Spring 2.0 Kickstart

Thomas Risberg
Matt Raible

Spring Forward 2006

Introduction

Thomas Risberg

- Independent Consultant, springdeveloper.com
- Committer on the Spring Framework project since 2003
- Supporting the JDBC and Data Access code
- Co-author of "Professional Java Development with the Spring Framework" from Wrox

Sample Application

Disclaimer!

- This is currently using leading edge and un-released software, things might change slightly and some features might be temporarily broken on occasion.

How to build the code

Prerequisites: *Java SDK 5.0, Maven 2.0.4, Subversion*

1. Download source from project at Google Code:

   http://code.google.com/p/spring-kickstart/

   Check-out using Subversion:

   ```
   svn checkout http://spring-kickstart.googlecode.com/svn/trunk/ spring-kickstart
   ```

2. Switch to new project

   ```
   > cd spring-kickstart/kickstart
   ```

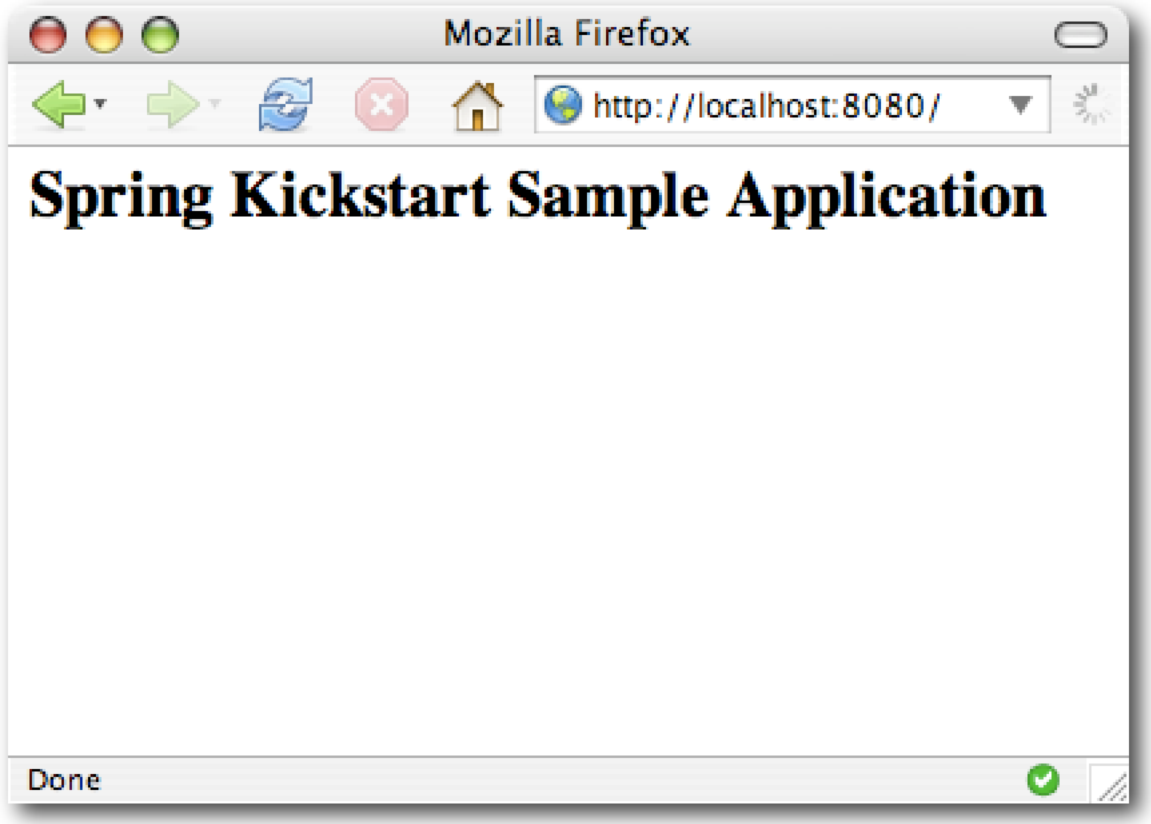
3. Run Maven build:

   ```
   > mvn clean package
   ```

How to run the code

4. Run Maven Jetty plug-in:

```
> mvn jetty:run
```



Spring Kickstart Sample Application

Spring 2.0 Kickstart

Introduction

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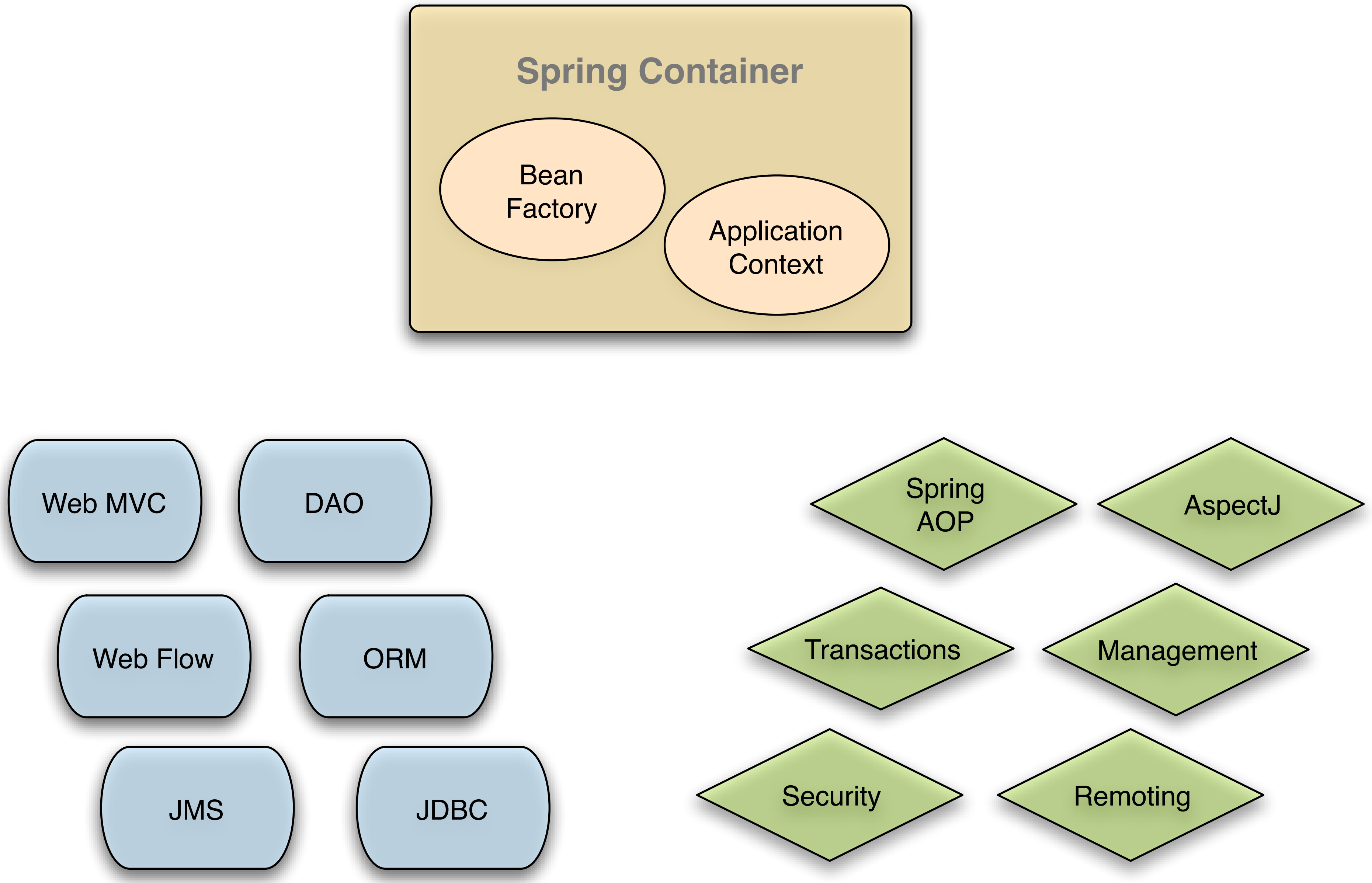
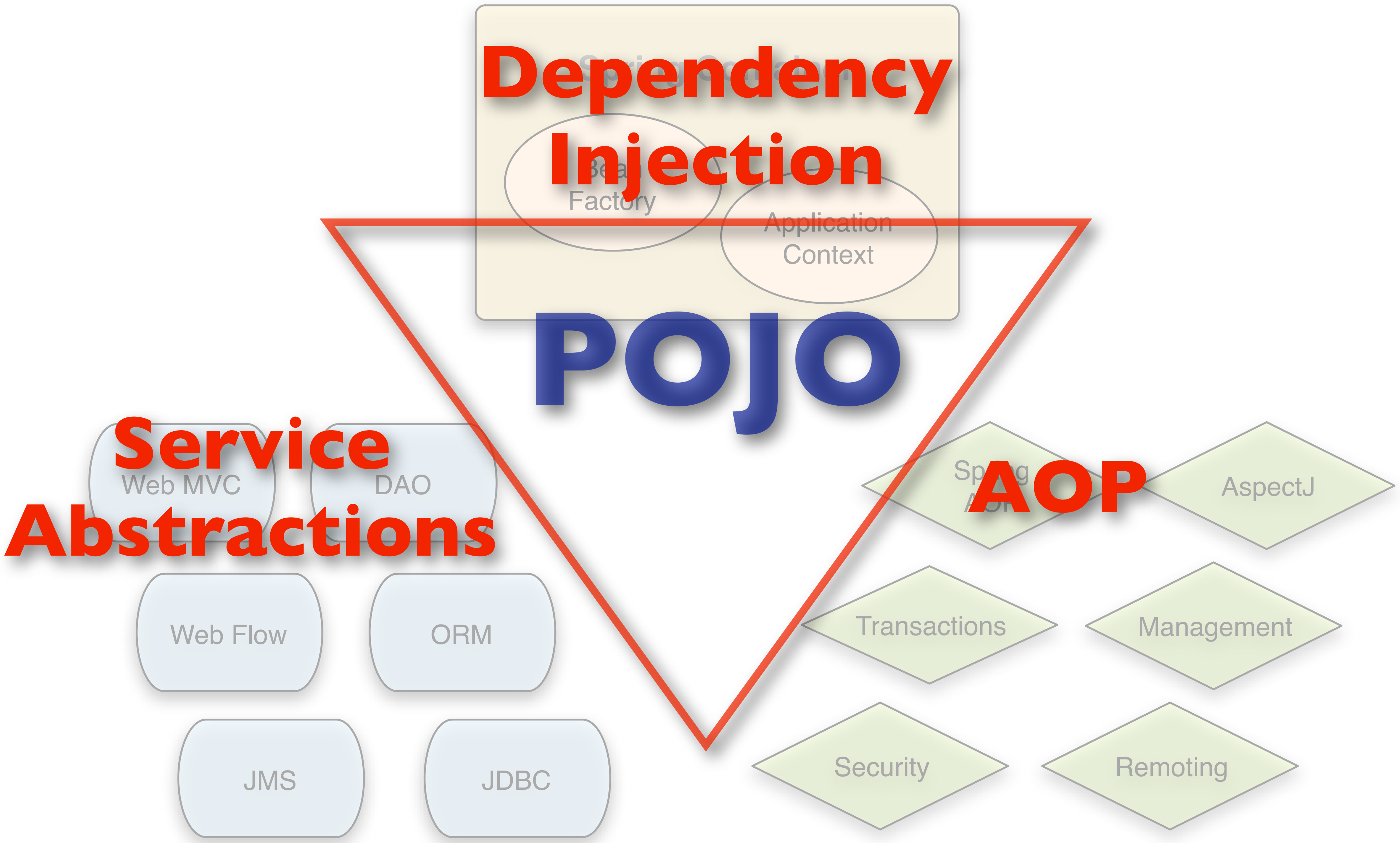
Intro

- Spring is a Lightweight Application Framework covering all tiers of your typical business application
- Leverages services from underlying runtime environment (e.g. Java EE Services)
- Provides AOP services for security, transactions, management and remoting
- Integrates with other commonly used frameworks and libraries
- Greatly simplifies development effort
- Promotes modular, reusable coding practices

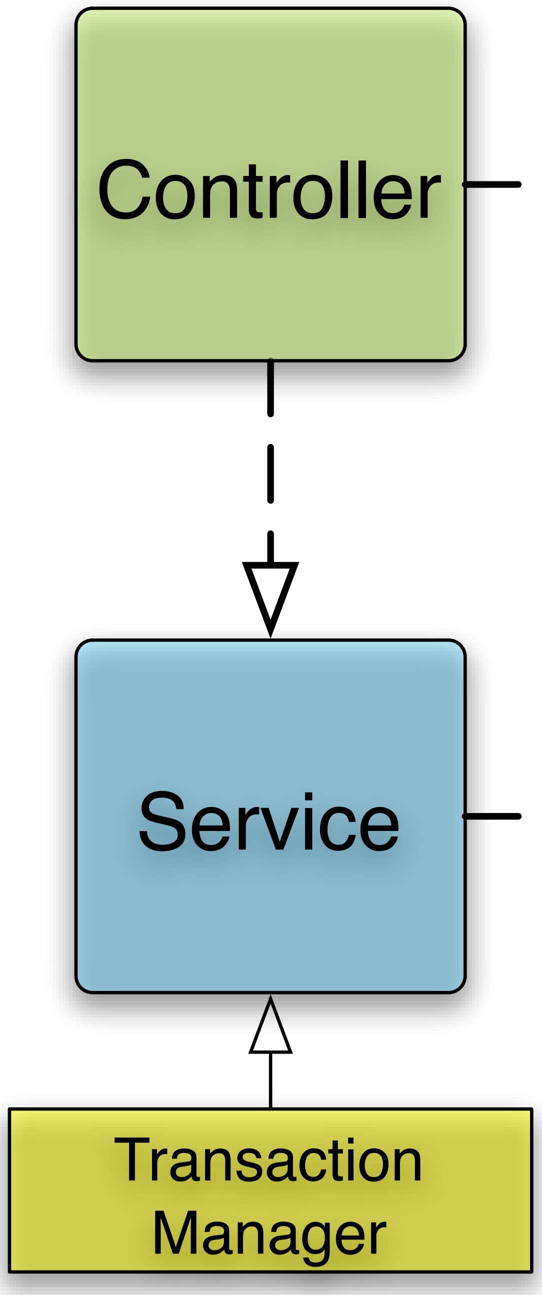
Spring Triangle



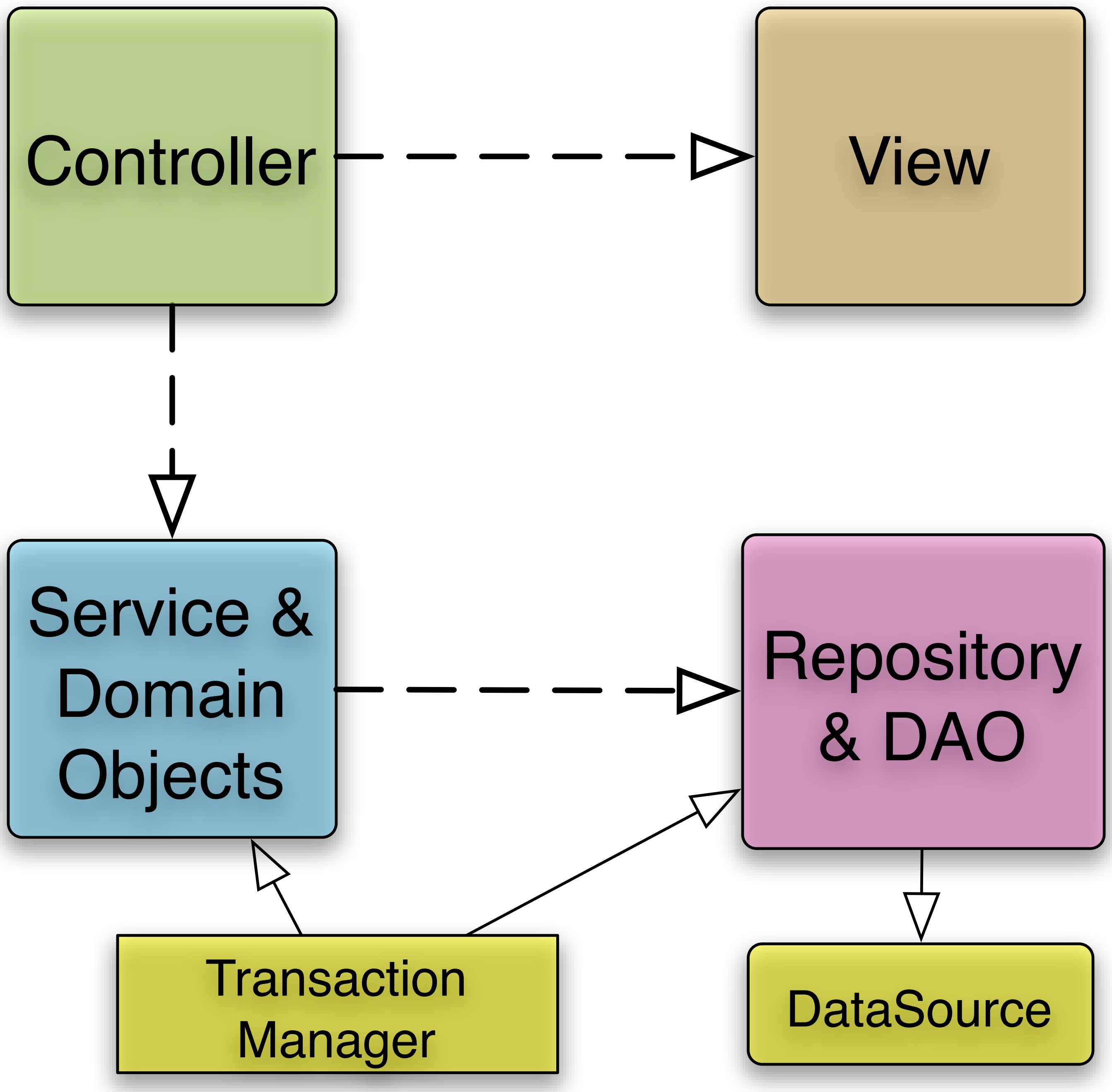
Spring Triangle



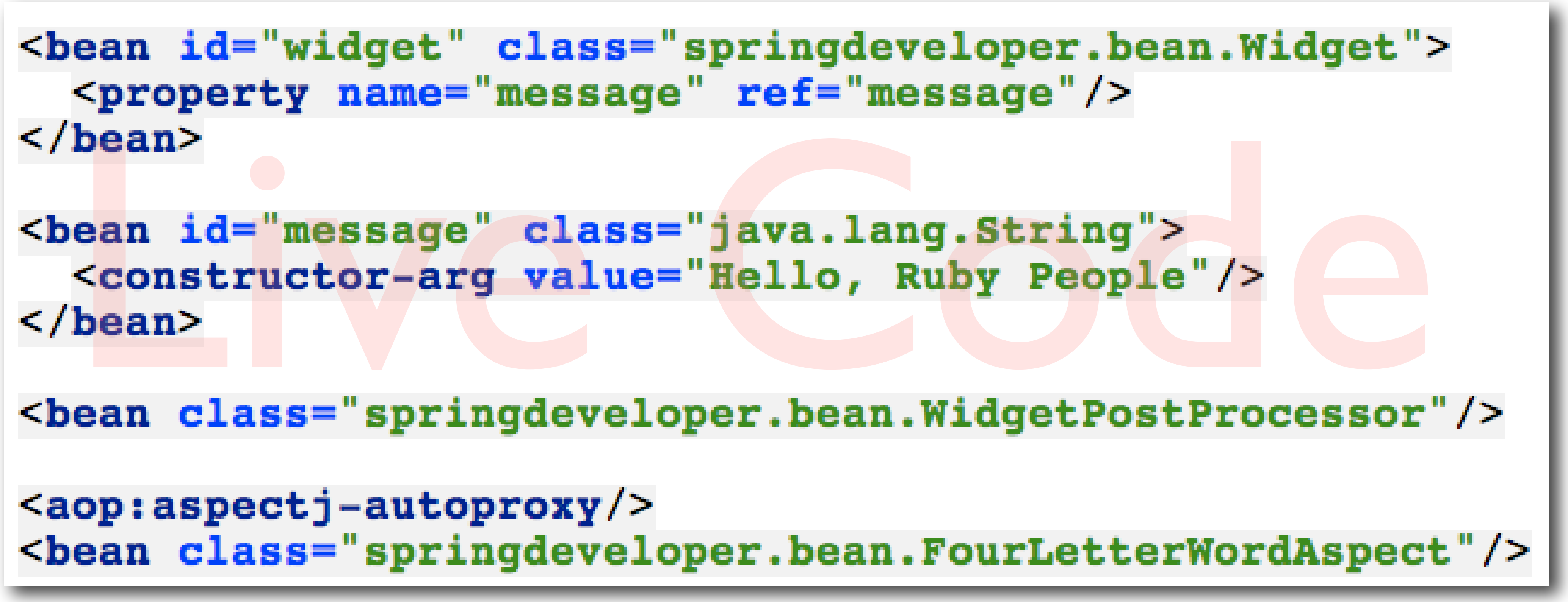
Typical Spring Web App



DDD Spring Web App



Application Context Basics



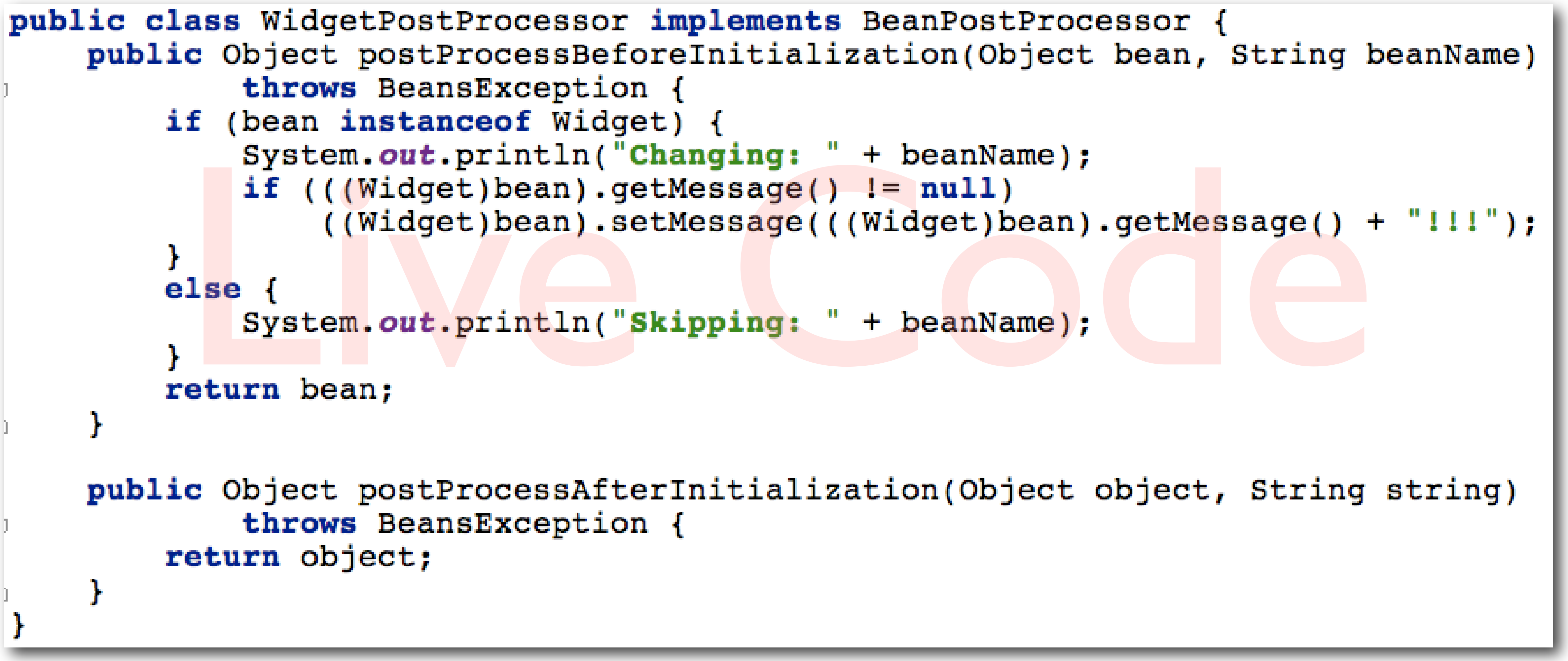
```
<bean id="widget" class="springdeveloper.bean.Widget">
  <property name="message" ref="message"/>
</bean>

<bean id="message" class="java.lang.String">
  <constructor-arg value="Hello, Ruby People"/>
</bean>

<bean class="springdeveloper.bean.WidgetPostProcessor"/>

<aop:aspectj-autoproxy/>
<bean class="springdeveloper.bean.FourLetterWordAspect"/>
```

Application Context Basics



```java
public class WidgetPostProcessor implements BeanPostProcessor {
    public Object postProcessBeforeInitialization(Object bean, String beanName)
            throws BeansException {
        if (bean instanceof Widget) {
            System.out.println("Changing: " + beanName);
            if (((Widget)bean).getMessage() != null)
                ((Widget)bean).setMessage(((Widget)bean).getMessage() + "!!!");
        }
        else {
            System.out.println("Skipping: " + beanName);
        }
        return bean;
    }

    public Object postProcessAfterInitialization(Object object, String string)
            throws BeansException {
        return object;
    }
}
```

Spring 2.0 Kickstart

Persistence

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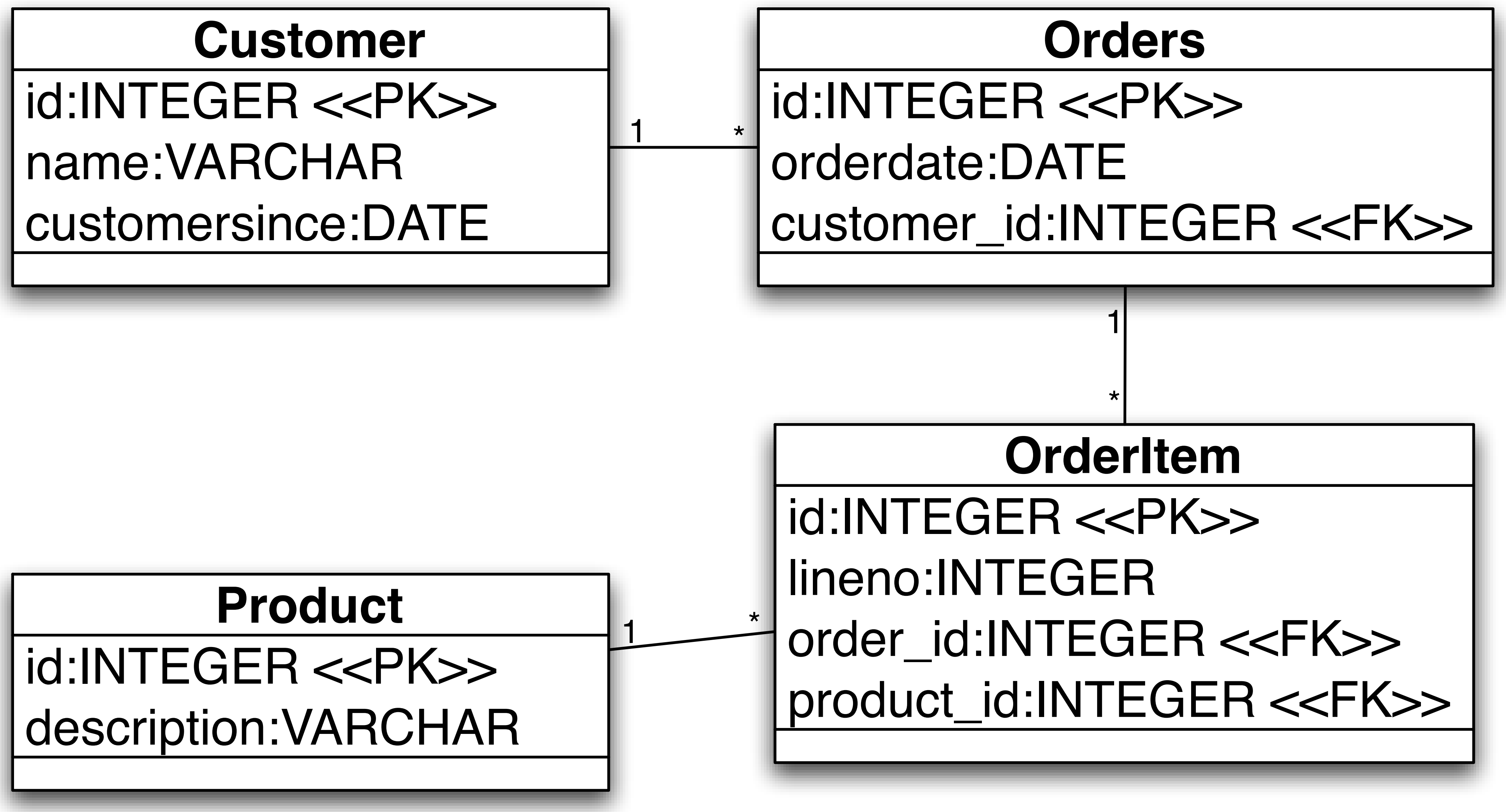
Sample Application

Customer Service Application

- Show a list of customers and choose one for further functionality
- Modify a customer entry
- List all orders for a customer
- Cancel an order that hasn't shipped

Data Model


Customer
id:INTEGER <<PK>>
name:VARCHAR
customersince:DATE
Orders
id:INTEGER <<PK>>
orderdate:DATE
customer_id:INTEGER <<FK>>
OrderItem
id:INTEGER <<PK>>
lineno:INTEGER
order_id:INTEGER <<FK>>
product_id:INTEGER <<FK>>
Product
id:INTEGER <<PK>>
description:VARCHAR
1
*
1
*
1
*

Start new Maven Project

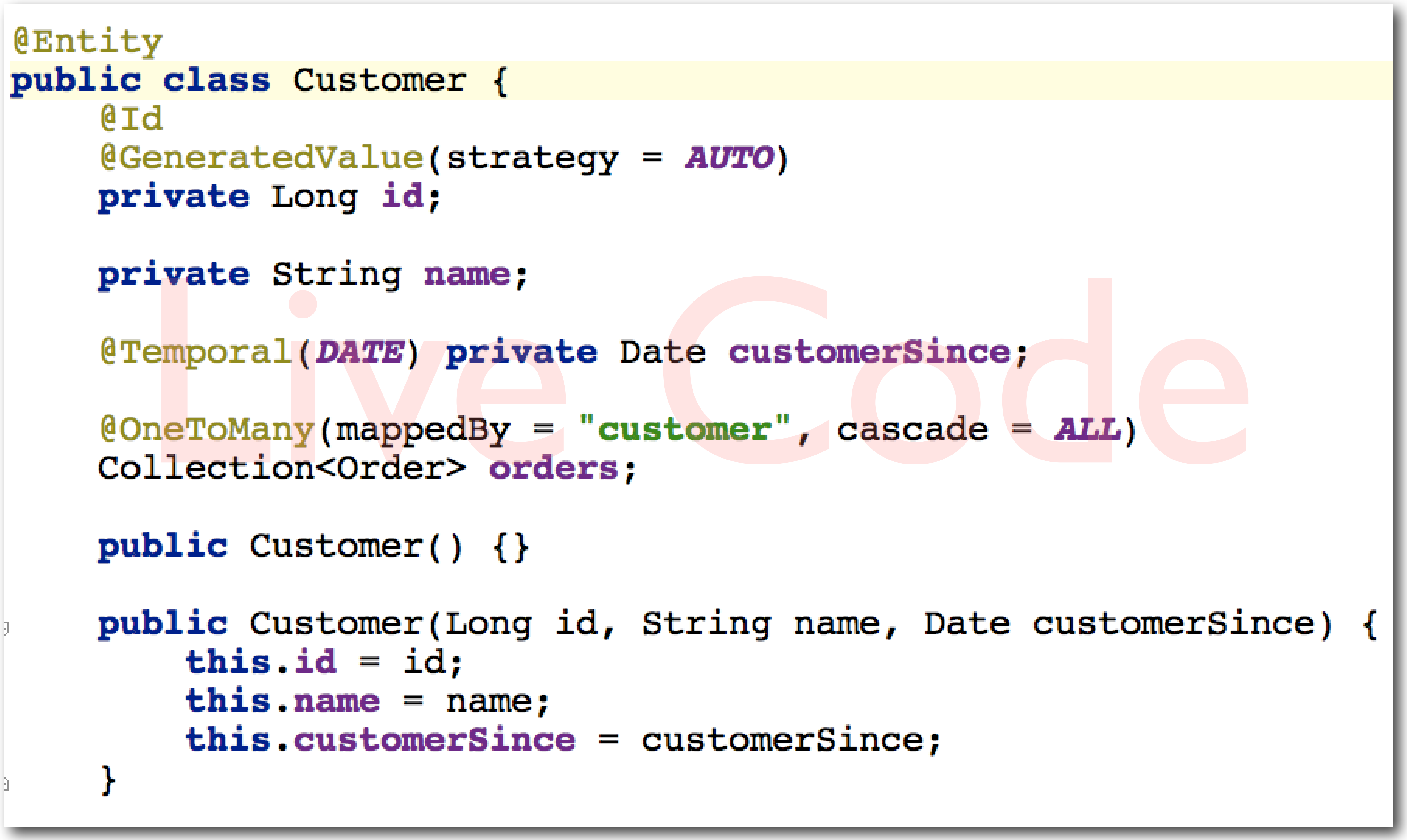
```
mvn archetype:create -DgroupId=spring.kickstart \
  -DartifactId=kickstart \
  -DarchetypeArtifactId=maven-archetype-webapp
```

Maven pom.xml configuration

```
<build>
  <finalName>kickstart</finalName>
  <plugins>
    <plugin>
      <groupId>org.apache.maven.plugins</groupId>
      <artifactId>maven-compiler-plugin</artifactId>
      <configuration>
        <source>1.5</source>
        <target>1.5</target>
      </configuration>
    </plugin>
    <plugin>
      <groupId>org.mortbay.jetty</groupId>
      <artifactId>maven-jetty-plugin</artifactId>
      <configuration>
        <scanIntervalSeconds>3</scanIntervalSeconds>
        <contextPath>/</contextPath>
        <scanTargets>
          <scanTarget>src/main/webapp/WEB-INF/kickstart-servlet.xml</scanTarget>
          <scanTarget>src/main/resources/messages.properties</scanTarget>
        </scanTargets>
      </configuration>
    </plugin>
  </plugins>
</build>
```

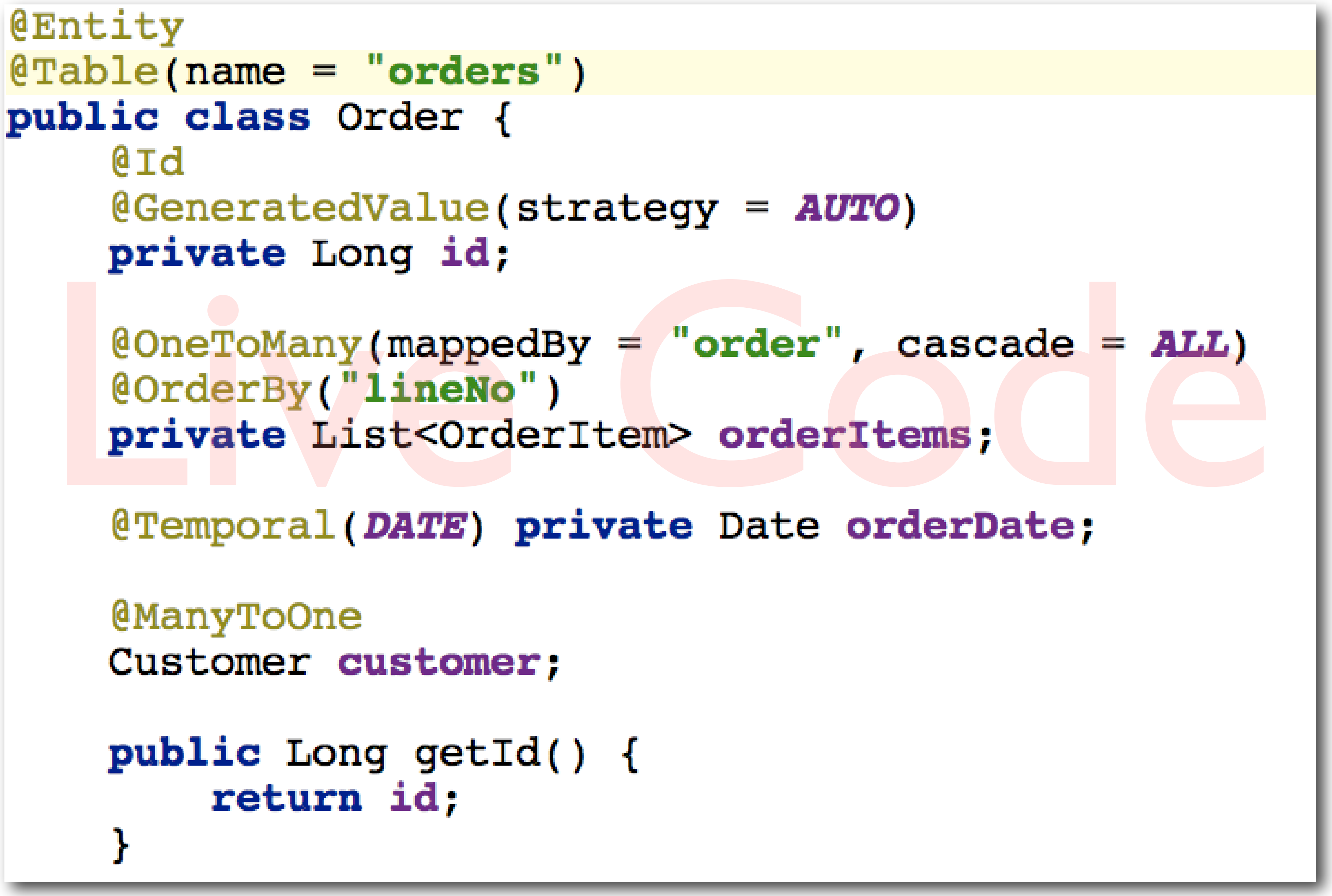
```
<!-- persistence dependencies -->
<dependency>
  <groupId>org.springframework</groupId>
  <artifactId>spring</artifactId>
  <version>2.0-rc4</version>
</dependency>
<dependency>
  <groupId>org.springframework</groupId>
  <artifactId>spring-mock</artifactId>
  <version>2.0-rc4</version>
</dependency>
<dependency>
  <groupId>org.springframework</groupId>
  <artifactId>spring-jpa</artifactId>
  <version>2.0-rc4</version>
</dependency>
<dependency>
  <groupId>javax.persistence</groupId>
  <artifactId>persistence-api</artifactId>
  <version>1.0</version>
</dependency>
<dependency>
  <groupId>javax.persistence</groupId>
  <artifactId>toplink-essentials</artifactId>
  <version>1.0</version>
</dependency>
<dependency>
  <groupId>hsqldb</groupId>
  <artifactId>hsqldb</artifactId>
  <version>1.8.0.5</version>
</dependency>
<dependency>
  <groupId>c3p0</groupId>
  <artifactId>c3p0</artifactId>
  <version>0.9.0.4</version>
</dependency>
```

Customer Class



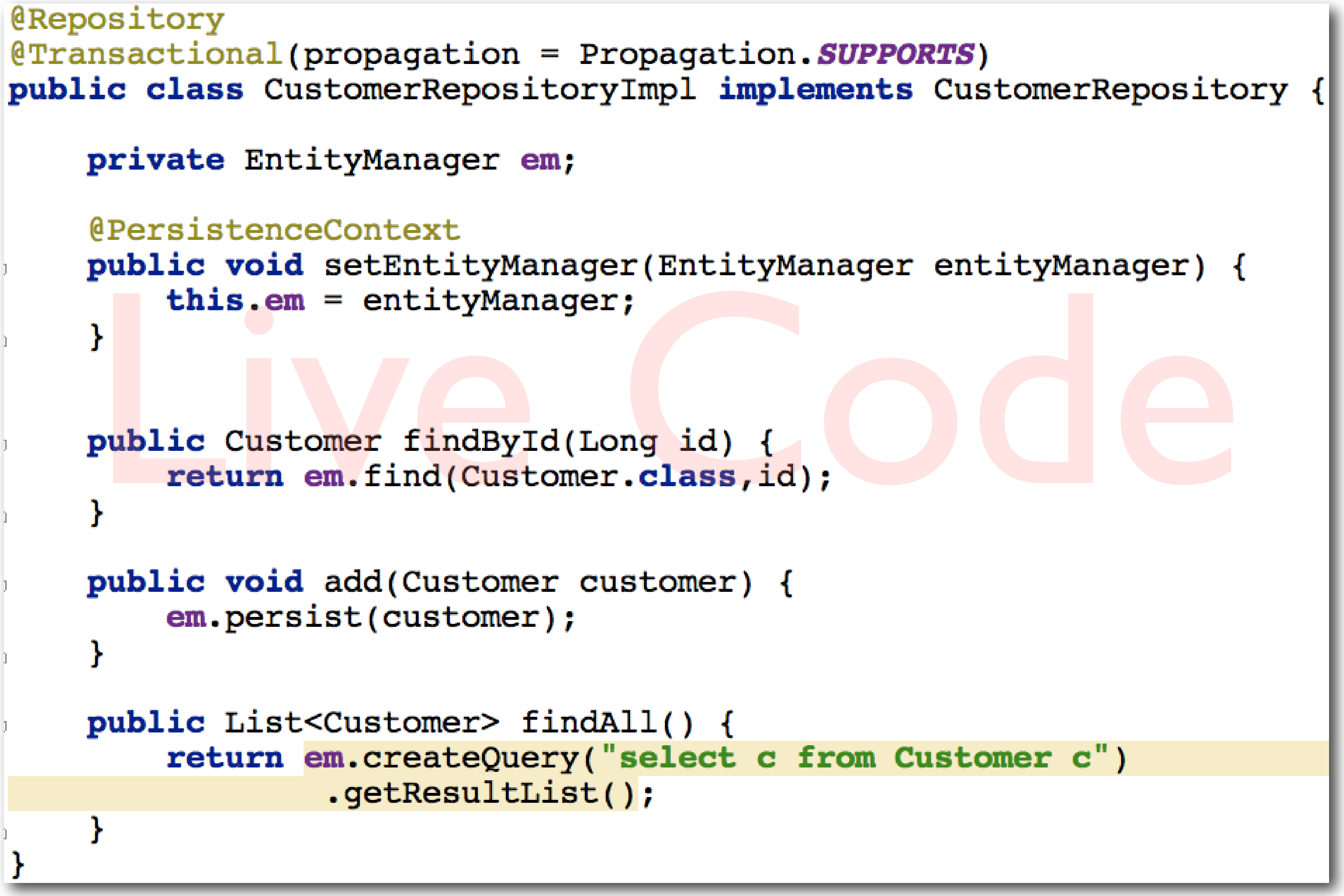
```java
@Entity
public class Customer {
    @Id
    @GeneratedValue(strategy = AUTO)
    private Long id;

    private String name;

    @Temporal(DATE) private Date customerSince;

    @OneToMany(mappedBy = "customer", cascade = ALL)
    Collection<Order> orders;

    public Customer() {}

    public Customer(Long id, String name, Date customerSince) {
        this.id = id;
        this.name = name;
        this.customerSince = customerSince;
    }
```

Order Class



```
@Entity
@Table(name = "orders")
public class Order {
    @Id
    @GeneratedValue(strategy = AUTO)
    private Long id;

    @OneToMany(mappedBy = "order", cascade = ALL)
    @OrderBy("lineNo")
    private List<OrderItem> orderItems;

    @Temporal(DATE) private Date orderDate;

    @ManyToOne
    Customer customer;

    public Long getId() {
        return id;
    }
```

Customer Repository



```java
@Repository
@Transactional(propagation = Propagation.SUPPORTS)
public class CustomerRepositoryImpl implements CustomerRepository {

    private EntityManager em;

    @PersistenceContext
    public void setEntityManager(EntityManager entityManager) {
        this.em = entityManager;
    }


    public Customer findById(Long id) {
        return em.find(Customer.class,id);
    }

    public void add(Customer customer) {
        em.persist(customer);
    }

    public List<Customer> findAll() {
        return em.createQuery("select c from Customer c")
                  .getResultList();
    }
}
```

Spring Configuration

- **`@Repository`**
  - `PersistenceExceptionTranslationPostProcessor`
- **`@Transactional`**
  - `<tx:annotation-driven/>`
  - `JpaTransactionManager`
- **`@PersistenceContext`**
  - `LocalContainerEntityManagerFactoryBean`
  - `PersistenceAnnotationBeanPostProcessor`

repository-config.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xmlns:tx="http://www.springframework.org/schema/tx"
   xsi:schemaLocation="http://www.springframework.org/schema/beans
     http://www.springframework.org/schema/beans/spring-beans-2.0.xsd
     http://www.springframework.org/schema/tx
     http://www.springframework.org/schema/tx/spring-tx-2.0.xsd">

   <bean id="customerRepository" class="spring.kickstart.repository.CustomerRepositoryImpl"/>

   <bean id="productRepository" class="spring.kickstart.repository.ProductRepositoryImpl"/>

   <bean class="org.springframework.dao.annotation.PersistenceExceptionTranslationPostProcessor"/>

   <bean class="org.springframework.orm.jpa.support.PersistenceAnnotationBeanPostProcessor"/>

   <bean id="transactionManager" class="org.springframework.orm.jpa.JpaTransactionManager">
      <property name="entityManagerFactory"
         ref="entityManagerFactory" />
   </bean>

   <tx:annotation-driven />
. . .
```

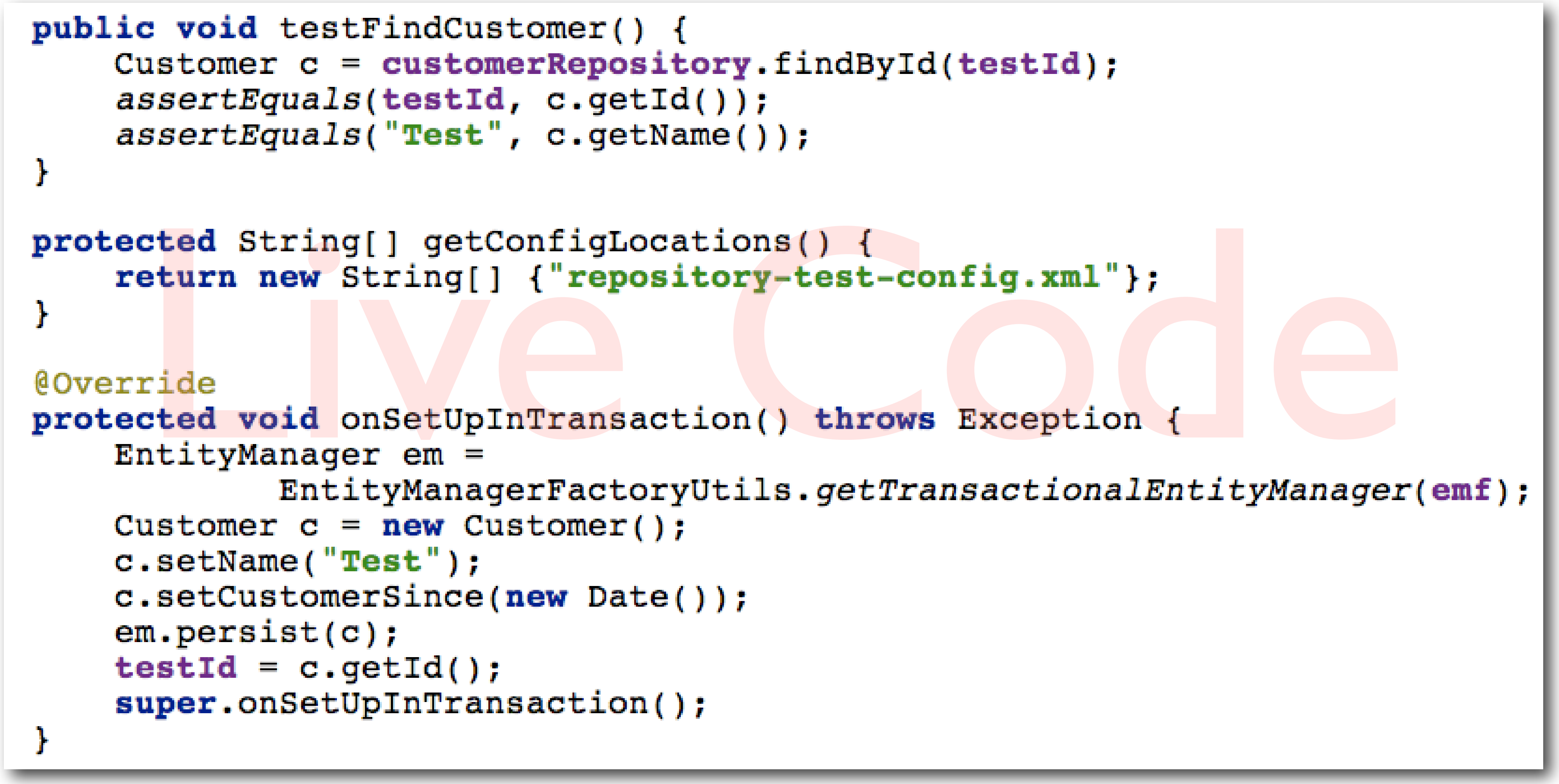
repository-config.xml

```
. . .
<bean id="entityManagerFactory"
         class="org.springframework.orm.jpa.LocalContainerEntityManagerFactoryBean">
       <property name="dataSource" ref="dataSource"/>
       <property name="persistenceUnitName" value="kickstart"/>
       <property name="jpaVendorAdapter">
         <bean class="org.springframework.orm.jpa.vendor.TopLinkJpaVendorAdapter">
            <property name="showSql" value="false"/>
            <property name="generateDdl" value="false"/>
            <property name="databasePlatform" value="Derby"/>
         </bean>
       </property>
       <property name="loadTimeWeaver">
           <bean class="org.springframework.instrument.classloading.SimpleLoadTimeWeaver"/>
        </property>
   </bean>
. . .
```

repository-config.xml

```
. . .
  <bean id="dataSource" class="com.mchange.v2.c3p0.ComboPooledDataSource"
        destroy-method="close">
      <property name="driverClass" value="${db.driverClassName}"/>
      <property name="jdbcUrl" value="${db.url}"/>
      <property name="user" value="${db.userName}"/>
      <property name="password" value="${db.password}"/>
      <property name="minPoolSize" value="2"/>
      <property name="maxPoolSize" value="15"/>
      <property name="maxStatements" value="50"/>
  </bean>

  <bean id="propertyConfigurer"
        class="org.springframework.beans.factory.config.PropertyPlaceholderConfigurer">
      <property name="locations">
          <list>
              <value>jdbc.properties</value>
          </list>
      </property>
  </bean>

</beans>
```

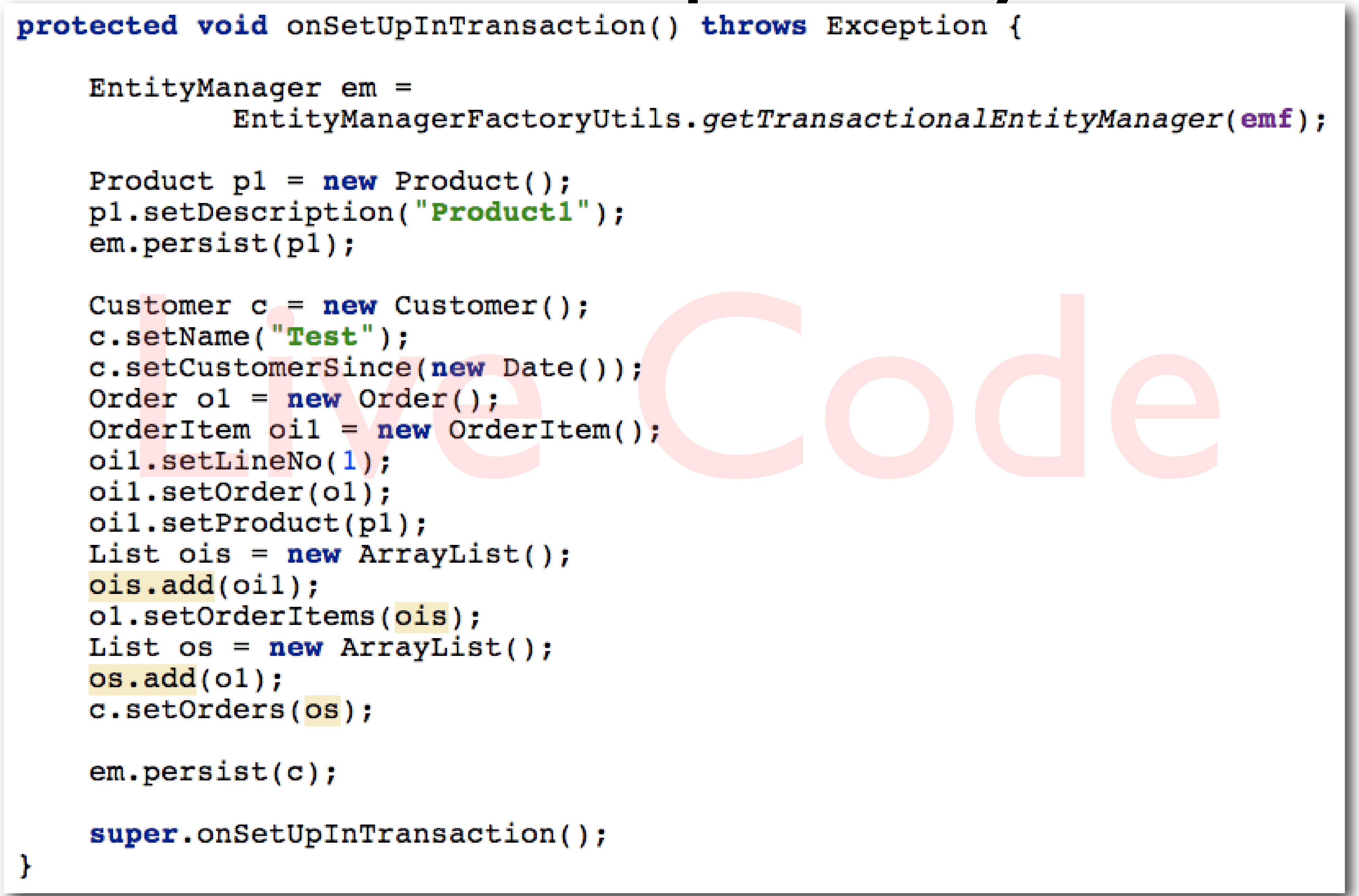
CustomerRepositoryTest



```java
public void testFindCustomer() {
    Customer c = customerRepository.findById(testId);
    assertEquals(testId, c.getId());
    assertEquals("Test", c.getName());
}

protected String[] getConfigLocations() {
    return new String[] {"repository-test-config.xml"};
}

@Override
protected void onSetUpInTransaction() throws Exception {
    EntityManager em =
            EntityManagerFactoryUtils.getTransactionalEntityManager(emf);
    Customer c = new Customer();
    c.setName("Test");
    c.setCustomerSince(new Date());
    em.persist(c);
    testId = c.getId();
    super.onSetUpInTransaction();
}
```

Live Code

CustomerRepositoryTest



```
protected void onSetUpInTransaction() throws Exception {

    EntityManager em =
            EntityManagerFactoryUtils.getTransactionalEntityManager(emf);

    Product p1 = new Product();
    p1.setDescription("Product1");
    em.persist(p1);

    Customer c = new Customer();
    c.setName("Test");
    c.setCustomerSince(new Date());
    Order o1 = new Order();
    OrderItem oi1 = new OrderItem();
    oi1.setLineNo(1);
    oi1.setOrder(o1);
    oi1.setProduct(p1);
    List ois = new ArrayList();
    ois.add(oi1);
    o1.setOrderItems(ois);
    List os = new ArrayList();
    os.add(o1);
    c.setOrders(os);

    em.persist(c);

    super.onSetUpInTransaction();
}
```

Live Code

Q & A

Persistence

Don't miss JPA talks this afternoon!