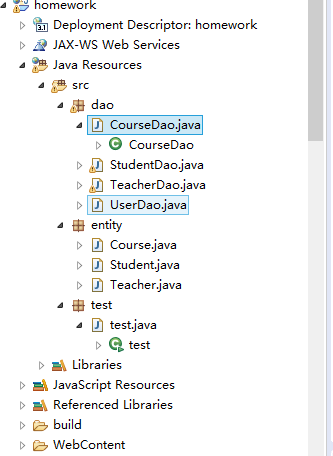
# 实验二：ORM设计模式和DAO模式(选做)

实验目的：设计一个小型框架，封装数据库访问的基础操作，封装数据库的sql语句的自动组装。

# 项目建立

说明：在实验二建立的项目基础上根据情况添加合适的包。



# 类的设计

****

# 类的实现

将编写的实体类代码复制到下面的代码框中。

**一 实体类**

**package** entity;

**public** **class** Course {

**private** String cid;

**private** String title;

**private** **int** credit;

**private** String type;

**public** **void** setCid(String cid) {

**this**.cid = cid;

}

**public** **void** setTitle(String title) {

**this**.title = title;

}

**public** **void** setType(String type) {

**this**.type = type;

}

**public** **void** setCredit(**int** credit) {

**this**.credit = credit;

}

**public** String getCid() {

**return** cid;

}

**public** String getTitle() {

**return** title;

}

**public** **int** getCredit() {

**return** credit;

}

**public** String getType() {

**return** type;

}

}

**package** entity;

**public** **class** Student {

**private** String sid;

**private** String sname;

**private** String sex;

**private** **int** classes;

**private** String major;

**public** **void** setSid(String sid) {

**this**.sid = sid;

}

**public** **void** setSname(String sname) {

**this**.sname = sname;

}

**public** **void** setSex(String sex) {

**this**.sex = sex;

}

**public** **void** setClasses(**int** class1) {

classes = class1;

}

**public** **void** setMajor(String major) {

**this**.major = major;

}

**public** String getSid() {

**return** sid;

}

**public** String getSname() {

**return** sname;

}

**public** **int** getClasses() {

**return** classes;

}

**public** String getSex() {

**return** sex;

}

**public** String getMajor() {

**return** major;

}

}

**package** entity;

**public** **class** Teacher {

**private** String tid;

**private** String tname;

**private** String department;

**private** String sex;

**private** String phone;

**public** **void** setTid(String tid) {

**this**.tid = tid;

}

**public** **void** setTname(String tname) {

**this**.tname = tname;

}

**public** **void** setDepartment(String department) {

**this**.department = department;

}

**public** **void** setSex(String sex) {

**this**.sex = sex;

}

**public** **void** setPhone(String phone) {

**this**.phone = phone;

}

**public** String getTid() {

**return** tid;

}

**public** String getTname() {

**return** tname;

}

**public** String getSex() {

**return** sex;

}

**public** String getDepartment() {

**return** department;

}

**public** String getPhone() {

**return** phone;

}

}

**二 dao类**

**package** dao;

**import** java.sql.Connection;

**import** java.sql.DriverManager;

**import** java.sql.PreparedStatement;

**import** java.sql.ResultSet;

**import** java.sql.SQLException;

**import** java.util.ArrayList;

**import** java.util.List;

**import** entity.Course;

**public** **class** CourseDao {

**static** **final** String ***JDBC\_DRIVER*** = "com.mysql.jdbc.Driver";

**static** **final** String ***DB\_URL*** = "jdbc:mysql://localhost:3306/sql\_system?characterEncoding=utf-8";

**static** **final** String ***USER*** = "root";

**static** **final** String ***PASS*** = "";

Connection conn = **null**;

PreparedStatement pstmt = **null**;

ResultSet rs = **null**;

**public** List<Course> getCourses(){

**try**{

List<Course> courses = **new** ArrayList<>();

Class.*forName*("com.mysql.jdbc.Driver");

conn = DriverManager.*getConnection*(***DB\_URL***,***USER***,***PASS***);

String sql;

sql = "select \* from Course ";

pstmt = conn.prepareStatement(sql);

rs = pstmt.executeQuery();

**while**(rs.next()) {

Course course = **new** Course();

course.setCid(rs.getString("cid"));

course.setTitle(rs.getString("title"));

course.setType(rs.getString("type"));

course.setCredit(rs.getInt("credit"));

courses.add(course);

}

**return** courses;

}**catch**(Exception e) {

//

e.printStackTrace();

}**finally**{

//

**try**{

**if**(pstmt!=**null**)

pstmt.close();

}**catch**(SQLException se2){

}

**try**{

**if**(conn!=**null**)

conn.close();

}**catch**(SQLException se){

se.printStackTrace();

}

}

**return** **null**;

}

**public** **void** delete\_course(String cid) {

**try**{

Class.*forName*("com.mysql.jdbc.Driver");

conn = DriverManager.*getConnection*(***DB\_URL***,***USER***,***PASS***);

String sql;

sql = "delete from Course where cid = ?";

pstmt = conn.prepareStatement(sql);

pstmt.setString(1,cid);

pstmt.executeUpdate();

System.***out***.println("删除成功");

}**catch**(Exception e) {

//

e.printStackTrace();

System.***out***.println("删除失败");

}**finally**{

//

**try**{

**if**(pstmt!=**null**)

pstmt.close();

}**catch**(SQLException se2){

}

**try**{

**if**(conn!=**null**)

conn.close();

}**catch**(SQLException se){

se.printStackTrace();

}

}

}

**public** **void** insert\_course(Course course) {

**try**{

Class.*forName*("com.mysql.jdbc.Driver");

conn = DriverManager.*getConnection*(***DB\_URL***,***USER***,***PASS***);

String sql;

sql = "insert into Course values(?,?,?,?)";

pstmt = conn.prepareStatement(sql);

pstmt.setString(1,course.getCid());

pstmt.setString(2,course.getTitle());

pstmt.setInt(3,course.getCredit());

pstmt.setString(4,course.getType());

pstmt.executeUpdate();

System.***out***.println("添加成功");

}**catch**(Exception e) {

e.printStackTrace();

System.***out***.println("添加失败");

}**finally**{

//

**try**{

**if**(pstmt!=**null**)

pstmt.close();

}**catch**(SQLException se2){

}

**try**{

**if**(conn!=**null**)

conn.close();

}**catch**(SQLException se){

}

}

}

**public** Course getCourse(String cid) {

**try**{

Class.*forName*("com.mysql.jdbc.Driver");

conn = DriverManager.*getConnection*(***DB\_URL***,***USER***,***PASS***);

String sql;

sql = "select \* from Course where cid = ?";

pstmt = conn.prepareStatement(sql);

pstmt.setString(1,cid);

rs = pstmt.executeQuery();

**if**(rs.next()) {

Course course = **new** Course();

course.setCid(rs.getString("cid"));

course.setTitle(rs.getString("title"));

course.setType(rs.getString("type"));

course.setCredit(rs.getInt("credit"));

**return** course;

}

**else** **return** **null**;

}**catch**(Exception e) {

//

e.printStackTrace();

}**finally**{

//

**try**{

**if**(pstmt!=**null**)

pstmt.close();

}**catch**(SQLException se2){

}

**try**{

**if**(conn!=**null**)

conn.close();

}**catch**(SQLException se){

se.printStackTrace();

}

}

**return** **null**;

}

**public** **void** Mupdate\_course(Course course) {

**try**{

Class.*forName*("com.mysql.jdbc.Driver");

conn = DriverManager.*getConnection*(***DB\_URL***,***USER***,***PASS***);

String sql = "update Course set title = ? ,type = ?,credit = ? where cid = ?" ;

pstmt = conn.prepareStatement(sql);

pstmt.setString(1,course.getTitle());

pstmt.setString(2,course.getType());

pstmt.setInt(3,course.getCredit());

pstmt.setString(4,course.getCid());

pstmt.executeUpdate();

pstmt.close();

System.***out***.println("修改成功");

} **catch**(SQLException se) {

System.***out***.println("修改失败");

//

} **catch**(Exception e) {

System.***out***.println("修改失败");

}**finally**{

//

**try**{

**if**(pstmt!=**null**)

pstmt.close();

}**catch**(SQLException se2){

}

**try**{

**if**(conn!=**null**)

conn.close();

}**catch**(SQLException se){

}

}

}

}

**package dao;**

**import java.sql.Connection;**

**import java.sql.DriverManager;**

**import java.sql.PreparedStatement;**

**import java.sql.ResultSet;**

**import java.sql.SQLException;**

**import java.util.ArrayList;**

**import java.util.List;**

**import entity.Student;**

**public class StudentDao {**

**private static final long serialVersionUID = 1L;**

**static final String JDBC\_DRIVER = "com.mysql.jdbc.Driver";**

**static final String DB\_URL = "jdbc:mysql://localhost:3306/sql\_system?characterEncoding=utf-8";**

**static final String USER = "root";**

**static final String PASS = "";**

**Connection conn = null;**

**PreparedStatement pstmt = null;**

**ResultSet rs = null;**

**public Student getStudent(String id) {//查看某个学生**

**try{**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql;**

**sql = "select \* from student where sid = ?" ;**

**pstmt = conn.prepareStatement(sql);**

**pstmt.setString(1,id);**

**rs = pstmt.executeQuery();**

**if(rs.next()) {**

**Student student= new Student();**

**student.setSid(rs.getString("sid"));**

**student.setSname(rs.getString("sname"));**

**student.setSex(rs.getString("sex"));**

**student.setMajor(rs.getString("major"));**

**student.setClasses(rs.getInt("class"));**

**return student;**

**}**

**else {**

**return null;**

**}**

**}catch(Exception e) {**

**//**

**e.printStackTrace();**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**se.printStackTrace();**

**}**

**}**

**return null;**

**}**

**public List<Student> getM\_students1(){//查看所有学生**

**try{**

**List<Student> students = new ArrayList<>();**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql;**

**sql = "select \* from Student" ;**

**pstmt = conn.prepareStatement(sql);**

**rs = pstmt.executeQuery();**

**while(rs.next()) {**

**Student student = new Student();**

**student.setSid(rs.getString("sid"));**

**student.setSname(rs.getString("sname"));**

**student.setSex(rs.getString("sex"));**

**student.setClasses(rs.getInt("class"));**

**student.setMajor(rs.getString("major"));**

**students.add(student);**

**}**

**return students;**

**}catch(Exception e) {**

**//**

**e.printStackTrace();**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**se.printStackTrace();**

**}**

**}**

**return null;**

**}**

**public void delete\_student(String sid) {**

**System.out.println("11111");**

**System.out.println("11111");**

**try{**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql;**

**sql = "delete from Student where sid = ?";**

**pstmt = conn.prepareStatement(sql);**

**pstmt.setString(1,sid);**

**pstmt.executeUpdate();**

**System.out.println("删除成功");**

**}catch(Exception e) {**

**//**

**e.printStackTrace();**

**System.out.println("删除异常");**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**se.printStackTrace();**

**}**

**}**

**}**

**public void insert\_student(Student student) {**

**try{**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql;**

**sql = "insert into Student values(?,?,?,?,?)";**

**pstmt = conn.prepareStatement(sql);**

**pstmt.setString(1,student.getSid());**

**pstmt.setString(2,student.getSname());**

**pstmt.setString(3,student.getSex());**

**pstmt.setInt(4,student.getClasses());**

**pstmt.setString(5,student.getMajor());**

**pstmt.executeUpdate();**

**System.out.println("插入成功");**

**}catch(Exception e) {**

**e.printStackTrace();**

**System.out.println("插入失败");**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**}**

**}**

**}**

**public void update\_student(Student student) {**

**try{**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql = "update Student set sname = ? ,sex = ?,class = ?,major=? where sid= ? " ;**

**System.out.println(sql);**

**pstmt = conn.prepareStatement(sql);**

**pstmt.setString(1,student.getSname());**

**pstmt.setString(2,student.getSex());**

**pstmt.setInt(3,student.getClasses());**

**pstmt.setString(4,student.getMajor());**

**pstmt.setString(5,student.getSid());**

**pstmt.executeUpdate();**

**pstmt.close();**

**System.out.println("修改成功");**

**} catch(SQLException se) {**

**System.out.println("修改失败");**

**//**

**} catch(Exception e) {**

**//**

**e.printStackTrace();**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**se.printStackTrace();**

**}**

**}**

**}**

**}**

**package dao;**

**import java.sql.Connection;**

**import java.sql.DriverManager;**

**import java.sql.PreparedStatement;**

**import java.sql.ResultSet;**

**import java.sql.SQLException;**

**import java.util.ArrayList;**

**import java.util.List;**

**import entity.Teacher;**

**public class TeacherDao {**

**private static final long serialVersionUID = 1L;**

**static final String JDBC\_DRIVER = "com.mysql.jdbc.Driver";**

**static final String DB\_URL = "jdbc:mysql://localhost:3306/sql\_system?characterEncoding=utf-8";**

**static final String USER = "root";**

**static final String PASS = "";**

**Connection conn = null;**

**PreparedStatement pstmt = null;**

**ResultSet rs = null;**

**public List<Teacher> getM\_teachers1(){**

**try{**

**List<Teacher> teachers = new ArrayList<>();**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql;**

**sql = "select \* from Teacher" ;**

**pstmt = conn.prepareStatement(sql);**

**rs = pstmt.executeQuery();**

**while(rs.next()) {**

**Teacher teacher = new Teacher();**

**teacher.setTid(rs.getString("tid"));**

**teacher.setTname(rs.getString("tname"));**

**teacher.setSex(rs.getString("sex"));**

**teacher.setDepartment(rs.getString("department"));**

**teacher.setPhone(rs.getString("phone"));**

**teachers.add(teacher);**

**}**

**return teachers;**

**}catch(Exception e) {**

**//**

**e.printStackTrace();**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**se.printStackTrace();**

**}**

**}**

**return null;**

**}**

**public void delete\_teacher(String tid) {**

**try{**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql;**

**sql = "delete from Teacher where tid = ?";**

**pstmt = conn.prepareStatement(sql);**

**pstmt.setString(1,tid);**

**pstmt.executeUpdate();**

**System.out.println("删除成功");**

**}catch(Exception e) {**

**//**

**e.printStackTrace();**

**System.out.println("删除异常");**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**se.printStackTrace();**

**}**

**}**

**}**

**public void update\_teacher(Teacher teacher) {**

**try{**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql = "update Teacher set tname = ? ,sex = ?,department = ?,phone=? where tid= ? " ;**

**pstmt = conn.prepareStatement(sql);**

**pstmt.setString(1,teacher.getTname());**

**pstmt.setString(2,teacher.getSex());**

**pstmt.setString(3,teacher.getDepartment());**

**pstmt.setString(4,teacher.getPhone());**

**pstmt.setString(5,teacher.getTid());**

**pstmt.executeUpdate();**

**pstmt.close();**

**System.out.println("修改成功");**

**} catch(SQLException se) {**

**System.out.println("修改失败");**

**//**

**} catch(Exception e) {**

**//**

**e.printStackTrace();**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**se.printStackTrace();**

**}**

**}**

**}**

**public void insert\_teacher(Teacher teacher) {**

**try{**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql;**

**sql = "insert into Teacher values(?,?,?,?,?)";**

**pstmt = conn.prepareStatement(sql);**

**pstmt.setString(1,teacher.getTid());**

**pstmt.setString(2,teacher.getTname());**

**pstmt.setString(3,teacher.getDepartment());**

**pstmt.setString(4,teacher.getSex());**

**pstmt.setString(5,teacher.getPhone());**

**pstmt.executeUpdate();**

**System.out.println("插入成功");**

**}catch(Exception e) {**

**e.printStackTrace();**

**System.out.println("插入失败");**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**}**

**}**

**}**

**public Teacher getTeacher(String id) {**

**try{**

**Class.forName("com.mysql.jdbc.Driver");**

**conn = DriverManager.getConnection(DB\_URL,USER,PASS);**

**String sql;**

**sql = "select \* from teacher where tid = ?" ;**

**pstmt = conn.prepareStatement(sql);**

**pstmt.setString(1,id);**

**rs = pstmt.executeQuery();**

**if(rs.next()) {**

**Teacher teacher= new Teacher();**

**teacher.setTid(rs.getString("tid"));**

**teacher.setTname(rs.getString("tname"));**

**teacher.setSex(rs.getString("sex"));**

**teacher.setDepartment(rs.getString("department"));**

**teacher.setPhone(rs.getString("phone"));**

**return teacher;**

**}**

**else {**

**return null;**

**}**

**}catch(Exception e) {**

**//**

**e.printStackTrace();**

**}finally{**

**//**

**try{**

**if(pstmt!=null)**

**pstmt.close();**

**}catch(SQLException se2){**

**}**

**try{**

**if(conn!=null)**

**conn.close();**

**}catch(SQLException se){**

**se.printStackTrace();**

**}**

**}**

**return null;**

**}**

**}**

**三 测试类**

**package** test;

**import** java.util.List;

**import** dao.\*;

**import** entity.\*;

**public** **class** test {

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

CourseDao cdao = **new** CourseDao();

StudentDao sdao = **new** StudentDao();

TeacherDao tdao = **new** TeacherDao();

List<Course> courses = cdao.getCourses();

List<Student> students = sdao.getM\_students1();

List<Teacher> teachers = tdao.getM\_teachers1();

**for**(**int** i = 0; i < courses.size();i++) {

Course course = courses.get(i);

System.***out***.println("代号:" +course.getCid());

System.***out***.println("名称:" + course.getTitle());

}

**for**(**int** i = 0; i < students.size();i++) {

Student student = students.get(i);

System.***out***.println("学号:" +student.getSid());

System.***out***.println("姓名:" + student.getSname());

}

**for**(**int** i = 0; i < teachers.size();i++) {

Teacher teacher = teachers.get(i);

System.***out***.println("工号:" +teacher.getTid());

System.***out***.println("姓名:" + teacher.getTname());

}

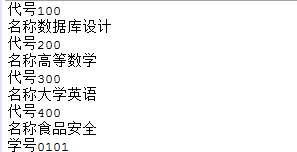
}

}

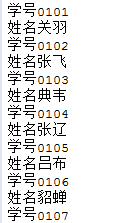
# 运行效果

截屏展示运行的效果，注意适当的说明和图的编号

（1）通过coursedao.list()获取课程信息



1. 通过studentdao.list()获取学生信息



1. 通过teacherdao.list()获取老师信息

