



Spring Boot Intro

Michael Inden
Freiberuflicher Consultant und Trainer

Speaker Intro



- Michael Inden, Jahrgang 1971
- Diplom-Informatiker, C.v.O. Uni Oldenburg
- ~8 ¼ Jahre SSE bei Heidelberger Druckmaschinen AG in Kiel
- ~6 ¾ Jahre TPL, SA bei IVU Traffic Technologies AG in Aachen
- ~4 ¼ Jahre LSA / Trainer bei Zühlke Engineering AG in Zürich
- ~3 Jahre TL / CTO bei Direct Mail Informatics / ASMIQ in Zürich
- Freiberuflicher Consultant, Trainer und Konferenz-Speaker
- Autor und Gutachter beim dpunkt.verlag

E-Mail: michael_inden@hotmail.com

Blog: <https://jaxenter.de/author/minden>

<https://www.wearedevelopers.com/magazine/java-records>

Kurse: Bitte sprecht mich an!





Einführung in Spring Boot

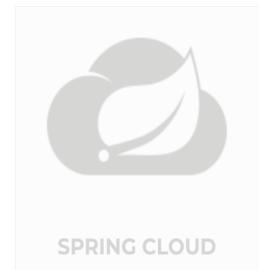
Major Spring Projects



SPRING FRAMEWORK



SPRING BOOT



SPRING CLOUD



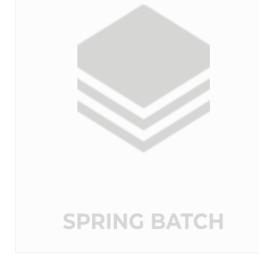
SPRING DATA



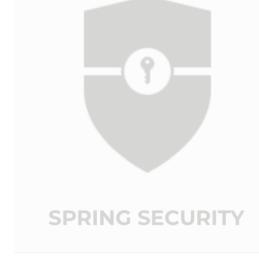
SPRING CLOUD DATA
FLOW



SPRING INTEGRATION



SPRING BATCH



SPRING SECURITY



- RAD – Rapid Application Development
 - Leichte Integration wichtiger Features Web, Security, DB
 - Vordefinierte Abhängigkeiten, die (wirklich) zueinander passen
 - Weniger Konfiguration, kein XML
 - Einfach zu erstellen und auszuführen (Embedded Tomcat)
-

Spring Boot - JDK Baseline



Version	JDK 6	JDK 7	JDK 8	JDK 9	JDK 10	JDK 11	JDK 12
1.5.x	👎👍	👍	👍	👎	👎	👎	👎
2.1.X	👎	👎	👍	👍	👍	👍	👎
2.2.x	👎	👎	👍	👍	👍	👍	👍

WebApp in Spring Framework (The hard way)



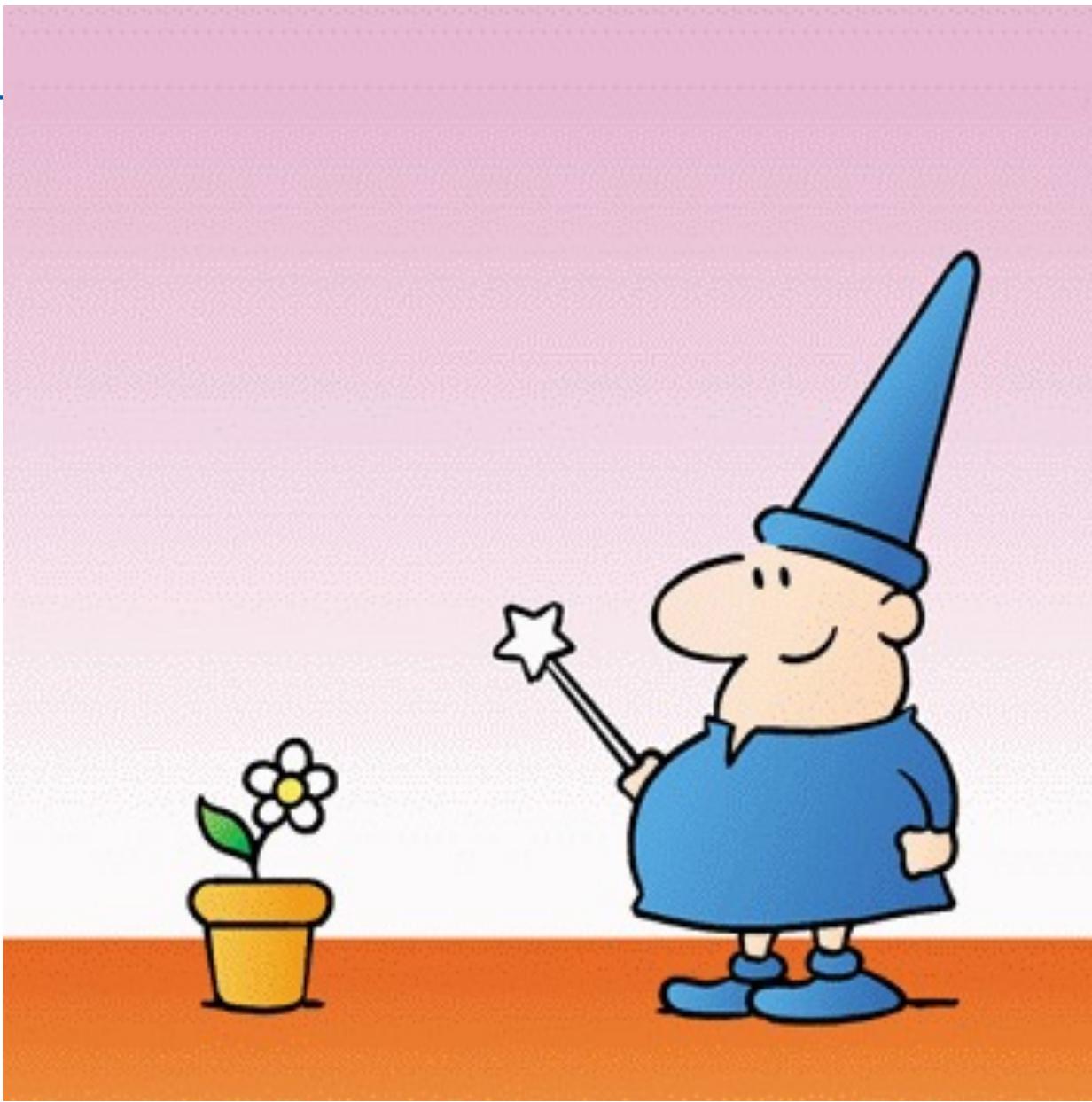
```
public class WebInitializer implements WebApplicationInitializer {  
  
    @Override  
    public void onStartup(ServletContext servletContext) {  
        //configure dispatcher servlet  
    }  
}
```

```
@Configuration  
@EnableWebMvc  
@ComponentScan("ch.karthi")  
public class WebAppConfig {
```

```
@Bean  
public MappingJackson2HttpMessageConverter jsonMessageConverter() {  
    return new MappingJackson2HttpMessageConverter();  
}  
}
```

```
    public static void startTomcat() {  
        final var tomcat = new Tomcat();  
        final var connector = new Connector();  
        //configure tomcat  
    }  
}
```







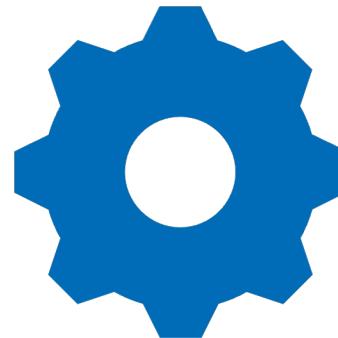
```
@SpringBootApplication  
public class App {  
  
    public static void main(String[] args) {  
        SpringApplication.run(App.class, args);  
    }  
  
}
```

@SpringBootApplication



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

```
@SpringBootApplication  
@Configuration  
@ComponentScan  
@EnableAutoConfiguration
```



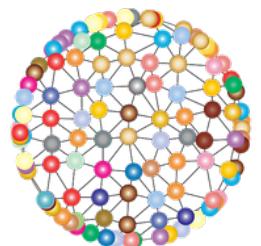
Configures beans automatically
> 100 Autoconfigurations available

Convention over Configuration – Autoconfiguration



Scans the classpath for dependencies and configures automatically





Wie legen wir los?



Nutze den Spring Initializr

Spring Initializr -- <https://start.spring.io/>



 **spring® initializr**

Project Maven Project Gradle Project **Language** Java Kotlin Groovy

Spring Boot
 2.6.0 (SNAPSHOT) 2.6.0 (M3) 2.5.6 (SNAPSHOT) 2.5.5
 2.4.12 (SNAPSHOT) 2.4.11

Project Metadata

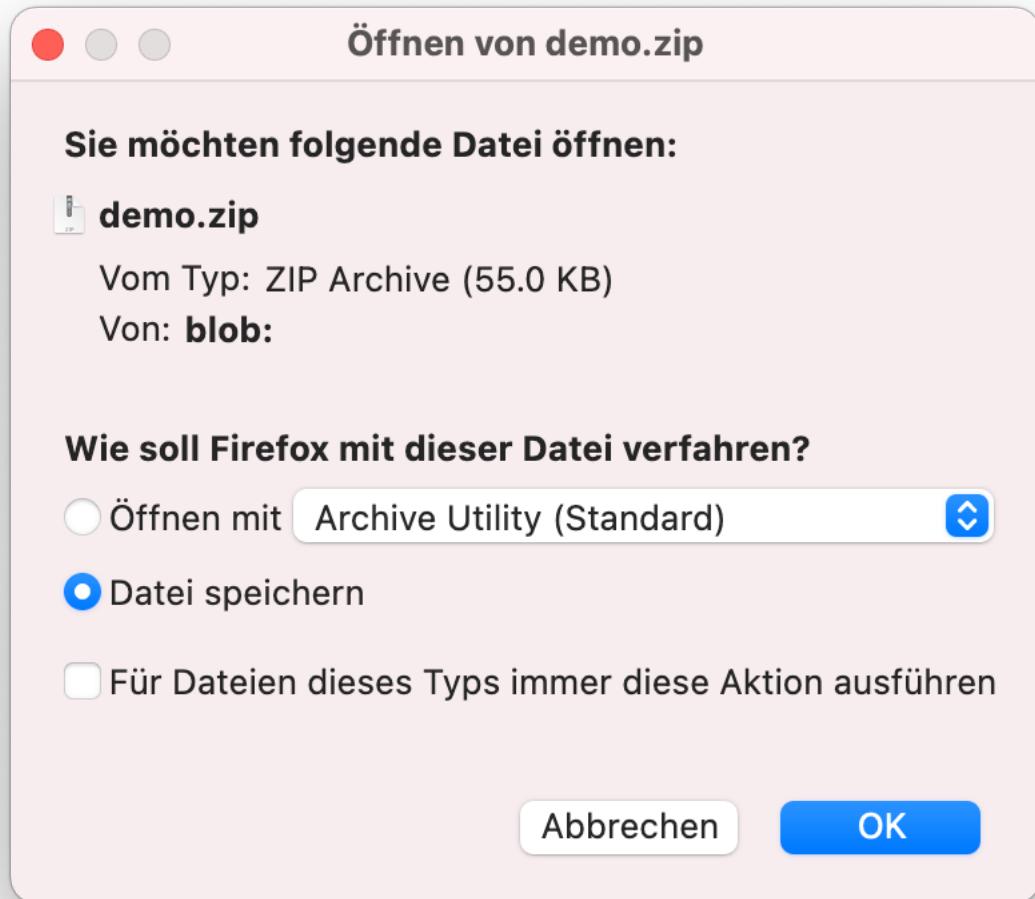
Group	com.example
Artifact	demo
Name	demo
Description	Demo project for Spring Boot
Package name	com.example.demo
Packaging	<input checked="" type="radio"/> Jar <input type="radio"/> War
Java	<input type="radio"/> 17 <input checked="" type="radio"/> 11 <input type="radio"/> 8

Dependencies [ADD DEPENDENCIES... ⌘ + B](#)

No dependency selected

[GENERATE ⌘ + ↩](#) [EXPLORE CTRL + SPACE](#) [SHARE...](#)

Spring Initializr -- <https://start.spring.io/>



▼ demo	-- Ordner
> src	-- Ordner
mvnw	10 KB Ausföh...ix-Datei
mvnw.cmd	7 KB Dokument
> .mvn	-- Ordner
.gitignore	395 Byte Dokument
pom.xml	1 KB XML Text
HELP.md	429 Byte md Datei
demo.zip	56 KB ZIP-Archiv

Spring Initializr -- <https://start.spring.io/>



demo	--
src	--
main	--
java	--
com	--
example	--
demo	--
DemoApplication.java	305 Byte
resources	--
application.properties	1 Byte
test	--
java	--
com	--
example	--
demo	--
DemoApplicationTests.java	206 Byte
mvnw	10 KB
mvnw.cmd	7 KB
.mvn	--
.gitignore	395 Byte
pom.xml	1 KB
HELP.md	429 Byte
demo.zip	56 KB

Spring Initializr -- <https://start.spring.io/>



- ▼ Maven
 - Check out Maven Projects from SCM
 - Existing Maven Projects
 - Install or deploy an artifact to a Maven repository
 - Materialize Maven Binary Project
 - Materialize Maven Projects from SCM

Spring Initializr -- <https://start.spring.io/>



demo

- src/main/java
 - com.example.demo
 - DemoApplication.java
 - DemoApplication
 - main(String[]) : void
- src/main/resources
- src/test/java
- JRE System Library [JavaSE-11]
- Maven Dependencies
- src
- target
- HELP.md
- mvnw
- mvnw.cmd
- pom.xml

```
1 package com.example.demo;
2
3+import org.springframework.boot.SpringApplication;[]
4
5 @SpringBootApplication
6 public class DemoApplication {
7
8
9-     public static void main(String[] args) {
10         SpringApplication.run(DemoApplication.class, args);
11     }
12
13 }
14
```

Applikation starten

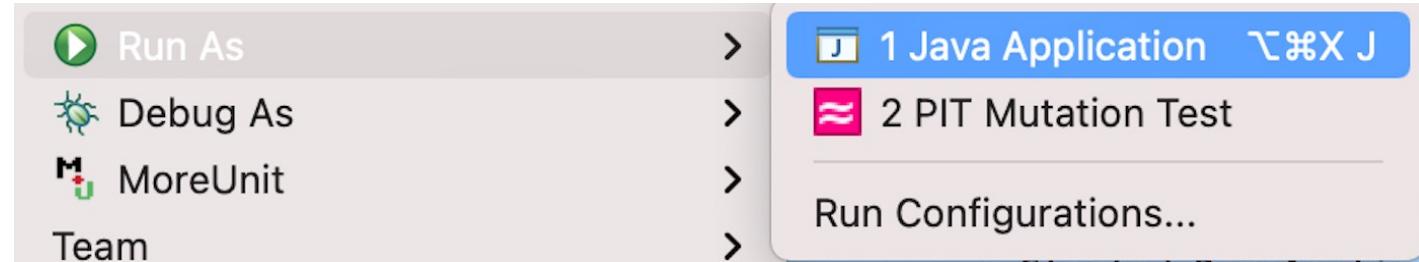


Maven

```
mvn clean package  
mvn spring-boot:run
```

Gradle

```
gradle clean assemble  
gradle bootRun
```



```
( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )  
:: Spring Boot :: (v2.5.5)
```

```
2021-09-28 09:40:15.251 INFO 89058 --- [        main] com.example.demo.DemoApplication
```

```
2021-09-28 09:40:15.254 INFO 89058 --- [        main] com.example.demo.DemoApplication
```

```
2021-09-28 09:40:16.138 INFO 89058 --- [        main] com.example.demo.DemoApplication
```

```
: Starting DemoApplication using Java 11.0.11 on Air-von-Michael.fritz.box  
: No active profile set, falling back to default profiles: default  
: Started DemoApplication in 1.632 seconds (JVM running for 2.289)
```

Getting Started — Maven Dependencies



```
<dependency>
<groupId>org.springframework.boot</groupId>
<artifactId>spring-boot-starter</artifactId>
<version>2.5.5</version>
</dependency>

<dependency>
<groupId>org.springframework.boot</groupId>
<artifactId>spring-boot-starter-test</artifactId>
<version>2.5.5</version>
<scope>test</scope>
</dependency>

<dependency>
<groupId>org.springframework.boot</groupId>
<artifactId>spring-boot-starter-web</artifactId>
<version>2.5.5</version>
</dependency>
```



Erstelle ein Demo Project mit Spring Initializr

<https://start.spring.io/>





RestService
to say
“hello”

```
@SpringBootApplication
public class App {

    public static void main(String[] args) {
        SpringApplication.run(App.class, args);
    }
}

@RestController
public class MyRestController{

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



More REST actions – einfache Filterung

```
http://www.example.com/ <@PathVariable> /? queryParamName = <@RequestParam>
```

```
// "/names?startsWith=<prefix>&endsWith=<postfix>"  
@GetMapping("/names")  
public List<String> names(@RequestParam("startsWith") Optional<String> prefix,  
                           @RequestParam("endsWith") Optional<String> postfix) {  
  
    var filteredResult = Stream.of("Tim", "Tom", "Mike", "Michael", "Jim",  
                                   "John", "James");  
  
    if (prefix.isPresent())  
        filteredResult = filteredResult.filter(str -> str.startsWith(prefix.get()));  
  
    if (postfix.isPresent())  
        filteredResult = filteredResult.filter(str -> str.endsWith(postfix.get()));  
  
    return filteredResult.collect(Collectors.toList());  
}
```



More REST actions

http://www.example.com/ <@PathVariable> /? queryParamName = <@RequestParam>

```
@GetMapping("/items")
public void getItems(){
    ...
}

@GetMapping("/items/{itemId}")
public void getItems(@PathVariable String itemId){
    ...
}

@PostMapping("/items")
public void putItems(@RequestBody ShoppingItem item){
    ...
}
```

SpringBoot mit CommandLineRunner // Alle Beans auflisten

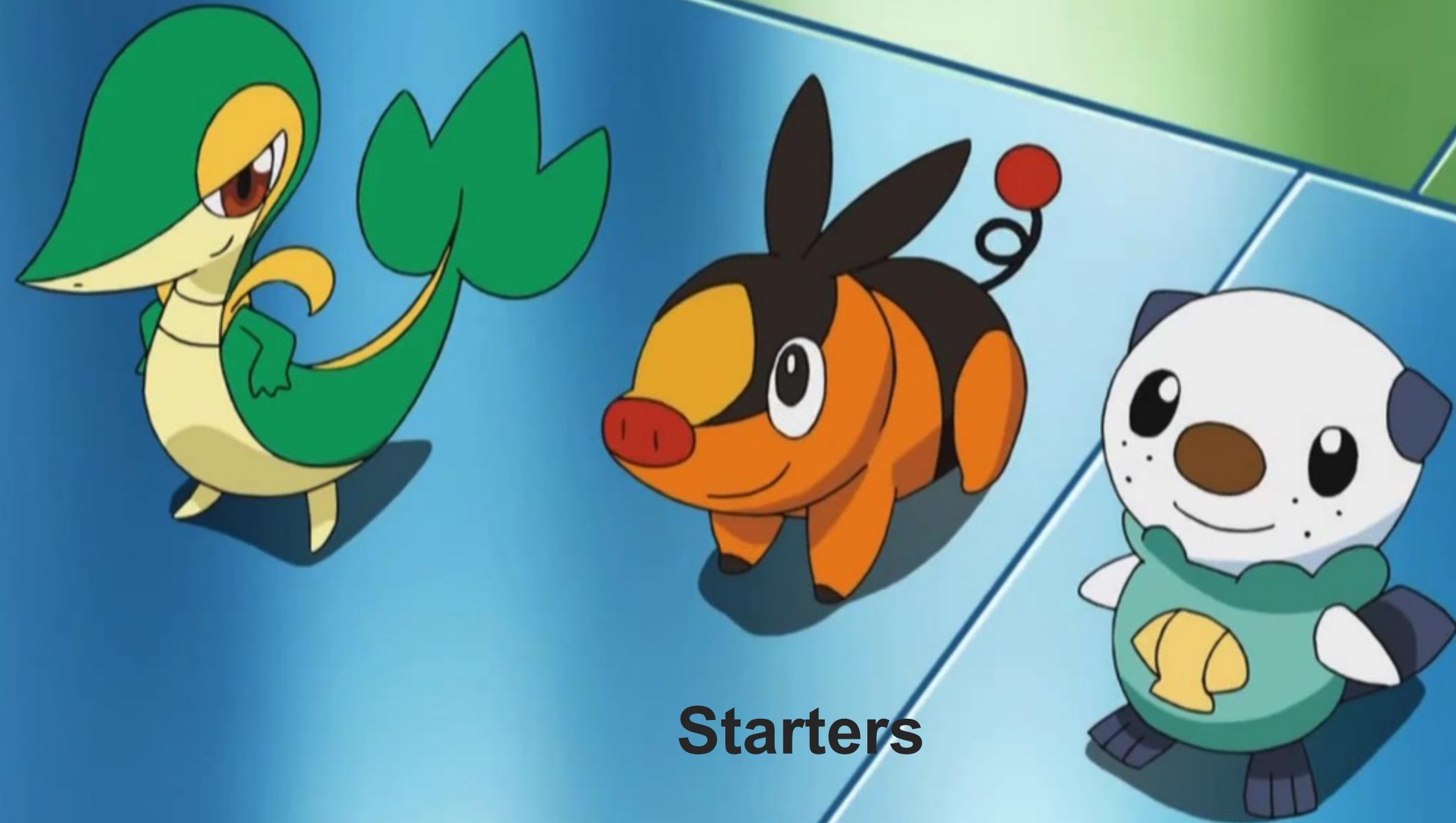


```
@SpringBootApplication
public class ExampleSpringBootApp {

    public static void main(String[] args) {
        SpringApplication.run(ExampleSpringBootApp.class, args);
    }

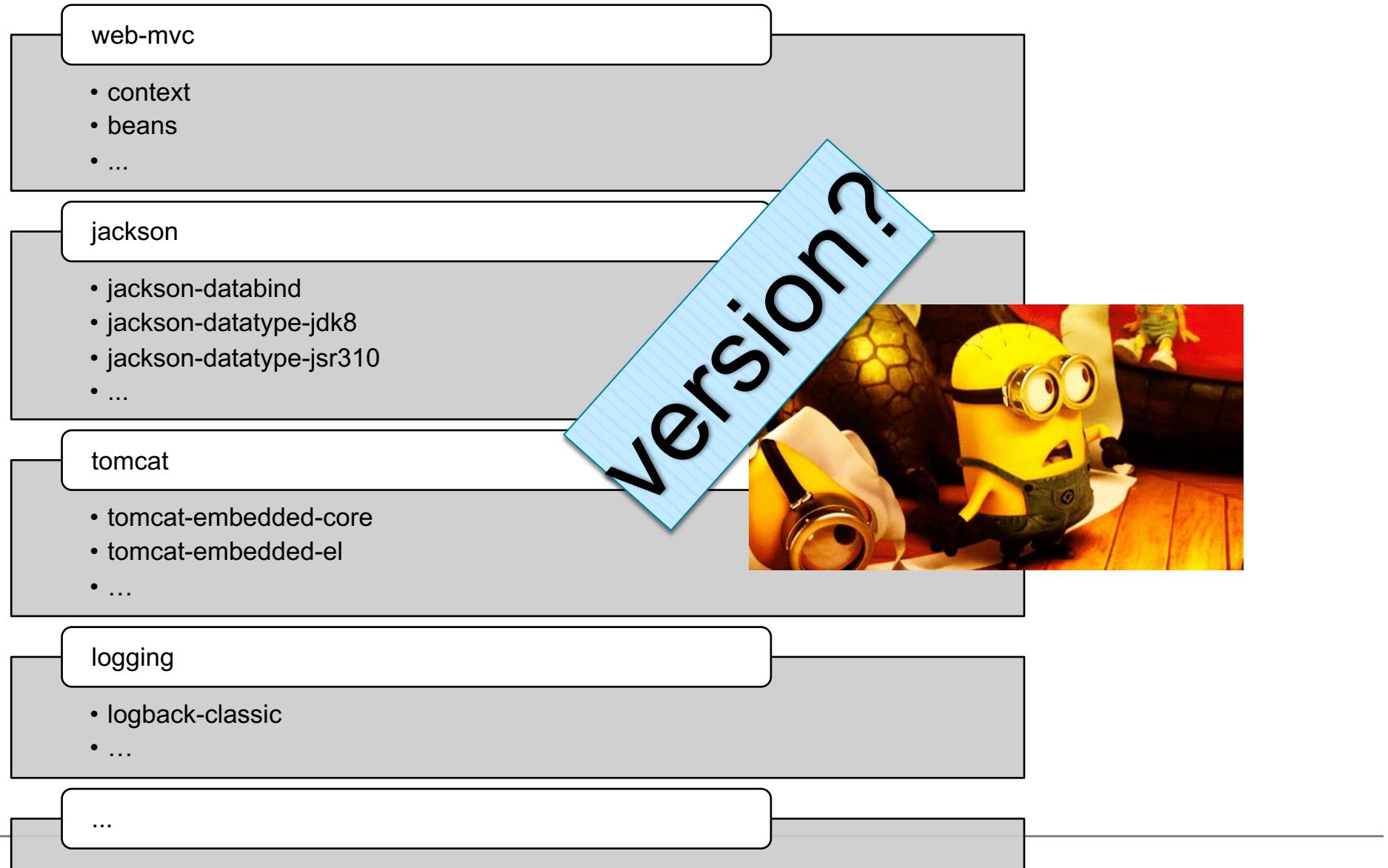
    @Bean
    public CommandLineRunner commandLineRunner(ApplicationContext ctx) {
        return args -> { inspectSpring(ctx); };
    }

    private void inspectSpring(ApplicationContext ctx) {
        System.out.println("Beans provided by Spring Boot:");
        String[] beanNames = ctx.getBeanDefinitionNames();
        Arrays.sort(beanNames);
        Arrays.stream(beanNames).forEach(System.out::println);
    }
}
```



Starters

Dependencies needed for a webapp





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

spring-boot-starter-web

```
\- org.springframework.boot:spring-boot-starter-web:jar:2.1.3.RELEASE:compile
  +- org.springframework.boot:spring-boot-starter:jar:2.1.3.RELEASE:compile
    +- org.springframework.boot:spring-boot:jar:2.1.3.RELEASE:compile
    +- org.springframework.boot:spring-boot-autoconfigure:jar:2.1.3.RELEASE:compile
    +- org.springframework.boot:spring-boot-starter-logging:jar:2.1.3.RELEASE:compile
      +- ch.qos.logback:logback-classic:jar:1.2.3:compile
        +- ch.qos.logback:logback-core:jar:1.2.3:compile
        \- org.slf4j:slf4j-api:jar:1.7.25:compile
      +- org.apache.logging.log4j:log4j-to-slf4j:jar:2.11.2:compile
        \- org.apache.logging.log4j:log4j-api:jar:2.11.2:compile
      \- org.slf4j:jul-to-slf4j:jar:1.7.25:compile
    +- javax.annotation:javax.annotation-api:jar:1.3.2:compile
    +- org.springframework:spring-core:jar:5.1.5.RELEASE:compile
      \- org.springframework:spring-jcl:jar:5.1.5.RELEASE:compile
    \- org.yaml:snakeyaml:jar:1.23:runtime
  +- org.springframework.boot:spring-boot-starter-json:jar:2.1.3.RELEASE:compile
    +- com.fasterxml.jackson.core:jackson-databind:jar:2.9.8:compile
      +- com.fasterxml.jackson.core:jackson-annotations:jar:2.9.0:compile
      \- com.fasterxml.jackson.core:jackson-core:jar:2.9.8:compile
    +- com.fasterxml.jackson.datatype:jackson-datatype-jdk8:jar:2.9.8:compile
    +- com.fasterxml.jackson.datatype:jackson-datatype-jsr310:jar:2.9.8:compile
    \- com.fasterxml.jackson.module:jackson-module-parameter-names:jar:2.9.8:compile
  +- org.springframework.boot:spring-boot-starter-tomcat:jar:2.1.3.RELEASE:compile
    +- org.apache.tomcat.embed:tomcat-embed-core:jar:9.0.16:compile
    +- org.apache.tomcat.embed:tomcat-embed-el:jar:9.0.16:compile
    \- org.apache.tomcat.embed:tomcat-embed-websocket:jar:9.0.16:compile
  +- org.hibernate.validator:hibernate-validator:jar:6.0.14.Final:compile
    +- javax.validation:validation-api:jar:2.0.1.Final:compile
    +- org.jboss.logging:jboss-logging:jar:3.3.2.Final:compile
    \- com.fasterxml:classmate:jar:1.4.0:compile
  +- org.springframework:spring-web:jar:5.1.5.RELEASE:compile
    \- org.springframework:spring-beans:jar:5.1.5.RELEASE:compile
  \- org.springframework:spring-webmvc:jar:5.1.5.RELEASE:compile
    +- org.springframework:spring-aop:jar:5.1.5.RELEASE:compile
    +- org.springframework:spring-context:jar:5.1.5.RELEASE:compile
    \- org.springframework:spring-expression:jar:5.1.5.RELEASE:compile
```





Starter Projects

[spring-boot](#) / [spring-boot-project](#) / [spring-boot-starters](#) /

[Create new file](#)

[Upload files](#)

[Find file](#)

[History](#)



spring-operator and wilkinsona Use HTTPS for external links in XML files [...](#)

Latest commit 00ab303 a day ago

..		
spring-boot-starter-activemq	Merge branch '2.1.x'	2 days ago
spring-boot-starter-actuator	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-amqp	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-aop	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-artemis	Merge branch '2.1.x'	2 days ago
spring-boot-starter-batch	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-cache	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-cloud-connectors	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-data-cassandra-re......	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-data-cassandra	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-data-couchbase-re......	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-data-couchbase	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-data-elasticsearch	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-data-jdbc	Update build and setup configuration to use HTTPS	2 days ago
spring-boot-starter-data-jpa	Merge branch '2.1.x'	2 days ago
spring-boot-starter-data-ldap	Merge branch '2.0.x' into 2.1.x	2 days ago
spring-boot-starter-data-mongodb-reac......	Merge branch '2.0.x' into 2.1.x	2 days ago



Automatic Restart

- any entry on the classpath
- NOT – static resources & templates

Default Configs

- Cache is disabled
- Log level DEBUG für “web”

LiveReload

- Triggers a browser refresh

Dev Tools



Service URL ▼

Frequently Used

Web Websocket

Available: Selected:

X

▼ Core

DevTools

X Web

```
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-devtools</artifactId>
    <scope>runtime</scope>
</dependency>
```



Exercises 16 – 19

https://github.com/Michaeli71/AMTC_Spring_Workshop





Persistenz und Spring Data



COMING
Soon



Questions?

Weitere Infos / Quellen



- **Spring Tutorials**

- https://www.tutorialspoint.com/spring_boot/index.htm
 - <https://www.javatpoint.com/spring-boot-tutorial>
-



Thank You