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TP 1-2
Java Persistence Api (JPA) with Spring Data

Introduction :

JPA is the standard Object Relational Mapping (ORM https://en.wikipedia.org/wiki/Object-relational_mapping) API. JPA is an abstraction of almost all the SQL server (Oracle, MySQL…).
Spring Data provide a familiar and consistent, Spring-based programming model for data access for relational and non-relational databases, map-reduce frameworks, and cloud-based data services : https://spring.io/projects/spring-data

Lab work objectives :

Form basic technical skills to work with database using data layer abstraction, represented as a collection of entities, relationships and repositories, implemented in terms of Java Spring Data.

Required material :

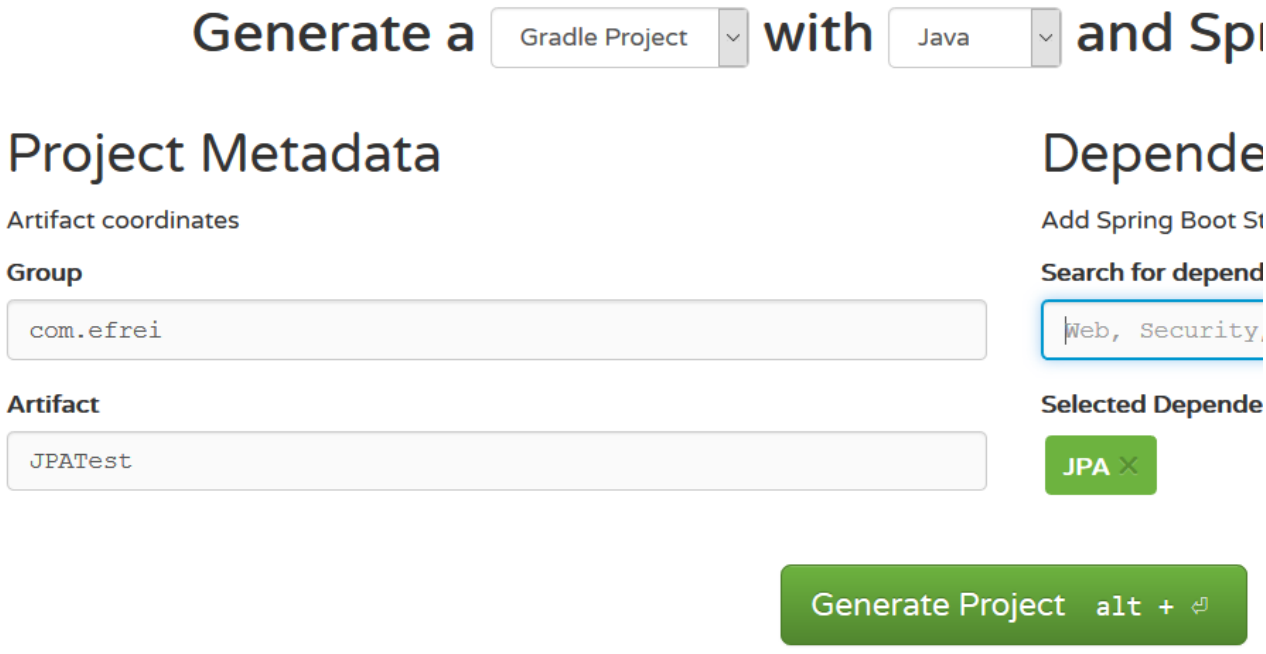
- Java JDK only version 1.6 - 1.8
- Eclipse
- Gradle
- JPA

STEP 1. Create a Gradle project.

- Use the provided template and make import as an existing Gradle project https://github.com/olgamelekhova/jpa_tpl/releases

OR

- Use the Spring Initializer (https://start.spring.io/) to create a project:
  - Don't forget to choose Gradle Projetct
  - Give it a name (Articfact)
  - Add JPA as dependencies (library)



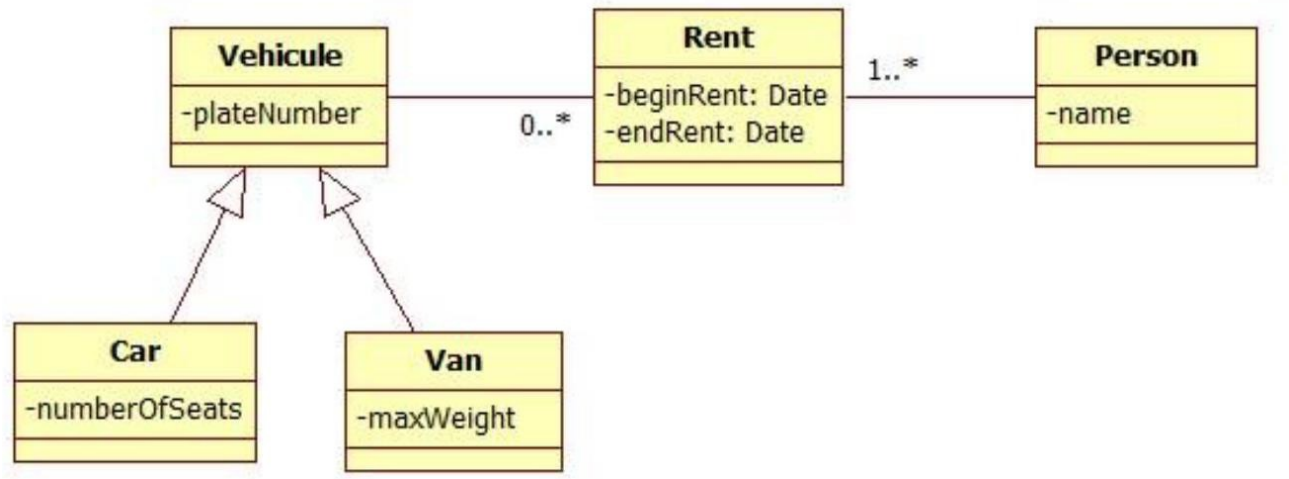
- Download and unzip the project (outside the Eclipse workspace)
- The easiest way to deal with a database in to use an in memory one. Such a database can be H2. In order to use it edit the file build.gradle an add H2 in the dependencies :

```
dependencies {
	implementation('org.springframework.boot:spring-boot-starter-data-jpa')
	compile("com.h2database:h2") // add in-memory database H2
	testImplementation('org.springframework.boot:spring-boot-starter-test')
}
```

- Import the project under Eclipse: File->Import->Gradle-> Existing gradle project into workspace... select the project directory
- Launch the main program

EXERCICE :

Use the follow class diagram :



1. Write the classes represented into the class diagram:

Vehicule	Abstract class for Car and Van. Note : can be included in more than one rent.
Car	Inherits methods and properties of Vehicule
Van	Inherits methods and properties of Vehicule
Rent	**Note** : Instance of class cannot be created without person dependency
Person	**Note :** Can have more than one rent

2. Write the following repositories to work with entities (find*, save) :

VehiculeRepository	For all types of Vehicules
RentRepository	For Rent entities
RersonRepository	For Person entities

NOTE : An example of a JPA project using Spring Data is given:
https://github.com/charroux/JPAExample/

It contains two entities:

- https://github.com/charroux/JPAExample/blob/master/src/main/java/com/efrei/JPAExample/City.java
- https://github.com/charroux/JPAExample/blob/master/src/main/java/com/efrei/JPAExample/Person.java

Repository with autogenerated methods to work with database entities:

https://github.com/charroux/JPAExample/blob/master/src/main/java/com/efrei/JPAExample/CityRepository.java

And a main program:

https://github.com/charroux/JPAExample/blob/master/src/main/java/com/efrei/JPAExample/JpaExampleApplication.java

NOTE : To persist data into a database you must choose which format will be used in the dates. See http://docs.oracle.com/javaee/6/api/javax/ /Temporal.html.