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| **学生学号** |  | **实验课成绩** |  |



**学 生 实 验 报 告 书**

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| **实验课程名称** | Java语言程序设计D |
| **开 课 学 院** | 计算机科学与技术学院 |
| **指导教师姓名** |  |
| **学 生 姓 名** |  |
| **学生专业班级** |  |

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| 2021 | —— | 2022 | 学年 | 第 | 一 | 学期 |

课程名称：Java语言程序设计D

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| 实验项目名称 | 实验 1：定义自己的类 | | | 实验成绩 |  |
| 实验者 |  | 专业班级 |  | 实验日期 | 2021年10月14日 |
| 1. 实验分析与设计（可加页）    1. 实验内容描述（问题描述）   1、编写一个应用程序计算梯形和圆形的面积。 提示：在程序中可定义2个类来分别描述梯形、圆形的属性和求面积的方法，然后通过 定义主类，使用梯形类和圆形类创建对象，计算它们的面积。  2、编写一个控制台程序 TicketCmd，调用 TicketMachine 类实现自动售票机的完整交互，功能需求见课件。   * 1. 实验基本原理与设计（包括实验方案设计，实验手段的确定，实验步骤等，用硬件逻辑或者算法描述）   1.  Trapezoid.java:  package homework1;  public class Trapezoid {  private double upperBound,lowerBound;  private double height;  Trapezoid(double upperBound,double lowerBound,double height){  this.upperBound = upperBound;  this.lowerBound = lowerBound;  this.height = height;  }    void setUpperBound(double upperBound){this.upperBound = upperBound;}  void setLowerBound(double lowerBound){this.lowerBound = lowerBound;}  void setHeight(double height){this.height = height;}  double getArea(){  return isLegal() ? (upperBound + lowerBound) \* height / 2 : -1;  }  boolean isLegal(){  if(upperBound <= 0 || lowerBound <= 0 || height <= 0) return false;  return true;  }  }  Triang.java:  package homework1;  public class Triangle {  private double edge1,edge2,edge3;  Triangle(double edge1,double edge2,double edge3){  this.edge1 = edge1;  this.edge2 = edge2;  this.edge3 = edge3;  }  public void setEdge1(double edge){edge1 = edge;}  public void setEdge2(double edge){edge2 = edge;}  public void setEdge3(double edge){edge3 = edge;}  public double getArea(){  double temp = (edge1 + edge2 + edge3)  \* (edge1 + edge2 - edge3)  \* (edge1 + edge3 - edge2)  \* (edge2 + edge3 - edge1);  return isLegal() ? 1.0 / 4 \* Math.sqrt(temp) : -1;  }  boolean isLegal(){  if(edge1 <= 0 || edge2 <= 0 || edge3 <= 0) return false;  if(edge1 + edge2 < edge3) return false;  if(edge1 + edge3 < edge2) return false;  if(edge2 + edge3 < edge1) return false;  return true;  }  }  Test.java:  package homework1;  final public class Test {  public static void main(String[] args) {  Trapezoid trapezoid = new Trapezoid(2, 3, 0);  System.out.println(trapezoid.getArea());  trapezoid.setHeight(8);  System.out.println(trapezoid.getArea());  Triangle triangle = new Triangle(3, 4, 8);  System.out.println(triangle.getArea());  triangle.setEdge3(5);  System.out.println(triangle.getArea());  }  }  2.  MoneyService.java:  package homework2;  public interface MoneyService {  default boolean isLegal(double input){  if(input <= 0.01) return false;  return true;  }  public boolean input(double input);  boolean output(double output);  }  TicketService.java:  package homework2;  public interface TicketService {  static final String SPLIT\_LINE = "==========";  static final String PRINT\_TICKET = "this is a ticket\nprice: 2 Yuan";  static final String RETURN\_MONEY = "请收好找零 ";  void inputMoney(double money);  default void printTicket(){  System.out.println(SPLIT\_LINE);  System.out.println(PRINT\_TICKET);  System.out.println(SPLIT\_LINE);  }  void returnMoney();  }  TicketMachine.java:  package homework2;  public class TicketMachine implements TicketService{  private static final String SHOW\_MONEY = "当前余额：";  private static final String TAIL = "元";  private static final String ERROR\_MSG = "非法操作";  private double money = 0;  private IOcontrol iOcontrol = new IOcontrol();  @Override  public void inputMoney(double money) {  if(iOcontrol.input(money)){  showMoney();  }else{  System.out.println(ERROR\_MSG);  }  }  @Override  public void printTicket() {  if(!iOcontrol.output(2)){  System.out.println(ERROR\_MSG);  }else{  TicketService.super.printTicket();  }  showMoney();  }  @Override  public void returnMoney() {  System.out.println(TicketService.RETURN\_MONEY + money + TAIL);  money = 0;  }  private void showMoney() {  System.out.println(SHOW\_MONEY + money + TAIL);  }  private class IOcontrol implements MoneyService{  @Override  public boolean input(double input) {  if(!isLegal(input)) return false;  money += input;  return true;  }  @Override  public boolean output(double output) {  if(!isLegal(output) || output > money) return false;  money -= output;  return true;  }  }  }  Test.java:  package homework2;  import java.util.Scanner;  final public class Test {  private static final String WELCOME\_MSG = "======欢迎使用自动售票机======\n本机销售固定票价2元的车票";  private static final String SERVICE\_MSG = "请选择服务：\n1.投币\n2.打印车票\n3.找零";  private static final String ERROR\_MSG = "非法输入";  public static void main(String[] args) {  TicketMachine ticketMachine = new TicketMachine();  Scanner scanner = new Scanner(System.in);  while(true){  System.out.println(WELCOME\_MSG);  while(true){  System.out.println(SERVICE\_MSG);  if(scanner.hasNextInt()){  int select = scanner.nextInt();  switch (select) {  case 1:  double money = scanner.nextDouble();  ticketMachine.inputMoney(money);  break;  case 2:  ticketMachine.printTicket();  break;  case 3:  ticketMachine.returnMoney();  break;  default:  System.out.println(ERROR\_MSG);  break;  }  if(select == 3) break;  }else{  scanner = new Scanner(System.in);  System.out.println(ERROR\_MSG);  }  }  }  }  }   * 1. 主要仪器设备及耗材   电脑 | | | | | |

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| 1. 实验调试与结果分析（可加页）    1. 调试过程（包括调试方法描述、实验数据记录、实验现象记录，实验过程发现的问题等）   进行正常的程序编写，过程一切正常。   * 1. 实验结果及分析（包括结果描述、实验现象分析、影响因素讨论、综合分析和结论等）          * 1. 实验小结、建议及体会   在类的内部构建私有类继承接口可以隐藏接口方法。  当Scanner要清空缓冲区时需要重新new一个Scanner。 |