05_JPA_项目

笔记本： 数据库

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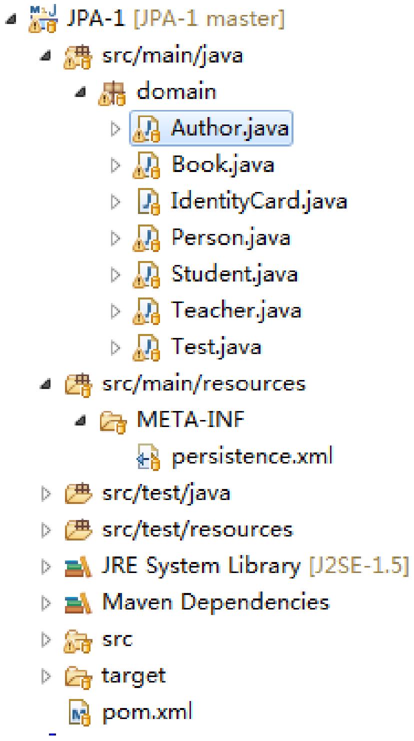
1.目录结构



```
JPA-1 [JPA-1 master]
    src/main/java
        domain
            Author.java
            Book.java
            IdentityCard.java
            Person.java
            Student.java
            Teacher.java
            Test.java
    src/main/resources
        META-INF
            persistence.xml
    src/test/java
    src/test/resources
    JRE System Library [J2SE-1.5]
    Maven Dependencies
    src
    target
    pom.xml
```

2.Author.java文件 实现一对多　一个作者有多本出版的书book

```
package domain;

import java.io.Serializable;
import java.util.List;
import java.util.Set;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.JoinColumn;
import javax.persistence.OneToMany;
import javax.persistence.SequenceGenerator;
import javax.persistence.Table;

import org.hibernate.annotations.Cascade;
import org.hibernate.annotations.CascadeType;

@Entity
@Table(name = "Author")
public class Author implements Serializable{
    private Integer id;
    private String authorName;
    private Set<Book> bookList;

    @Id
    @GeneratedValue(strategy=GenerationType.SEQUENCE,generator="generator")
    @SequenceGenerator(sequenceName="Author_SEQ",
        name="generator",initialValue=1,allocationSize=1)
    public Integer getId() {
        return id;
    }
    public void setId(Integer id) {
        this.id = id;
    }
    @Column(name = "authorName", length = 30)
    public String getAuthorName() {
        return authorName;
    }
    public void setAuthorName(String authorName) {
        this.authorName = authorName;
    }

    @OneToMany(mappedBy="author")
    @Cascade(value= {CascadeType.ALL})
    public Set<Book> getBookList() {
        return bookList;
    }
    public void setBookList(Set<Book> bookList) {
        this.bookList = bookList;
    }
    @Override
    public String toString() {
        return "Author [id=" + id + ", authorName=" + authorName + "]";
    }

}
```

3.Book.java 文件　多对一，多本book有同一个作者author

```
package domain;

import java.io.Serializable;
import java.math.BigDecimal;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.JoinColumn;
import javax.persistence.ManyToOne;
import javax.persistence.SequenceGenerator;
import javax.persistence.Table;

import org.hibernate.annotations.Cascade;
import org.hibernate.annotations.CascadeType;

@Entity
@Table(name = "Book")
public class Book implements Serializable{
    private Integer id;
    private String bookName;
    private Float price;
    private Author author;

    public Book() {
    }

    public Book(String bookName, Float price) {
        this.bookName = bookName;
        this.price = price;
    }

    @Id
    @GeneratedValue(strategy=GenerationType.SEQUENCE,generator="generator")
    @SequenceGenerator(sequenceName="Book_SEQ",
        name="generator",initialValue=1,allocationSize=1)
    public Integer getId() {
        return id;
    }
    public void setId(Integer id) {
        this.id = id;
    }

    @Column(name = "bookName", length = 30)
    public String getBookName() {
        return bookName;
    }
    public void setBookName(String bookName) {
        this.bookName = bookName;
    }


    @Column(name = "price",columnDefinition="decimal(4,2)")
    public Float getPrice() {
        return price;
    }
    public void setPrice(Float price) {
        this.price = price;
    }

    @ManyToOne
    @JoinColumn(name="author_id")
    @Cascade(CascadeType.SAVE_UPDATE)
    public Author getAuthor() {
        return author;
    }

    public void setAuthor(Author author) {
        this.author = author;
    }

    @Override
    public String toString() {
        return "Book [id=" + id + ", bookName=" + bookName + ", price=" + price + ", author=" + author + "]";
    }
}
```

4.Person.java 文件 一对一 一个person有专属的个人身份IdentityCard_id

```
package domain;


import java.io.Serializable;

import javax.persistence.Column;


import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.JoinColumn;
import javax.persistence.OneToOne;
import javax.persistence.SequenceGenerator;
import javax.persistence.Table;

import org.hibernate.annotations.Cascade;
import org.hibernate.annotations.CascadeType;


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

    private Integer id;
    private String name;
    private Integer age;
    private IdentityCard identityCard;


    public Person() {
    }


    @Id
    @GeneratedValue(strategy=GenerationType.SEQUENCE,generator="generator")
    @SequenceGenerator(sequenceName="person_SEQ",name="generator",
        initialValue=1,allocationSize=1)
    public Integer getId() {
        return id;
    }
    public void setId(Integer id) {
        this.id = id;
    }
    @Column(name = "name", length = 20)
    public String getName() {
        return this.name;
    }

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

    @Column(name = "age")
    public Integer getAge() {
        return this.age;
    }

    public void setAge(Integer age) {
        this.age = age;
    }

    @OneToOne
    @JoinColumn(name="IdentityCard_id")
    @Cascade(value=CascadeType.ALL)
    public IdentityCard getIdentityCard() {
        return identityCard;
    }


    public void setIdentityCard(IdentityCard identityCard) {
        this.identityCard = identityCard;
    }


    @Override
    public String toString() {
        return "Person [id=" + id + ", name=" + name + ", age=" + age + ", identityCard=" + identityCard + "]";
    }
}
```

5.IdentityCard.java 文件 一对一 每个身份id 对应专属的个人

```
package domain;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.OneToOne;
import javax.persistence.SequenceGenerator;
import javax.persistence.Table;

@Entity
@Table(name="IdentityCard")
public class IdentityCard {

    private Integer id;
    private String idNumber;
    private Person person;

    @Id
    @GeneratedValue(strategy=GenerationType.SEQUENCE,generator="generator")
    @SequenceGenerator(sequenceName="Identify_SEQ",
        name="generator",initialValue=1,allocationSize=1)
    public Integer getId() {
        return id;
    }
    public void setId(Integer id) {
        this.id = id;
    }

    @Column(name = "IdNumber", length = 20)
    public String getIdNumber() {
        return idNumber;
    }
    public void setIdNumber(String idNumber) {
        this.idNumber = idNumber;
    }

    @OneToOne(mappedBy="identityCard")
    public Person getPerson() {
        return person;
    }
    public void setPerson(Person person) {
        this.person = person;
    }
    @Override
    public String toString() {
        return "IdentityCard [id=" + id + ", idNumber=" + idNumber + "]";
    }
}
```

6.Student.java 多对多 学生对应多个老师

```
package domain;

import java.io.Serializable;
import java.util.Set;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.FetchType;
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.SequenceGenerator;
import javax.persistence.Table;

import org.hibernate.annotations.Cascade;
import org.hibernate.annotations.CascadeType;
@Entity
@Table(name = "Student")
public class Student implements Serializable{
    private Integer id;
    private String studentName;
    private Set<Teacher> teacher;

    @Id
    @GeneratedValue(strategy=GenerationType.SEQUENCE,generator="generator")
    @SequenceGenerator(sequenceName="Student_SEQ",
        name="generator",initialValue=1,allocationSize=1)
    public Integer getId() {
        return id;
    }
    public void setId(Integer id) {
        this.id = id;
    }

    @Column(name = "studentName", length = 30)
    public String getStudentName() {
        return studentName;
    }
    public void setStudentName(String studentName) {
        this.studentName = studentName;
    }

    @ManyToMany(fetch=FetchType.EAGER)
    @JoinTable(name="student_teacher",
            joinColumns= {@JoinColumn(name="student_id")},
            inverseJoinColumns= {@JoinColumn(name="teacher_id")})
    @Cascade(CascadeType.SAVE_UPDATE)
    public Set<Teacher> getTeacher() {
        return teacher;
    }
    public void setTeacher(Set<Teacher> teacher) {
        this.teacher = teacher;
    }
    @Override
    public String toString() {
        return "Student [id=" + id + ", studentName=" + studentName + ", teacher=" + teacher + "]";
    }


}
```

7.Teacher.java 多对多 老师对应多个学生

```
package domain;

import java.io.Serializable;
import java.util.Set;

import javax.persistence.Column;
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.SequenceGenerator;
import javax.persistence.Table;

import org.hibernate.annotations.Cascade;
import org.hibernate.annotations.CascadeType;
@Entity
@Table(name = "Teacher")
public class Teacher implements Serializable{
    private Integer id;
    private String teacherName;
    private Set<Student> student;

    @Id
    @GeneratedValue(strategy=GenerationType.SEQUENCE,generator="generator")
    @SequenceGenerator(sequenceName="Teacher_SEQ",
        name="generator",initialValue=1,allocationSize=1)
    public Integer getId() {
        return id;
    }
    public void setId(Integer id) {
        this.id = id;
    }

    @Column(name = "studentName", length = 30)
    public String getTeacherName() {
        return teacherName;
    }
    public void setTeacherName(String teacherName) {
        this.teacherName = teacherName;
    }

    @ManyToMany
    @JoinTable(name="student_teacher",
            joinColumns= {@JoinColumn(name="teacher_id")},
            inverseJoinColumns= {@JoinColumn(name="student_id")})
    @Cascade(CascadeType.SAVE_UPDATE)
    public Set<Student> getStudent() {
        return student;
    }
    public void setStudent(Set<Student> student) {
        this.student = student;
    }
    @Override
    public String toString() {
        return "Teacher [id=" + id + ", teacherName=" + teacherName + "]";
    }

}
```

8.Test.java 测试

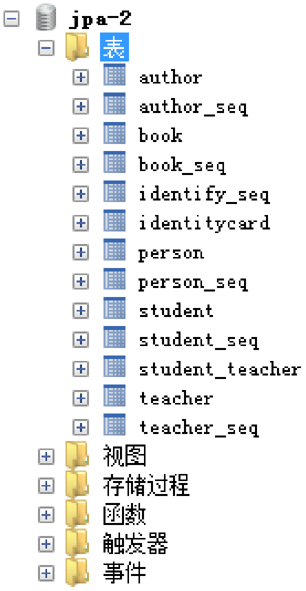
```
package domain;
import java.awt.List;
import javax.persistence.EntityManager;
import javax.persistence.EntityManagerFactory;
import javax.persistence.EntityTransaction;
import javax.persistence.Persistence;
import javax.persistence.PersistenceContext;
import javax.persistence.Query;
public class Test {
    @PersistenceContext
    EntityManager em;
    public static void main(String[] args) {
        // 1. 创建EntityManagerFactory
        EntityManagerFactory factory =  Persistence.createEntityManagerFactory("JPA-1");
        // 2. 创建EntityManager
        EntityManager entityManager =  factory.createEntityManager();
        // 3.开启事务
        EntityTransaction transaction =  entityManager.getTransaction();
        transaction.begin();
        // 4. 持久化操作
        add(entityManager);
        select(entityManager);
        query(entityManager);
        query1(entityManager);
        query2(entityManager);
        update(entityManager);
        // 5. 提交事务
        transaction.commit();
        // 6. 关闭EntityManager
        entityManager.close();
        // 7. 关闭EntityManagerFactory
        factory.close();
    }
    public static void add(EntityManager  entityManager) {
        Author author = new Author();
        author.setId(123);
        author.setAuthorName("旺旺");
        Book book = new Book();
        book.setBookName("时光");
        book.setPrice((float) 12.44);
        book.setId(1);
        List booklist = new List();
        entityManager.persist(author);
        entityManager.persist(book);
    }
    public static void select(EntityManager  entityManager) {
        List author = (List)  entityManager.createQuery("select b from Book  b").getResultList();
        System.out.println(author);
    }
    public static void query(EntityManager  entityManager) {
        List count = (List)  entityManager.createQuery("select count(b) from  Book b").getResultList();
        System.out.println(count);
    }
    public static void query1(EntityManager  entityManager) {
        List query = (List)  entityManager.createQuery("select p from Person  p where p.age=?1 and p.Name=?2");
        ((Query) query).setParameter(1, 21);
        ((Query) query).setParameter(2, "Jack");
    }
    public static void query2(EntityManager  entityManager) {
        Query query =  entityManager.createQuery("select p from Person  p where p.age=:age and p.Name=:name");
        query.setParameter("age", 21);
        query.setParameter("name", "Jack");
    }

    public static void update(EntityManager  entityManager) {
        entityManager.getTransaction().begin();
        Query query =  entityManager.createQuery("update Person p set  p.Name=:name where p.id=:id");
        query.setParameter("name", "xiaobai");
        query.setParameter("id", 2);
        query.executeUpdate();
        Query query1 =  entityManager.createQuery("delete Person p where  p.id=:id");
        query1.setParameter("id", 9);
        query1.executeUpdate();
        entityManager.getTransaction().commit();
    }
}
```

9.配置文件

```
<?xml version="1.0" encoding="UTF-8"?>
<persistence version="2.0"
    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/persistencehttp://java.sun.com/xml/ns/persistence/persistence_2_0.xsd">
    <persistence-unit name="JPA-1"
        transaction-type="RESOURCE_LOCAL">
        <provider>org.hibernate.ejb.HibernatePersistence</provider>
        <class>domain.Author</class>
        <class>domain.Book</class>
        <class>domain.IdentityCard</class>
        <class>domain.Person</class>
        <class>domain.Student</class>
        <class>domain.Teacher</class>
        <properties>
            <property  name="javax.persistence.jdbc.url"
                value="jdbc:mysql://localhost:3306/JPA-2" />
            <property  name="javax.persistence.jdbc.user" value="root"  />
            <property  name="javax.persistence.jdbc.password"
                value="root" />
            <property  name="javax.persistence.jdbc.driver"
                value="com.mysql.jdbc.Driver" />
            <property  name="eclipselink.logging.level" value="FINE" />
            <property  name="eclipselink.ddl-generation"
                value="create-tables" />
            <!-- 配置JPA实现产品的属性，即hibernate的属性 -->
            <property  name="hibernate.format_sql" value="true" /><!--  是否格式化sql语句 -->
            <property name="hibernate.show_sql"  value="true" /> <!-- 是否在控制台打印sql语句 -->
            <property  name="hibernate.hbm2ddl.auto" value="update" />
        </properties>
    </persistence-unit>
</persistence>
```

10.数据库表生成结果



```
⊟ jpa-2
  ⊟ 表
    ⊞ author
    ⊞ author_seq
    ⊞ book
    ⊞ book_seq
    ⊞ identify_seq
    ⊞ identitycard
    ⊞ person
    ⊞ person_seq
    ⊞ student
    ⊞ student_seq
    ⊞ student_teacher
    ⊞ teacher
    ⊞ teacher_seq
  ⊞ 视图
  ⊞ 存储过程
  ⊞ 函数
  ⊞ 触发器
  ⊞ 事件
```