免费电子书

学习

jpa

Free unaffiliated eBook created from
Stack Overflow contributors.

#jpa

1: jpa

JPAJava Persistence APIJava。ORM。JDBC。Java。

JPA。。JPA 2.1EclipseLink JPA 2.1“”; HibernateDataNucleus 。

Java。JPA。JPAJava。

-
-
-
-
-

1.0	JSR-220	2006-11-06
2.0	JSR-317	2009-12-10
2.1	JSR-338	2013522

Examples

EclipseLink

EclipselinkJPA API。Maven

```
<dependencies>
  <dependency>
    <groupId>org.eclipse.persistence</groupId>
    <artifactId>eclipselink</artifactId>
    <version>2.6.3</version>
  </dependency>
  <dependency>
    <groupId>org.eclipse.persistence</groupId>
    <artifactId>javax.persistence</artifactId>
    <version>2.1.1</version>
  </dependency>
  <!-- ... -->
</dependencies>
```

Hibernate-core。Maven

```
<dependencies>
  <dependency>
    <!-- requires Java8! -->
    <!-- as of 5.2, hibernate-entitymanager is merged into hibernate-core -->
    <groupId>org.hibernate</groupId>
    <artifactId>hibernate-core</artifactId>
    <version>5.2.1.Final</version>
```

```
  </dependency>
  <dependency>
    <groupId>org.hibernate.javax.persistence</groupId>
    <artifactId>hibernate-jpa-2.1-api</artifactId>
    <version>1.0.0</version>
  </dependency>
  <!-- ... -->
</dependencies>
```

DataNucleus

datanucleus-coredatanucleus-api-jpadatanucleus-rdbmsRDBMS。 Maven

```
<dependencies>
  <dependency>
    <groupId>org.datanucleus</groupId>
    <artifactId>datanucleus-core</artifactId>
    <version>5.0.0-release</version>
  </dependency>
  <dependency>
    <groupId>org.datanucleus</groupId>
    <artifactId>datanucleus-api-jpa</artifactId>
    <version>5.0.0-release</version>
  </dependency>
  <dependency>
    <groupId>org.datanucleus</groupId>
    <artifactId>datanucleus-rdbms</artifactId>
    <version>5.0.0-release</version>
  </dependency>
  <dependency>
    <groupId>org.datanucleus</groupId>
    <artifactId>javax.persistence</artifactId>
    <version>2.1.2</version>
  </dependency>
  <!-- ... -->
</dependencies>
```

JPA*persistence.xml* CLASSPATH`META-INF`。 JPA。

JPA*orm.xml* `META-INF` 。 JPAJava/。

persistence.xml

HibernateH2 DB

```
<?xml version="1.0" encoding="UTF-8"?>
<persistence xmlns="http://java.sun.com/xml/ns/persistence"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://java.sun.com/xml/ns/persistence
                         http://java.sun.com/xml/ns/persistence/persistence_2_1.xsd"
         version="2.1">

<persistence-unit name="persistenceUnit">
    <provider>org.hibernate.ejb.HibernatePersistence</provider>
```

```
    <class>my.application.entities.MyEntity</class>

    <properties>
        <property name="javax.persistence.jdbc.driver" value="org.h2.Driver" />
        <property name="javax.persistence.jdbc.url" value="jdbc:h2:data/myDB.db" />
        <property name="javax.persistence.jdbc.user" value="sa" />

        <!-- DDL change options -->
        <property name="javax.persistence.schema-generation.database.action" value="drop-and-
create"/>

        <property name="hibernate.dialect" value="org.hibernate.dialect.H2Dialect"/>
        <property name="hibernate.flushMode" value="FLUSH_AUTO" />
    </properties>
</persistence-unit>
</persistence>
```

EclipselinkH2 DB

```
<?xml version="1.0" encoding="UTF-8"?>
<persistence xmlns="http://java.sun.com/xml/ns/persistence"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://java.sun.com/xml/ns/persistence
                             http://java.sun.com/xml/ns/persistence/persistence_2_1.xsd"
         version="2.1">

<persistence-unit name="persistenceUnit">
    <provider>org.eclipse.persistence.jpa.PersistenceProvider</provider>

    <class>my.application.entities.MyEntity</class>

    <properties>
        <property name="javax.persistence.jdbc.driver" value="org.h2.Driver"/>
        <property name="javax.persistence.jdbc.url" value="jdbc:h2:data/myDB.db"/>
        <property name="javax.persistence.jdbc.user" value="sa"/>

        <!-- Schema generation : drop and create tables -->
        <property name="javax.persistence.schema-generation.database.action" value="drop-and-
create-tables" />
    </properties>
</persistence-unit>

</persistence>
```

DataNucleusH2 DB

```
<?xml version="1.0" encoding="UTF-8"?>
<persistence xmlns="http://java.sun.com/xml/ns/persistence"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://java.sun.com/xml/ns/persistence
                             http://java.sun.com/xml/ns/persistence/persistence_2_1.xsd"
         version="2.1">

<persistence-unit name="persistenceUnit">
    <provider>org.datanucleus.api.jpa.PersistenceProviderImpl</provider>
```

```
    <class>my.application.entities.MyEntity</class>

    <properties>
        <property name="javax.persistence.jdbc.driver" value="org.h2.Driver"/>
        <property name="javax.persistence.jdbc.url" value="jdbc:h2:data/myDB.db"/>
        <property name="javax.persistence.jdbc.user" value="sa"/>

        <!-- Schema generation : drop and create tables -->
        <property name="javax.persistence.schema-generation.database.action" value="drop-and-
create-tables" />
    </properties>
</persistence-unit>

</persistence>
```

Hallo World。

1. JPA 2.1
2. `persistence-unit`
3.
4. DAO
5.

---

maven

```
<dependencies>

    <!-- JPA is a spec, I'll use the implementation with HIBERNATE -->
    <dependency>
        <groupId>org.hibernate</groupId>
        <artifactId>hibernate-entitymanager</artifactId>
        <version>5.2.6.Final</version>
    </dependency>

    <!-- JDBC Driver, use in memory DB -->
    <dependency>
        <groupId>com.h2database</groupId>
        <artifactId>h2</artifactId>
        <version>1.4.193</version>
    </dependency>

</dependencies>
```

---

resources`persistence.xml`。

```
<persistence-unit name="hello-jpa-pu" transaction-type="RESOURCE_LOCAL">
    <provider>org.hibernate.jpa.HibernatePersistenceProvider</provider>

    <properties>
        <!-- ~ = relative to current user home directory -->
        <property name="javax.persistence.jdbc.url" value="jdbc:h2:./test.db"/>
        <property name="javax.persistence.jdbc.user" value=""/>
        <property name="javax.persistence.jdbc.password" value=""/>
```

```
        <property name="javax.persistence.jdbc.driver" value="org.h2.Driver"/>
        <property name="hibernate.dialect" value="org.hibernate.dialect.H2Dialect"/>
        <property name="hibernate.show_sql" value="true"/>

        <!-- This create automatically the DDL of the database's table -->
        <property name="hibernate.hbm2ddl.auto" value="create-drop"/>

    </properties>
</persistence-unit>
```

Biker

```
package it.hello.jpa.entities;


import javax.persistence.*;
import java.io.Serializable;
import java.util.Date;
import java.util.List;

@Entity
@Table(name = "BIKER")
public class Biker implements Serializable {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private Long id;

    @Column(name = "bikerName")
    private String name;

    @Column(unique = true, updatable = false)
    private String battleName;

    private Boolean beard;

    @Temporal(TemporalType.DATE)
    private Date birthday;

    @Temporal(TemporalType.TIME)
    private Date registrationDate;

    @Transient // --> this annotiation make the field transient only for JPA
    private String criminalRecord;

    public Long getId() {
        return this.id;
    }

    public void setId(Long id) {
        this.id = id;
    }

    public String getName() {
        return this.name;
    }

    public void setName(String name) {
        this.name = name;
```

```
    }

    public String getBattleName() {
        return battleName;
    }

    public void setBattleName(String battleName) {
        this.battleName = battleName;
    }

    public Boolean getBeard() {
        return this.beard;
    }

    public void setBeard(Boolean beard) {
        this.beard = beard;
    }

    public Date getBirthday() {
        return birthday;
    }

    public void setBirthday(Date birthday) {
        this.birthday = birthday;
    }

    public Date getRegistrationDate() {
        return registrationDate;
    }

    public void setRegistrationDate(Date registrationDate) {
        this.registrationDate = registrationDate;
    }

    public String getCriminalRecord() {
        return criminalRecord;
    }

    public void setCriminalRecord(String criminalRecord) {
        this.criminalRecord = criminalRecord;
    }
}
```

DAO

```
package it.hello.jpa.business;

import it.hello.jpa.entities.Biker;

import javax.persistence.EntityManager;
import java.util.List;

public class MotorcycleRally {

    public Biker saveBiker(Biker biker) {
        EntityManager em = EntityManagerUtil.getEntityManager();
        em.getTransaction().begin();
        em.persist(biker);
```

```
        em.getTransaction().commit();
        return biker;
    }

}
```

EntityManagerUtil

```
package it.hello.jpa.utils;

import javax.persistence.EntityManager;
import javax.persistence.EntityManagerFactory;
import javax.persistence.Persistence;

public class EntityManagerUtil {

    // USE THE SAME NAME IN persistence.xml!
    public static final String PERSISTENCE_UNIT_NAME = "hello-jpa-pu";

    private static EntityManager entityManager;

    private EntityManagerUtil() {
    }

    public static EntityManager getEntityManager() {
        if (entityManager == null) {
            // the same in persistence.xml
            EntityManagerFactory emFactory =
Persistence.createEntityManagerFactory(PERSISTENCE_UNIT_NAME);


            return emFactory.createEntityManager();
        }
        return entityManager;
    }
}
```

---

it.hello.jpa.test;

TestJpa {

```
@Test
public void insertBiker() {
    MotorcycleRally crud = new MotorcycleRally();

    Biker biker = new Biker();
    biker.setName("Manuel");
    biker.setBeard(false);

    biker = crud.saveBiker(biker);

    Assert.assertEquals(biker.getId(), Long.valueOf(1L));
}
```

}

it.hello.jpa.test.TestJpa Hibernatedrop table BIKERHibernatedrop sequence if if hibernate_sequence Hibernatehibernate_sequence11 Hibernatecreate table BIKERid bigint not nullbattleName varchar255 bikerName varchar255registrationDateid Hibernatealter table BIKER add constraint UK_a64ce28nywyk8wqrvfkkuapli unique battleNameHibernateBIKERbattleNamebikerNameregistrationDate idmar 01,2017 11:00:02 PM org.hibernate.jpa.internal.util.LogHelper logPersistenceUnitInformation INFOHHH000204PersistenceUnitInfo [namehello- jpa-pu ...]

1000

jpa https://riptutorial.com/zh-CN/jpa/topic/2125/jpa

2:

@TableGenerator	
@GeneratedValue	
@OneToOne	Employee
mappedBy	。

Examples

。

Employee.java

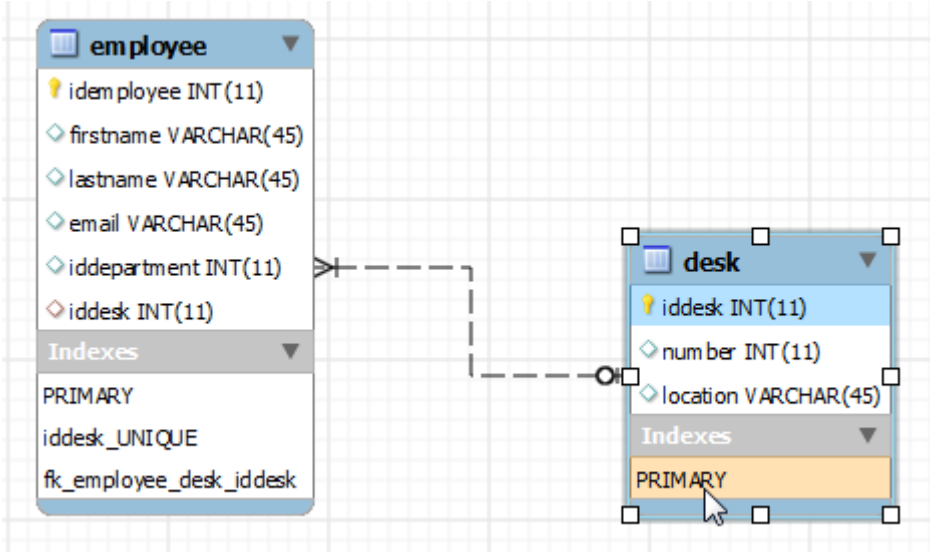
```
@Entity
public class Employee {

    @TableGenerator(name = "employee_gen", table = "id_gen", pkColumnName = "gen_name",
valueColumnName = "gen_val", allocationSize = 100)
    @Id
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "employee_gen")
    private int idemployee;
    private String firstname;
    private String lastname;
    private String email;

    @OneToOne
    @JoinColumn(name = "iddesk")
    private Desk desk;

    // getters and setters
}
```

Desk.java

```
@Entity
public class Desk {

    @TableGenerator(table = "id_gen", name = "desk_gen", pkColumnName = "gen_name",
valueColumnName = "gen_value", allocationSize = 1)
    @Id
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "desk_gen")
    private int iddesk;
    private int number;
    private String location;
    @OneToOne(mappedBy = "desk")
    private Employee employee;

    // getters and setters
```

```
}
```

```
/* Create EntityManagerFactory */
    EntityManagerFactory emf = Persistence
            .createEntityManagerFactory("JPAExamples");

    /* Create EntityManager */
    EntityManager em = emf.createEntityManager();

    Employee employee;

    employee = new Employee();
    employee.setFirstname("pranil");
    employee.setLastname("gilda");
    employee.setEmail("sdfsdf");

    Desk desk = em.find(Desk.class, 1); // retrieves desk from database
    employee.setDesk(desk);

    em.persist(employee);

    desk = em.find(Desk.class, 1); // retrieves desk from database
    desk.setEmployee(employee);
    System.out.println(desk.getEmployee());
```



。

- **@JoinColumn**colulmn。。Employee**@JoinColumn**EmployeeDesk。
- **mappedBy@OneToOne**。。Desk。

https://riptutorial.com/zh-CN/jpa/topic/6474/

3:

@TableGenerator	
@GeneratedValue	
@ManyToOne	EmployeeDepartment
@OneToManymappedBy = “”	Employee@ManyToOneEmployeeDepartment

Examples

◦ ◦

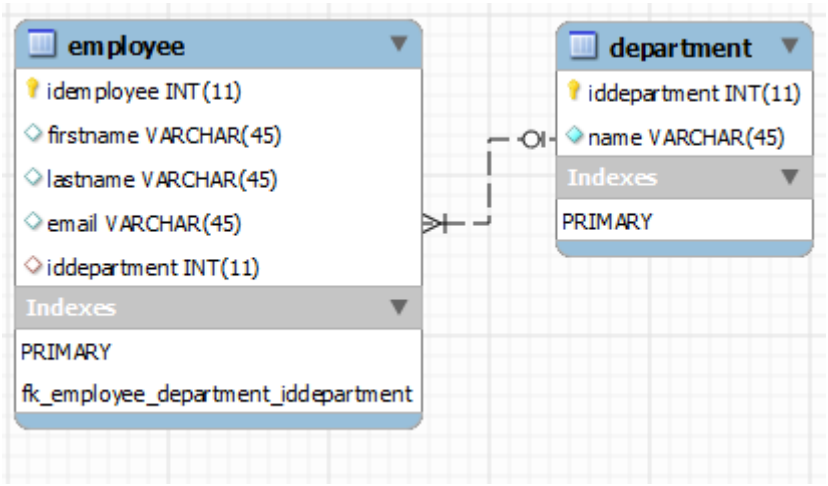
Employee.java

```
@Entity
public class Employee {

    @TableGenerator(name = "employee_gen", table = "id_gen", pkColumnName = "gen_name",
valueColumnName = "gen_val", allocationSize = 100)
    @Id
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "employee_gen")
    private int idemployee;
    private String firstname;
    private String lastname;
    private String email;

    @ManyToOne
    @JoinColumn(name = "iddepartment")
    private Department department;

    // getters and setters
}
```

Department.java

```
@Entity
public class Department {

    @TableGenerator(table = "id_gen", pkColumnName = "gen_name", valueColumnName = "gen_val",
name = "department_gen", allocationSize = 1)
    @Id
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "department_gen")
    private int iddepartment;
    private String name;

    @OneToMany(mappedBy = "department")
    private List<Employee> employees;

    // getters and setters
```

```
}
```



。

jpa

- 。 。
- mappedBy。

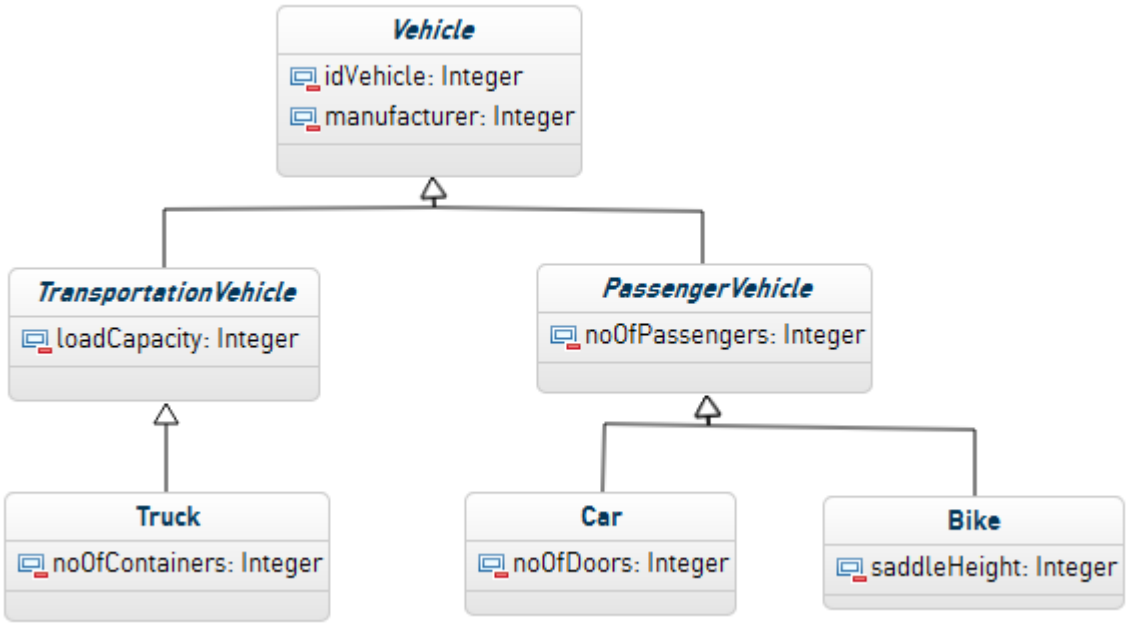
https://riptutorial.com/zh-CN/jpa/topic/6529/

4:

@	
@DiscriminatorColumn	ID
@MappedSuperclass	◦ java@MapperSuperClass

Examples

SampleJPA◦




```
@Entity
@Table(name = "VEHICLE")
@Inheritance(strategy = InheritanceType.JOINED)
@DiscriminatorColumn(name = "VEHICLE_TYPE")
public abstract class Vehicle {

    @TableGenerator(name = "VEHICLE_GEN", table = "ID_GEN", pkColumnName = "GEN_NAME",
valueColumnName = "GEN_VAL", allocationSize = 1)
    @Id
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "VEHICLE_GEN")
    private int idVehicle;
    private String manufacturer;

    // getters and setters
}
```

TransportationVehicle.java

```
@MappedSuperclass
public abstract class TransportationVehicle extends Vehicle {

    private int loadCapacity;

    // getters and setters
}
```

Truck.java

```
@Entity
public class Truck extends TransportationVehicle {

    private int noOfContainers;

    // getters and setters

}
```

PassengerVehicle.java

```
@MappedSuperclass
public abstract class PassengerVehicle extends Vehicle {

    private int noOfpassengers;

    // getters and setters
}
```

Car.java

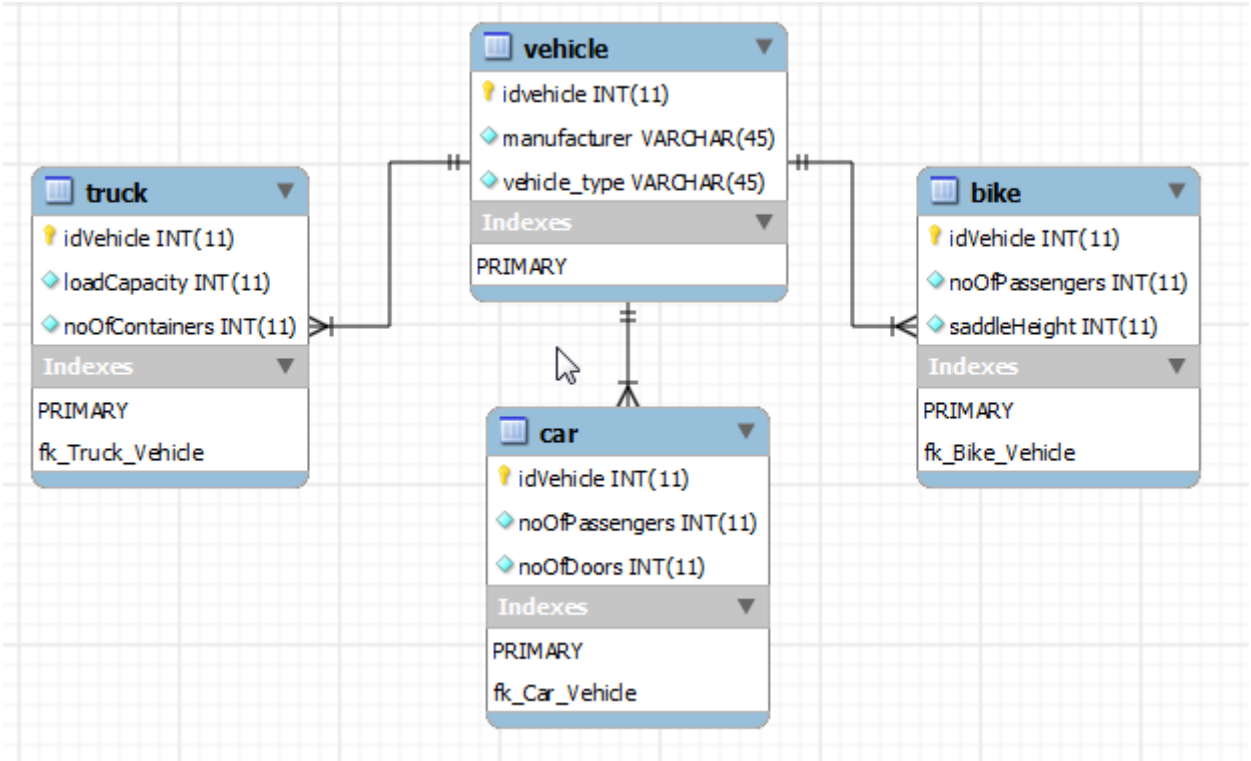
```
@Entity
public class Car extends PassengerVehicle {

    private int noOfDoors;

    // getters and setters
}
```

Bike.java

```
@Entity
public class Bike extends PassengerVehicle {

    private int saddleHeight;

    // getters and setters

}
```

```
/* Create EntityManagerFactory */
EntityManagerFactory emf = Persistence
        .createEntityManagerFactory("AdvancedMapping");

/* Create EntityManager */
```

```
EntityManager em = emf.createEntityManager();
EntityTransaction transaction = em.getTransaction();

transaction.begin();

Bike cbr1000rr = new Bike();
cbr1000rr.setManufacturer("honda");
cbr1000rr.setNoOfpassengers(1);
cbr1000rr.setSaddleHeight(30);
em.persist(cbr1000rr);

Car aventador = new Car();
aventador.setManufacturer("lamborghini");
aventador.setNoOfDoors(2);
aventador.setNoOfpassengers(2);
em.persist(aventador);

Truck truck = new Truck();
truck.setLoadCapacity(1000);
truck.setManufacturer("volvo");
truck.setNoOfContainers(2);
em.persist(truck);

transaction.commit();
```



-
-
-

https://riptutorial.com/zh-CN/jpa/topic/6473/

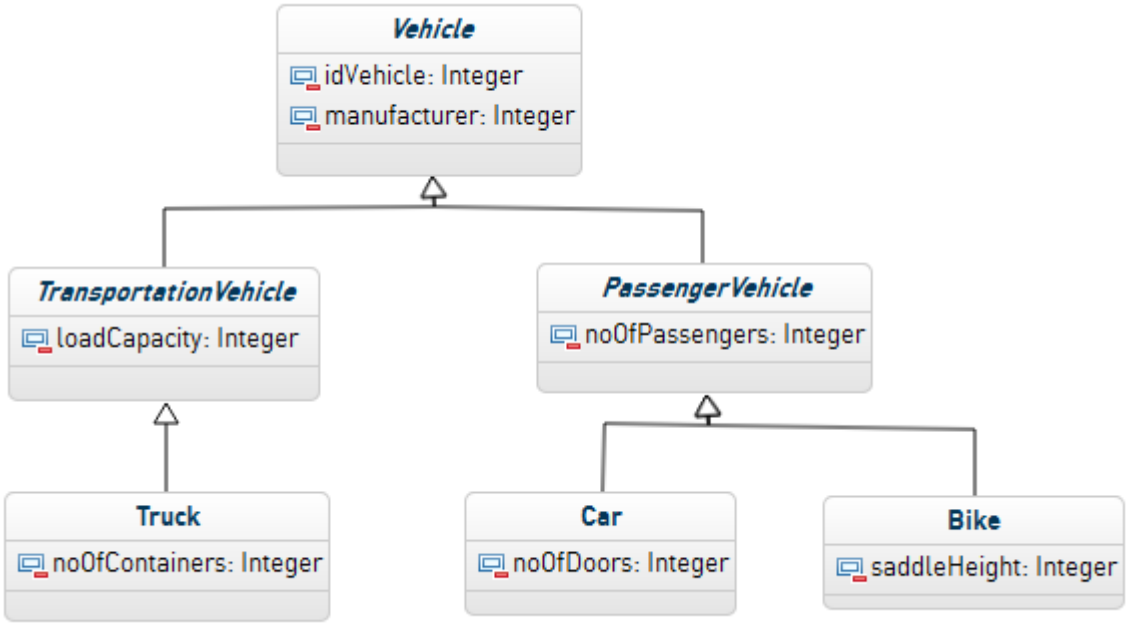
5:

@	
@DiscriminatorColumn	ID
@MappedSuperclass	◦ java@MapperSuperClass
@DiscriminatorValue	@DiscriminatorColumn◦

◦

Examples

Vehicle◦




```
package com.thejavageek.jpa.entities;

import javax.persistence.DiscriminatorColumn;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.Inheritance;
import javax.persistence.InheritanceType;
import javax.persistence.Table;
import javax.persistence.TableGenerator;

@Entity
@Table(name = "VEHICLE")
```

```
@Inheritance(strategy = InheritanceType.SINGLE_TABLE)
@DiscriminatorColumn(name = "VEHICLE_TYPE")
public abstract class Vehicle {

    @TableGenerator(name = "VEHICLE_GEN", table = "ID_GEN", pkColumnName = "GEN_NAME",
valueColumnName = "GEN_VAL", allocationSize = 1)
    @Id
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "VEHICLE_GEN")
    private int idVehicle;
    private String manufacturer;

    public int getIdVehicle() {
        return idVehicle;
    }

    public void setIdVehicle(int idVehicle) {
        this.idVehicle = idVehicle;
    }

    public String getManufacturer() {
        return manufacturer;
    }

    public void setManufacturer(String manufacturer) {
        this.manufacturer = manufacturer;
    }

}
```

TransportableVehicle.javacom.thejavageek.jpa.entities;

import javax.persistence.MappedSuperclass;

```
@MappedSuperclass
public abstract class TransportationVehicle extends Vehicle {

    private int loadCapacity;

    public int getLoadCapacity() {
        return loadCapacity;
    }

    public void setLoadCapacity(int loadCapacity) {
        this.loadCapacity = loadCapacity;
    }

}
```

PassengerVehicle.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.MappedSuperclass;

@MappedSuperclass
public abstract class PassengerVehicle extends Vehicle {

    private int noOfpassengers;
```

```
    public int getNoOfpassengers() {
        return noOfpassengers;
    }

    public void setNoOfpassengers(int noOfpassengers) {
        this.noOfpassengers = noOfpassengers;
    }

}
```

Truck.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.DiscriminatorValue;
import javax.persistence.Entity;

@Entity
@DiscriminatorValue(value = "Truck")
public class Truck extends TransportationVehicle{

    private int noOfContainers;

    public int getNoOfContainers() {
        return noOfContainers;
    }

    public void setNoOfContainers(int noOfContainers) {
        this.noOfContainers = noOfContainers;
    }

}
```

Bike.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.DiscriminatorValue;
import javax.persistence.Entity;

@Entity
@DiscriminatorValue(value = "Bike")
public class Bike extends PassengerVehicle {

    private int saddleHeight;

    public int getSaddleHeight() {
        return saddleHeight;
    }

    public void setSaddleHeight(int saddleHeight) {
        this.saddleHeight = saddleHeight;
    }

}
```

Car.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.DiscriminatorValue;
import javax.persistence.Entity;

@Entity
@DiscriminatorValue(value = "Car")
public class Car extends PassengerVehicle {

    private int noOfDoors;

    public int getNoOfDoors() {
        return noOfDoors;
    }

    public void setNoOfDoors(int noOfDoors) {
        this.noOfDoors = noOfDoors;
    }

}
```

```
/* Create EntityManagerFactory */
EntityManagerFactory emf = Persistence
            .createEntityManagerFactory("AdvancedMapping");

/* Create EntityManager */
EntityManager em = emf.createEntityManager();
EntityTransaction transaction = em.getTransaction();
transaction.begin();

Bike cbr1000rr = new Bike();
cbr1000rr.setManufacturer("honda");
cbr1000rr.setNoOfpassengers(1);
cbr1000rr.setSaddleHeight(30);
em.persist(cbr1000rr);

Car avantador = new Car();
avantador.setManufacturer("lamborghini");
avantador.setNoOfDoors(2);
avantador.setNoOfpassengers(2);
em.persist(avantador);

Truck truck = new Truck();
truck.setLoadCapacity(100);
truck.setManufacturer("mercedes");
truck.setNoOfContainers(2);
em.persist(truck);

transaction.commit();
```

https://riptutorial.com/zh-CN/jpa/topic/6277/

6:

@Id	/
@Basic	◦ String DateCalendar ◦ ◦
@Transient	transient◦

◦ Java;◦

Examples

```
@Entity
class Note {
    @Id
    Integer id;

    @Basic
    String note;

    @Basic
    int count;
}
```

JPA◦

JavaPostgres

```
CREATE TABLE Note (
  id integer NOT NULL,
  note text,
  count integer NOT NULL
)
```

JPADDLDDL◦ DDL◦

```
@Entity
class Note {
    @Id
    Integer id;

    @Basic
    String note;

    @Transient
    String parsedNote;

    String readParsedNote() {
        if (parsedNote == null) { /* initialize from note */ }
        return parsedNote;
```

```
    }
}
```

`@Transient` ◦ `null` ◦

Java`DateCalendar LocalDateLocalDateTime` ◦ `Timestamp Instant ZonedLocalDateTime`Joda-time◦ `time datetimestamp` ◦

Java 8

Java-8`java.util.Date java.util.Calendarjava.sql.Timestamp`SQL`timestamp ;java.sql.Datedate` ◦

```
@Entity
class Times {
    @Id
    private Integer id;

    @Basic
    private Timestamp timestamp;

    @Basic
    private java.sql.Date sqldate;

    @Basic
    private java.util.Date utildate;

    @Basic
    private Calendar calendar;
}
```

```
CREATE TABLE times (
    id integer not null,
    timestamp timestamp,
    sqldate date,
    utildate timestamp,
    calendar timestamp
)
```

◦ Java `DateCalendar◦ @Temporal◦`

```
@Entity
class Times {
    @Id
    private Integer id;

    @Temporal(TemporalType.TIME)
    private Date date;

    @Temporal(TemporalType.DATE)
    private Calendar calendar;
}
```

SQL

```
CREATE TABLE times (
    id integer not null,
    date time,
    calendar date
)
```

1 `@Temporal`DDL;`dateDate@Basic`。

2 `Calendartime` 。

Java 8

JPA 2.1 Java 8`java.time`。 JPA 2.1。

DataNucleus`@Temporal`。

HibernateHibernate 5.2+`@Basic`。 Hibernate 5.0-5.1`org.hibernate:hibernate-java8` 。

- `date LocalDate`
- `Instant LocalDateTimeZonedDateTimetimestamp`

`java.time`Java 8 `java.time`JPA 2.1 `AttributeConverter` 。

Id

`userUid` SEQUENCE。 SEQUENCE`USER_UID_SEQ` DBAJPA。

```
@Entity
@Table(name="USER")
public class User implements Serializable {
    private static final long serialVersionUID = 1L;

    @Id
    @SequenceGenerator(name="USER_UID_GENERATOR", sequenceName="USER_UID_SEQ")
    @GeneratedValue(strategy=GenerationType.SEQUENCE, generator="USER_UID_GENERATOR")
    private Long userUid;

    @Basic
    private String userName;
}
```

https://riptutorial.com/zh-CN/jpa/topic/3691/

7:

@TableGenerator	ID
@GeneratedValue	
@ID	
@ManyToOne	EmployeeDepartment。。。Employee@ManyToOne。
@JoinColumn	

Examples

ManyToOne

```
@Entity
public class Employee {

    @TableGenerator(name = "employee_gen", table = "id_gen", pkColumnName = "gen_name",
valueColumnName = "gen_val", allocationSize = 1)
    @Id
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "employee_gen")
    private int idemployee;
    private String firstname;
    private String lastname;
    private String email;

    @ManyToOne
    @JoinColumn(name = "iddepartment")
    private Department department;

    // getters and setters
    // toString implementation
}
```

```
@Entity
public class Department {

    @Id
    private int iddepartment;
    private String name;

    // getters, setters and toString()
}
```

```
public class Test {

    public static void main(String[] args) {
```

```
        EntityManagerFactory emf = Persistence
                .createEntityManagerFactory("JPAExamples");
        EntityManager em = emf.createEntityManager();
        EntityTransaction txn = em.getTransaction();

        Employee employee = new Employee();
        employee.setEmail("someMail@gmail.com");
        employee.setFirstname("Prasad");
        employee.setLastname("kharkar");

        txn.begin();
        Department department = em.find(Department.class, 1);//returns the department named
vert
        System.out.println(department);
        txn.commit();

        employee.setDepartment(department);

        txn.begin();
        em.persist(employee);
        txn.commit();

    }

}
```

https://riptutorial.com/zh-CN/jpa/topic/6531/

8:

ManyToMany@ManyToMany。

@OneToMany ManyToMany。

@TableGenerator	GeneratedValue
@GeneratedValue	。 Id。
@ManyToMany	EmployeeProject。
mappedBy="projects"	EmployeeProject
@JoinColumn	
@JoinTable	

- @TableGenerator@GeneratedValuejpaID。
- @ManyToManyEmployeeProject。
- @JoinTablejpaname =“employee_project”EmployeeProject。 jpa。
- @JoinColumn@ inverseJoinColumn。 。 。 Employee@JoinColumnemployee_project idemployee@InverseJoinColumnidprojectjpa。
- Project@ManyToManymappedBy = projectsEmployee。

Examples

。

```
package com.thejavageek.jpa.entities;

import java.util.List;

import javax.persistence.CascadeType;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.JoinColumn;
import javax.persistence.JoinTable;
import javax.persistence.ManyToMany;
import javax.persistence.TableGenerator;

@Entity
public class Employee {

    @TableGenerator(name = "employee_gen", table = "id_gen", pkColumnName = "gen_name",
valueColumnName = "gen_val", allocationSize = 100)
    @Id
```

```
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "employee_gen")
    private int idemployee;
    private String name;

    @ManyToMany(cascade = CascadeType.PERSIST)
    @JoinTable(name = "employee_project", joinColumns = @JoinColumn(name = "idemployee"),
inverseJoinColumns = @JoinColumn(name = "idproject"))
    private List<Project> projects;

    public int getIdemployee() {
        return idemployee;
    }

    public void setIdemployee(int idemployee) {
        this.idemployee = idemployee;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public List<Project> getProjects() {
        return projects;
    }

    public void setProjects(List<Project> projects) {
        this.projects = projects;
    }

}
```

```
package com.thejavageek.jpa.entities;

import java.util.List;

import javax.persistence.CascadeType;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.ManyToMany;
import javax.persistence.TableGenerator;

@Entity
public class Project {

    @TableGenerator(name = "project_gen", allocationSize = 1, pkColumnName = "gen_name",
valueColumnName = "gen_val", table = "id_gen")
    @Id
    @GeneratedValue(generator = "project_gen", strategy = GenerationType.TABLE)
    private int idproject;
    private String name;

    @ManyToMany(mappedBy = "projects", cascade = CascadeType.PERSIST)
    private List<Employee> employees;
```

```
    public int getIdproject() {
        return idproject;
    }

    public void setIdproject(int idproject) {
        this.idproject = idproject;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public List<Employee> getEmployees() {
        return employees;
    }

    public void setEmployees(List<Employee> employees) {
        this.employees = employees;
    }

}
```

/ *EntityManagerFactory * / EntityManagerFactory emf = Persistence .createEntityManagerFactory “JPAExamples”;

```
    /* Create EntityManager */
    EntityManager em = emf.createEntityManager();

    EntityTransaction transaction = em.getTransaction();

    transaction.begin();

    Employee prasad = new Employee();
    prasad.setName("prasad kharkar");

    Employee harish = new Employee();
    harish.setName("Harish taware");

    Project ceg = new Project();
    ceg.setName("CEG");

    Project gtt = new Project();
    gtt.setName("GTT");

    List<Project> projects = new ArrayList<Project>();
    projects.add(ceg);
    projects.add(gtt);

    List<Employee> employees = new ArrayList<Employee>();
    employees.add(prasad);
    employees.add(harish);

    ceg.setEmployees(employees);
    gtt.setEmployees(employees);

    prasad.setProjects(projects);
```

```
    harish.setProjects(projects);

    em.persist(prasad);

    transaction.commit();
```

Embeddable

```
Role:
+-----------------------------+
| roleId | name | discription |
+-----------------------------+


Rights:
+-----------------------------+
| rightId | name | discription|
+-----------------------------+

rightrole
+------------------+
| roleId | rightId |
+------------------+
```

rightroleJPAEmbeddable。

rightrole

```
    @Entity
    @Table(name = "rightrole")
    public class RightRole extends BaseEntity<RightRolePK> {

        private static final long serialVersionUID = 1L;

        @EmbeddedId
        protected RightRolePK rightRolePK;


        @JoinColumn(name = "roleID", referencedColumnName = "roleID", insertable = false,
updatable = false)
        @ManyToOne(fetch = FetchType.LAZY)
        private Role role;

        @JoinColumn(name = "rightID", referencedColumnName = "rightID", insertable = false,
updatable = false)
        @ManyToOne(fetch = FetchType.LAZY)
        private Right right;

        ......
     }


    @Embeddable
    public class RightRolePK implements Serializable {
    private static final long serialVersionUID = 1L;

      @Basic(optional = false)
      @NotNull
```

```
      @Column(nullable = false)
      private long roleID;

      @Basic(optional = false)
      @NotNull
      @Column(nullable = false)
     private long rightID;

   .....

}
```

。

rightsrole store(persist) roleflushid。 rightrole。

。

```
@Entity
@Table(name = "role")
public class Role {

    private static final long serialVersionUID = 1L;

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Basic(optional = false)
    @NotNull
    @Column(nullable = false)
    private Long roleID;


    @OneToMany(cascade = CascadeType.ALL, mappedBy = "role", fetch = FetchType.LAZY)
    private List<RightRole> rightRoleList;

    @ManyToMany(cascade = {CascadeType.PERSIST})
    @JoinTable(name = "rightrole",
            joinColumns = {
                @JoinColumn(name = "roleID", referencedColumnName = "ROLE_ID")},
            inverseJoinColumns = {
                @JoinColumn(name = "rightID", referencedColumnName = "RIGHT_ID")})
    private List<Right> rightList;
.......
}
```

@JoinTable`rightrole`rolerightid。

```
Role role = new  Role();
List<Right> rightList = new ArrayList<>();
Right right1 = new Right();
Right right2 = new Right();
rightList.add(right1);
rightList.add(right2);
role.setRightList(rightList);
```

inverseJoinColumns@ManyToManycascade = {CascadeType.PERSIST}。

https://riptutorial.com/zh-CN/jpa/topic/6532/

9:

◦

◦

◦

Examples

- ◦
- ◦
- ◦
- ◦

◦ `@OneToOne`◦

VehicleParkingPlace◦

◦

`@OneToMany`◦

`mappedBy`ManyToOne

```
  @OneToMany(mappedBy="attribute")
```

◦

`@ManyToOne`◦

`@JoinColumn(name="FK_name")`foreing◦

◦

`@ManyToMany`◦

◦

@JoinTable

JPA`@JoinTable`

```
@Entity
public class EntityA {
   @Id
```

```
    @Column(name="id")
    private long id;
    [...]
    @ManyToMany
    @JoinTable(name="table_join_A_B",
               joinColumns=@JoinColumn(name="id_A"), referencedColumnName="id"
               inverseJoinColumns=@JoinColumn(name="id_B", referencedColumnName="id"))
    private List<EntityB> entitiesB;
    [...]
}

@Entity
public class EntityB {
    @Id
    @Column(name="id")
    private long id;
    [...]
}
```

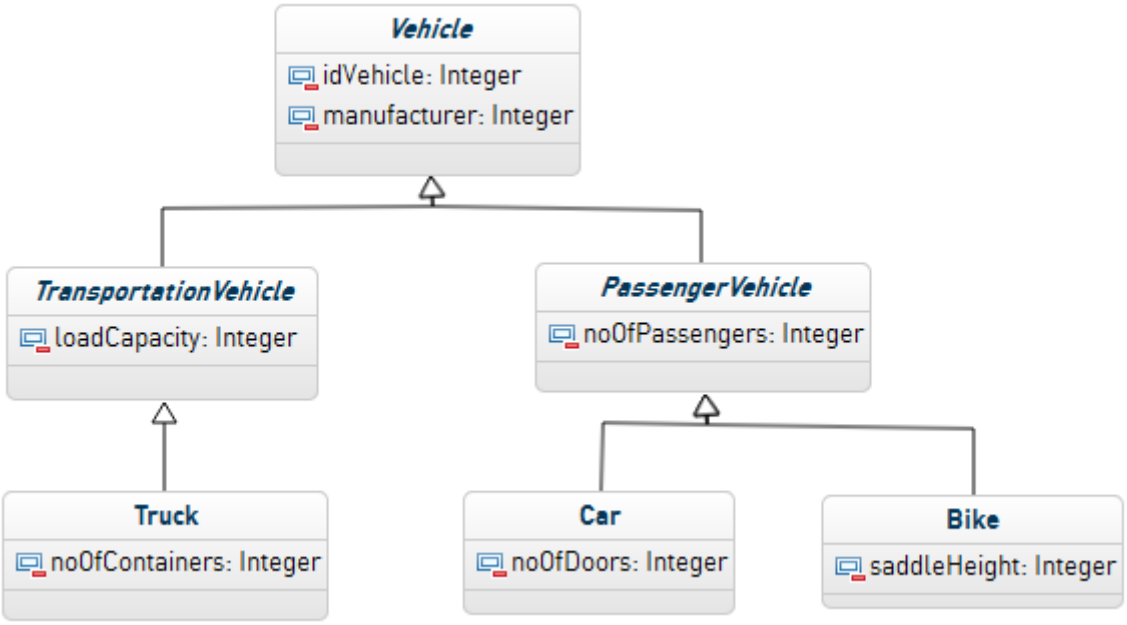
EntityAEntityB`entitiesB`@JoinTable`table_join_A_B` `id_A`id_B` EntityAEntityB`id` ; `(id_A,id_B)` `table_join_A_B`。

https://riptutorial.com/zh-CN/jpa/topic/6305/

10:

- VehicleTransportationVehiclePassengerVehicle。
- 。 @MappedSuperClass。
- TruckTransportationVehicleVehicle。
- CarBikePassengerVehicleVehicle。

Examples



。

Vehicle.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.Inheritance;
import javax.persistence.InheritanceType;
import javax.persistence.TableGenerator;

@Entity
@Inheritance(strategy = InheritanceType.TABLE_PER_CLASS)
public abstract class Vehicle {

    @TableGenerator(name = "VEHICLE_GEN", table = "ID_GEN", pkColumnName = "GEN_NAME",
valueColumnName = "GEN_VAL", allocationSize = 1)
    @Id
    @GeneratedValue(strategy = GenerationType.TABLE, generator = "VEHICLE_GEN")
    private int idVehicle;
    private String manufacturer;
```

```
    public int getIdVehicle() {
        return idVehicle;
    }

    public void setIdVehicle(int idVehicle) {
        this.idVehicle = idVehicle;
    }

    public String getManufacturer() {
        return manufacturer;
    }

    public void setManufacturer(String manufacturer) {
        this.manufacturer = manufacturer;
    }

}
```

TransportationVehilcle.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.MappedSuperclass;

@MappedSuperclass
public abstract class TransportationVehicle extends Vehicle {

    private int loadCapacity;

    public int getLoadCapacity() {
        return loadCapacity;
    }

    public void setLoadCapacity(int loadCapacity) {
        this.loadCapacity = loadCapacity;
    }

}
```

Truck.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.Entity;

@Entity
public class Truck extends TransportationVehicle {

    private int noOfContainers;

    public int getNoOfContainers() {
        return noOfContainers;
    }

    public void setNoOfContainers(int noOfContainers) {
        this.noOfContainers = noOfContainers;
    }

}
```

PassengerVehicle.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.MappedSuperclass;

@MappedSuperclass
public abstract class PassengerVehicle extends Vehicle {

    private int noOfpassengers;

    public int getNoOfpassengers() {
        return noOfpassengers;
    }

    public void setNoOfpassengers(int noOfpassengers) {
        this.noOfpassengers = noOfpassengers;
    }

}
```

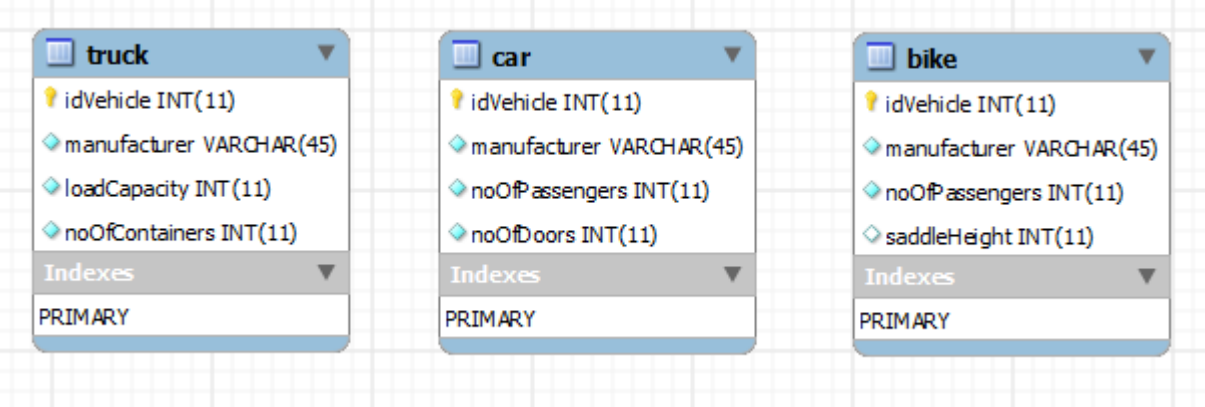
Car.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.Entity;

@Entity
public class Car extends PassengerVehicle {

    private int noOfDoors;

    public int getNoOfDoors() {
        return noOfDoors;
    }

    public void setNoOfDoors(int noOfDoors) {
        this.noOfDoors = noOfDoors;
    }

}
```

Bike.java

```
package com.thejavageek.jpa.entities;

import javax.persistence.Entity;

@Entity
public class Bike extends PassengerVehicle {

    private int saddleHeight;

    public int getSaddleHeight() {
        return saddleHeight;
    }

    public void setSaddleHeight(int saddleHeight) {
```

```
        this.saddleHeight = saddleHeight;
    }

}
```



https://riptutorial.com/zh-CN/jpa/topic/6255/

S. No		Contributors
1	jpa	Billy Frost, Community, DimaSan, , Manuel Spigolon, Michael Piefel, Neil Stockton, ppeterka
2		Prasad Kharkar
3		Prasad Kharkar
4		bw_üezi, Prasad Kharkar
5		Prasad Kharkar
6		Jeffrey Brett Coleman, Michael Piefel, Neil Stockton, Pete
7		Prasad Kharkar
8		Prasad Kharkar, Ronak Patel, Vetle
9		DimaSan,
10		Prasad Kharkar