Curso Java COMPLETO

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Projeto web services com Spring Boot e JPA / Hibernate

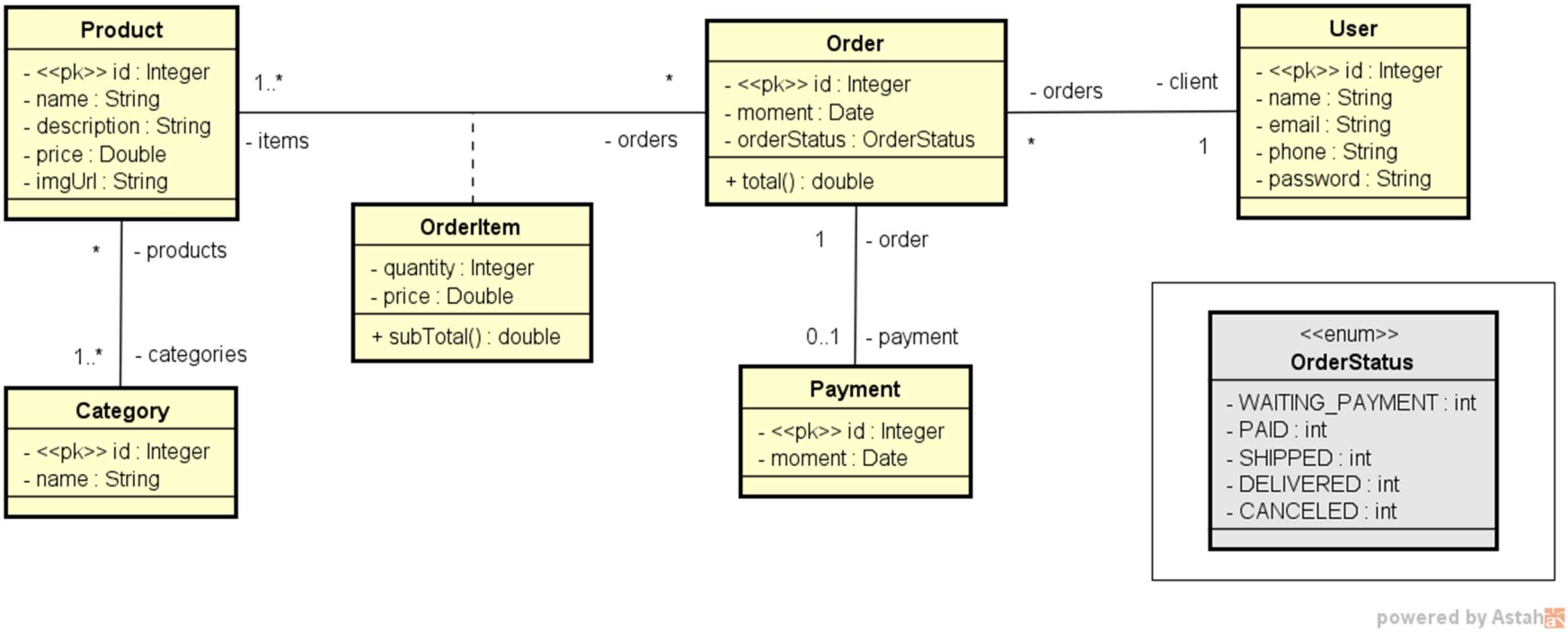
Objetivos

- Criar projeto Spring Boot Java
- Implementar modelo de domínio
- Estruturar camadas lógicas: resource, service, repository
- Configurar banco de dados de teste (H2)
- Povoar o banco de dados
- CRUD - Create, Retrieve, Update, Delete
- Tratamento de exceções

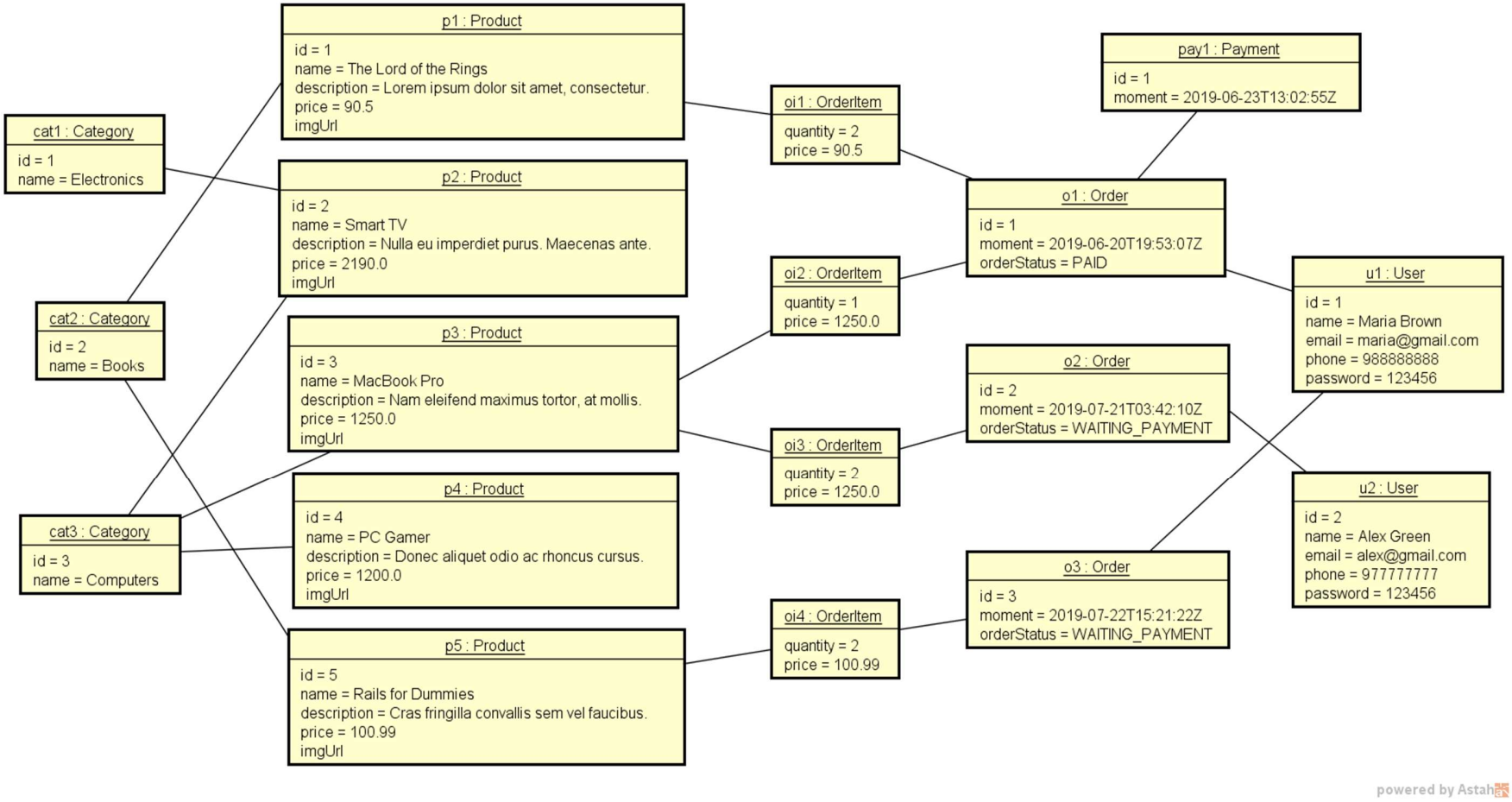
Github:

https://github.com/acenelio/workshop-springboot2-jpa
https://github.com/acenelio/workshop-springboot3-jpa

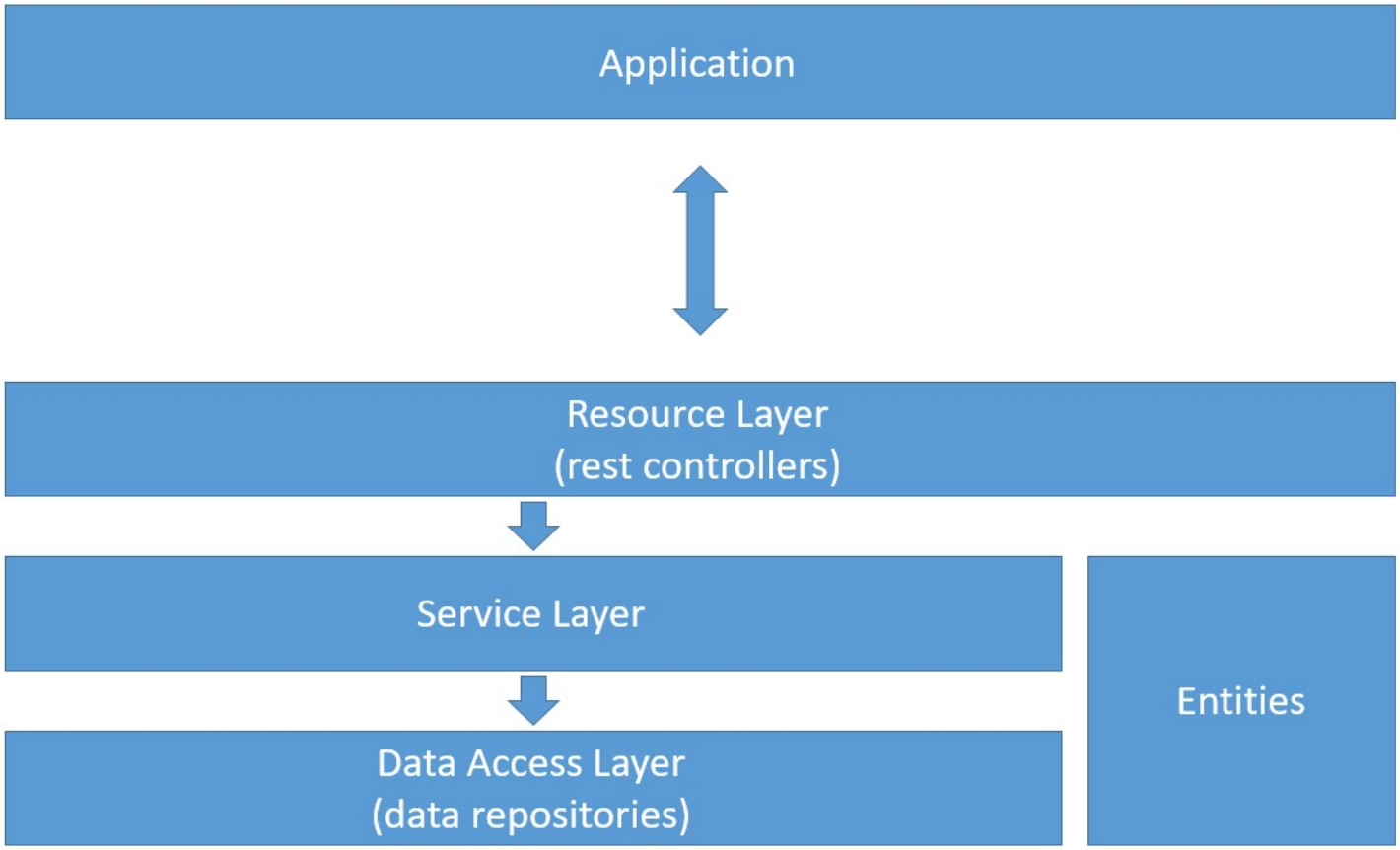
Domain Model



Domain Instance



Logical Layers



CHECLIST DO PROJETO

Project created Criação do projeto

Checklist:

- Spring Initializr
  - Maven
  - Java 17
  - Packing JAR
  - Dependencies: Spring Web

User entity and resource Criação da entidade (da classe)

Basic entity checklist:

- Basic attributes
- Associations (instantiate collections)
- Constructors
- Getters & Setters (collections: only get)
- hashCode & equals
- Serializable

H2 database, test profile, JPA

Checklist:

- JPA & H2 dependencies Colar as dependencias no arquivo pom.xml
- application.properties
- application-test.properties
- Entity: JPA mapping

Dependencies:

```
<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>
```

application.properties:

```
spring.profiles.active=test

spring.jpa.open-in-view=true
```

application-test.properties:

```
# DATASOURCE
spring.datasource.driverClassName=org.h2.Driver
spring.datasource.url=jdbc:h2:mem:testdb
spring.datasource.username=sa
spring.datasource.password=

# H2 CLIENT
spring.h2.console.enabled=true
spring.h2.console.path=/h2-console

# JPA, SQL
spring.jpa.database-platform=org.hibernate.dialect.H2Dialect
spring.jpa.defer-datasource-initialization=true
spring.jpa.show-sql=true
spring.jpa.properties.hibernate.format_sql=true
```

JPA repository, dependency injection, database seeding

Instanciação do banco de dados

Checklist:

- UserRepository extends JPARepository<User, Long>
- Configuration class for "test" profile
- @Autowired UserRepository
- Instantiate objects in memory
- Persist objects

Objects:

```
User u1 = new User(null, "Maria Brown", "maria@gmail.com", "988888888", "123456");
User u2 = new User(null, "Alex Green", "alex@gmail.com", "977777777", "123456");
```

Service layer, component registration

Order, Instant, ISO 8601

Basic new entity checklist:

- Entity
  - "To many" association, lazy loading, JsonIgnore
- Repository
- Seed
- Service
- Resource

Objects:

```
Order o1 = new Order(null, Instant.parse("2019-06-20T19:53:07Z"), u1);
Order o2 = new Order(null, Instant.parse("2019-07-21T03:42:10Z"), u2);
Order o3 = new Order(null, Instant.parse("2019-07-22T15:21:22Z"), u1);
```

OrderStatus enum

Category

Objects:

```
Category cat1 = new Category(null, "Electronics");
Category cat2 = new Category(null, "Books");
Category cat3 = new Category(null, "Computers");
```

Product

Objects:

```
Product p1 = new Product(null, "The Lord of the Rings", "Lorem ipsum dolor sit amet, consectetur.", 90.5, "");
Product p2 = new Product(null, "Smart TV", "Nulla eu imperdiet purus. Maecenas ante.", 2190.0, "");
Product p3 = new Product(null, "Macbook Pro", "Nam eleifend maximus tortor, at mollis.", 1250.0, "");
Product p4 = new Product(null, "PC Gamer", "Donec aliquet odio ac rhoncus cursus.", 1200.0, "");
Product p5 = new Product(null, "Rails for Dummies", "Cras fringilla convallis sem vel faucibus.", 100.99, "");
```

Many-to-many association with JoinTable

OrderItem, many-to-many association with extra attributes

Checklist:

- OrderItemPK
- OrderItem
- Order one-to-many association
- Seed

Objects:

```
OrderItem oi1 = new OrderItem(o1, p1, 2, p1.getPrice());
OrderItem oi2 = new OrderItem(o1, p3, 1, p3.getPrice());
OrderItem oi3 = new OrderItem(o2, p3, 2, p3.getPrice());
OrderItem oi4 = new OrderItem(o3, p5, 2, p5.getPrice());
```

Product-OrderItem one-to-many association

Payment, one-to-one association

Subtotal & Total methods

User insert

Checklist:

- UserService
- UserResource

Test:

```
{
    "name": "Bob Brown",
    "email": "bob@gmail.com",
    "phone": "977557755",
    "password": "123456"
}
```

User delete

Checklist:

- UserService
- UserResource

User update

Checklist:

- UserService
- UserResource

Test:

```
{
    "name": "Bob Brown",
    "email": "bob@gmail.com",
    "phone": "977557755"
}
```

Exception handling - findById

Checklist:

- NEW CLASS: services.exceptions.ResourceNotFoundException
- NEW CLASS: resources.exceptions.StandardError
- NEW CLASS: resources.exceptions.ResourceExceptionHandler
- UserService

Exception handling - delete

Checklist:

- NEW CLASS: services.exceptions.DatabaseException
- ResourceExceptionHandler
- UserService
    - EmptyResultDataAccessException
    - DataIntegrityViolationException

Exception handling - update

Checklist:

- UserService
    - EntityNotFoundException

Deploy Heroku

ATENÇÃO: OPCIONAL / PAGO (CARTÃO DE CRÉDITO)

Create Heroku app & provision PostgreSQL

Checklist:

- Heroku Sign Up
- Create app
- Provision PostgreSQL
    - App dashboard -> Resources
    - Search "postgres" -> select "Heroku Postgres"

Install local PostgreSQL

Checklist:

- Download and install: https://www.postgresql.org/download/
    - Super user: postgres
    - Password: 1234567
    - Port: 5432
- Start/stop service: Task manager -> Services
- Check instalation
    - Start pgAdmin
    - Databases -> Create -> Database
        - Encoding: UTF8

Dev profile

Checklist:

- PgAdmin: create local database: `create database springboot_course`

- Add PostgreSQL Maven dependency

```
<dependency>
	<groupId>org.postgresql</groupId>
	<artifactId>postgresql</artifactId>
	<scope>runtime</scope>
</dependency>
```

- Create file: application-dev.properties

```
spring.datasource.url=jdbc:postgresql://localhost:5432/springboot_course
spring.datasource.username=postgres
spring.datasource.password=1234567

spring.jpa.properties.hibernate.jdbc.lob.non_contextual_creation=true
spring.jpa.hibernate.ddl-auto=update
spring.jpa.show-sql=true
spring.jpa.properties.hibernate.format_sql=true

jwt.secret=MYJWTSECRET
jwt.expiration=3600000
```

- Update application.properties: `spring.profiles.active=dev`

- Run application

Get SQL script from local PostgreSQL

- PgAdmin: get SQL script:
    - Select database
    - Tools -> Backup
        - Format: Plain
        - Encoding: UTF8
        - Dump options:
            - Only schema: YES
            - Blobs: NO
            - Do not save: (ALL)
            - Verbose messages: NO

- Delete instructions before CREATE statements

Run SQL Script

Checklist:

- App dashboard -> Settings - > Config Vars

    EXAMPLE:

    postgres://wavglvupbdad:358f443aafe452eca4c58fbc15d02e50b08130c7aaea3aff6c4f59c13f9abb@ec2-23-21-106-266.compute-1.amazonaws.com:5432/d7u9ub86cdsu

    user: wavglvupbdad

    password: 358f443aafe452eca4c58fbc15d02e50b08130c7aaea3aff6c4f59c13f9abb

    server: ec2-23-21-106-266.compute-1.amazonaws.com

port: 5432

database: d7u9ub86cdsu

- PgAdmin: Servers -> Create -> Server
  - Advanced -> DB rescriction: (database)

- Database -> Query Tool
  - Load and run SQL Script

Heroku CLI

Google: Heroku CLI

Terminal

```
heroku login

winpty heroku.cmd login
```

Deploy app to Heroku

- Heroku app dashboard -> Deploy

```
heroku git:remote -a myapp
git remote -v
```

- Setup Heroku app Config Vars
  - DATABASE_URL
  - JWT_EXPIRATION
  - JWT_SECRET

- Create: application-prod.properties

```
spring.datasource.url=${DATABASE_URL}

spring.jpa.hibernate.ddl-auto=none
spring.jpa.show-sql=false
spring.jpa.properties.hibernate.format_sql=false

jwt.secret=${JWT_SECRET}
jwt.expiration=${JWT_EXPIRATION}
```

- Update application.properties: `spring.profiles.active=prod`

- Create files: system.properties

```
java.runtime.version=17
```

- Send to Heroku:

```
git add .
git commit -m "Deploy app to Heroku"
git push heroku main
```