  of  type  [class  org.springframework.v alid atio n.be anva lida tion .Loc alVa lida torF acto ryBe an]   is  not  eligible  for  getting  processed  by all  BeanPostProcessors  (for  example:  not  eligible  for  auto-proxying)
2017-02-07  11:23:42.295   INFO  4086 --- [           main] trationDelegate$Bean Post Proc esso rChe cker    : Bean  'org.springframework .tra nsac tion .ann otat ion. Prox yTra nsac tion Mana geme ntCo nfig urat ion'   of  type  [class
org.springframework.t rans acti on.a nnot atio n.Pr oxyT rans acti onMa nage ment Conf igur atio n$$E nhan cerB ySpr ingC GLIB $$d0 61fc c9]   is  not  eligible  for  getting  processed  by all  BeanPostProcessors  (for  example:  not  eligible  for  auto-proxying)
2017-02-07  11:23:42.710   INFO  4086 --- [           main] s.b.c.e.t.TomcatEmbe dded Serv letC onta iner    : Tomcat  initialized  with port(s):  8080  (http)
2017-02-07  11:23:42.728   INFO  4086 --- [           main] o.apache.catalina.co re.S tand ardS ervi ce      : Starting  service  Tomcat
2017-02-07  11:23:42.729   INFO  4086 --- [           main] org.apache.catalina. core .Sta ndar dEng ine     : Starting  Servlet  Engine:  Apache  Tomcat/8.5.11
2017-02-07  11:23:42.879   INFO  4086 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[ loca lhos t].[ /]       : Initializing  Spring  embedded  WebApplicationContex t
2017-02-07  11:23:42.879   INFO  4086 --- [ost-startStop-1] o.s.web.context.Cont extL oade r             : Root  WebApplicationContex t:   initialization   completed  in  2043  ms
2017-02-07  11:23:43.084   INFO  4086 --- [ost-startStop-1] o.s.b.w.servlet.Serv letR egis trat ionB ean  : Mapping  servlet:  'dispatcherServlet'   to  [/]
2017-02-07  11:23:43.091   INFO  4086 --- [ost-startStop-1] o.s.b.w.servlet.Filt erRe gist rati onBe an   : Mapping  filter:  'characterEncodingFil ter'   to:  [/*]
2017-02-07  11:23:43.092   INFO  4086 --- [ost-startStop-1] o.s.b.w.servlet.Filt erRe gist rati onBe an   : Mapping  filter:  'hiddenHttpMethodFilt er'   to:  [/*]
2017-02-07  11:23:43.092   INFO  4086 --- [ost-startStop-1] o.s.b.w.servlet.Filt erRe gist rati onBe an   : Mapping  filter:  'httpPutFormContentFi lter '   to:  [/*]
2017-02-07  11:23:43.093   INFO  4086 --- [ost-startStop-1] o.s.b.w.servlet.Filt erRe gist rati onBe an   : Mapping  filter:  'requestContextFilter '   to:  [/*]

2017-02-07  11:23:43.687   INFO  4086 --- [           main] o.s.jdbc.datasource. init .Scr iptU tils         : Executing SQL script from URL [file:/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes/schema.sql]

2017-02-07  11:23:43.702   INFO  4086 --- [           main] o.s.jdbc.datasource. init .Scr iptU tils         : Executed SQL script from URL [file:/Users/makit/git/getting-started-with-spring-boot/demo-web/target/classes/schema.sql] in 14 ms.
2017-02-07  11:23:43.874   INFO  4086 --- [           main] j.LocalContainerEnti tyMa nage rFac tory Bean    : Building  JPA  container  EntityManagerFactory   for  persistence  unit  'default'
2017-02-07  11:23:43.903   INFO  4086 --- [           main] o.hibernate.jpa.inte rnal .uti l.Lo gHel per     : HHH000204:  Processing  PersistenceUnitInfo  [
                    name:  default
                ...]
2017-02-07  11:23:44.010   INFO  4086 --- [           main] org.hibernate.Versio n                           : HHH000412:  Hibernate  Core  {5.0.11.Final}
2017-02-07  11:23:44.012   INFO  4086 --- [           main] org.hibernate.cfg.En viro nmen t                 : HHH000206:  hibernate.properties   not  found
2017-02-07  11:23:44.014   INFO  4086 --- [           main] org.hibernate.cfg.En viro nmen t                 : HHH000021:  Bytecode  provider  name  : javassist
2017-02-07  11:23:44.076   INFO  4086 --- [           main] o.hibernate.annotati ons. comm on.V ersi on      : HCANN000001:  Hibernate  Commons  Annotations  {5.0.1.Final}
2017-02-07  11:23:44.214   INFO  4086 --- [           main] org.hibernate.dialec t.Di alec t                 : HHH000400:  Using  dialect:  org.hibernate.dialect.H 2Dia lect
2017-02-07  11:23:44.883   INFO  4086 --- [           main] j.LocalContainerEnti tyMa nage rFac tory Bean    : Initialized  JPA EntityManagerFactory  for  persistence  unit  'default'
2017-02-07  11:23:45.518   INFO  4086 --- [           main] s.w.s.m.m.a.RequestM appi ngHa ndle rMda pter    : Looking  for  @ControllerAdvice:   org.springframework.bo ot.c onte xt.e mbed ded. Anno tati onCo nfig Embe dded WebA ppli cati onCo ntex t@6a 79c2 92:   startup  date  [Tue  Feb  07  11:23:40  JST  2017];  root  of  context  hierarchy
2017-02-07  11:23:45.632   INFO  4086 --- [           main] s.w.s.m.m.a.RequestM appi ngHa ndle rMap ping    : Mapped  "{[/],methods=[GET]}"   onto  java.lang.String  com.example.DemoWebApp lica tion .hel lo()
2017-02-07  11:23:45.637   INFO  4086 --- [           main] s.w.s.m.m.a.RequestM appi ngHa ndle rMap ping    : Mapped  "{[/cities],methods=[G ET]} "   onto  java.util.List<com.ex ampl e.Ci ty>   com.example.CityCont roll er.g etCi ties ()
2017-02-07  11:23:45.638   INFO  4086 --- [           main] s.w.s.m.m.a.RequestM appi ngHa ndle rMap ping    : Mapped  "{[/cities],methods=[P OST ]}"   onto  com.example.City  com.example.CityControl ler. post Citi es(c om.e xamp le.C ity)
2017-02-07  11:23:45.644   INFO  4086 --- [           main] s.w.s.m.m.a.RequestM appi ngHa ndle rMap ping    : Mapped  "{[/error]}"  onto  public  org.springframework.h ttp. Resp onse Enti ty<j ava. util .Map <jav a.la ng.S trin g,   java.lang.Object>>
org.springframework.b oot. auto conf igur e.we b.Ba sicE rror Cont roll er.e rror (jav ax.s ervl et.h ttp. Http Serv letR eque st)
2017-02-07  11:23:45.645   INFO  4086 --- [           main] s.w.s.m.m.a.RequestM appi ngHa ndle rMap ping    : Mapped  "{[/error],produces=[t ext/ html ]}"   onto  public  org.springframework. web. serv let. Mode lAnd View
org.springframework.b oot. auto conf igur e.we b.Ba sicE rror Cont roll er.e rror Html (jav ax.s ervl et.h ttp. Http Serv letR eque st,j avax .ser vlet .htt p.Ht tpSe rvle tRes pons e)
2017-02-07  11:23:45.701   INFO  4086 --- [           main] o.s.w.s.handler.Simp leUr lHan dler Mapp ing     : Mapped  URL  path  [/webjars/**]   onto  handler  of  type  [class  org.springframework.web .ser vlet .res ourc e.Re sour ceHt tpRe ques tHan dler ]
2017-02-07  11:23:45.701   INFO  4086 --- [           main] o.s.w.s.handler.Simp leUr lHan dler Mapp ing     : Mapped  URL  path  [/**]  onto  handler  of  type  [class  org.springframework.web .ser vlet .res ourc e.Re sour ceHt tpRe ques tHan dler ]
2017-02-07  11:23:45.765   INFO  4086 --- [           main] o.s.w.s.handler.Simp leUr lHan dler Mapp ing     : Mapped  URL  path  [/**/favicon.ico]   onto  handler  of  type  [class  org.springframework.web .ser vlet .res ourc e.Re sour ceHt tpRe ques tHan dler ]
2017-02-07  11:23:46.156   INFO  4086 --- [           main] o.s.j.e.a.Annotation MBea nExp orte r            : Registering  beans  for  JMX  exposure  on  startup
2017-02-07  11:23:46.253   INFO  4086 --- [           main] s.b.c.e.t.TomcatEmbe dded Serv letC onta iner    : Tomcat  started  on port(s):  8080  (http)
2017-02-07  11:23:46.261   INFO  4086 --- [           main] com.example.DemoWebA ppli cati on                : Started  DemoWebApplication   in  5.895  seconds  (JVM  running  for  6.313)
```

Access API

```
$ curl -X GET http://localhost:8080/cities
[]
$ curl -X POST http://localhost:8080/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Tokyo¥"}"
{"id":1,"name":"Tokyo"}
$ curl -X POST http://localhost:8080/cities -H "Content-Type:
application/json" -d "{¥"name¥":¥"Osaka¥"}"
{"id":2,"name":"Osaka"}
$ curl -X GET http://localhost:8080/cities
[{"id":1,"name":"Tokyo"},{"id":2,"name":"Osaka"}]
```

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Add Spring Data REST

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

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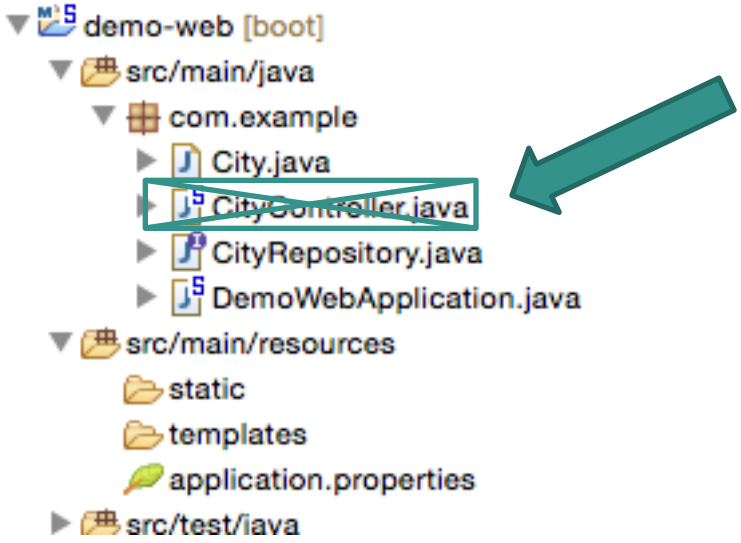
Delete `CityController`



No longer needed

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Re-Run (03-04)

```
...
2017-02-07 11:29:21.832 INFO 5046 --- [ main] o.s.d.r.w.RepositoryRestHandlerMapping : Mapped
"{[/{repository}],methods=[GET],produces=[application/hal+json || application/json || application/*+json;charset=UTF-
8]}" onto public org.springframework.hateoas.Resources<?>
org.springframework.data.rest.webmvc.RepositoryEntityController.getCollectionResource(org.springframework.data.rest.webmvc.RootR
esourceInformation,org.springframework.data.rest.webmvc.support.DefaultedPageable,org.springframework.data.domain.Sort,org.sprin
gframework.data.rest.webmvc.PersistentEntityResourceAssembler) throws
org.springframework.data.rest.webmvc.ResourceNotFoundException,org.springframework.web.HttpRequestMethodNotSupportedException
2017-02-07 11:29:21.833 INFO 5046 --- [ main] o.s.d.r.w.RepositoryRestHandlerMapping : Mapped
"{[/{repository}],methods=[GET],produces=[application/x-spring-data-compact+json || text/uri-list]}" onto
public org.springframework.hateoas.Resources<?>
org.springframework.data.rest.webmvc.RepositoryEntityController.getCollectionResourceCompact(org.springframework.data.rest.webmv
c.RootResourceInformation,org.springframework.data.rest.webmvc.support.DefaultedPageable,org.springframework.data.domain.Sort,or
g.springframework.data.rest.webmvc.PersistentEntityResourceAssembler) throws
org.springframework.data.rest.webmvc.ResourceNotFoundException,org.springframework.web.HttpRequestMethodNotSupportedException
2017-02-07 11:29:21.833 INFO 5046 --- [ main] o.s.d.r.w.RepositoryRestHandlerMapping : Mapped
"{[/{repository}],methods=[POST],produces=[application/hal+json || application/json ||
application/*+json;charset=UTF-8]}" onto public
org.springframework.http.ResponseEntity<org.springframework.hateoas.ResourceSupport>
org.springframework.data.rest.webmvc.RepositoryEntityController.postCollectionResource(org.springframework.data.rest.webmvc.Root
ResourceInformation,org.springframework.data.rest.webmvc.PersistentEntityResource,org.springframework.data.rest.webmvc.Persisten
tEntityResourceAssembler,java.lang.String) throws org.springframework.web.HttpRequestMethodNotSupportedException
...
```

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Spring Boot Actuator

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Add Spring Boot Actuator

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

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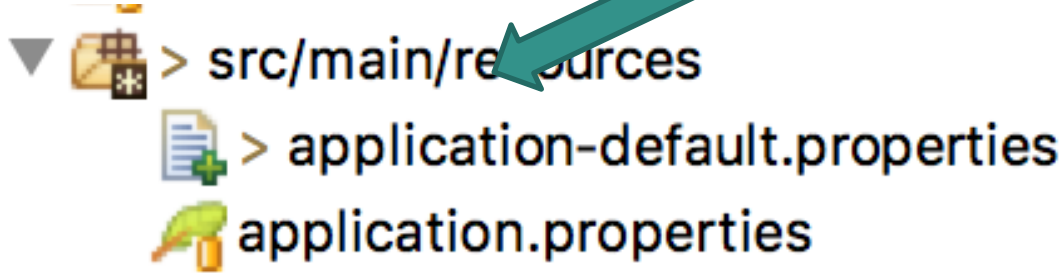
Create new properties




```
management.security.enabled=false
```

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Re-Run

```
2016-02-04 15:32:14.330 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/metrics/{name:.*}],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.MetricsMvcEndpoint.value(java.lang.String)
2016-02-04 15:32:14.330 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/metrics || /metrics.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-02-04 15:32:14.331 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/beans || /beans.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-02-04 15:32:14.331 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/trace || /trace.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-02-04 15:32:14.332 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/health || /health.json],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.HealthMvcEndpoint.invoke(java.security.Principal)
2016-02-04 15:32:14.332 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/info || /info.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-02-04 15:32:14.333 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/autoconfig || /autoconfig.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-02-04 15:32:14.333 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/env/{name:.*}],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EnvironmentMvcEndpoint.value(java.lang.String)
2016-02-04 15:32:14.334 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/env || /env.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-02-04 15:32:14.334 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/actuator || /actuator.json],produces=[application/json]}" onto public org.springframework.hateoas.ResourceSupport org.springframework.boot.actuate.endpoint.mvc.HalJsonMvcEndpoint.links()
2016-02-04 15:32:14.334 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/dump || /dump.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-02-04 15:32:14.335 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/configprops || /configprops.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-02-04 15:32:14.335 INFO 54226 --- [ main] o.s.b.a.e.mvc.EndpointHandlerMapping : Mapped "{[/mappings || /mappings.json],methods=[GET],produces=[application/json]}" onto public java.lang.Object org.springframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
```

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Push to Cloud Foundr

```
$ mvn clean package -Dmaven.test.skip=true
$ cf push my-second-cf -p target/demo-web-0.0.1-SNAPSHOT.jar
```

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Instances

View in PCF Metrics

#	APP HEALTH	CPU	MEMORY	DISK	UPTIME
0	Up	0%	250.17 MB	136.98 MB	24 min

Health Check

View JSON

diskSpace

status: UP
total: 1056858112
free: 913219584
threshold: 10485760

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Transforming How The World Builds Software