

# 2022秋Java程序设计实验

## 现实世界的接口

### 实验代码

- 主测试函数

```
public class Main {
    static Car car = new Car();
    static GasCooker gasCooker = new GasCooker();
    public static void testBattery(){
        System.out.println("正在测试汽车与燃气灶换电池...");
        car.replaceBattery(new DryBattery());
        car.replaceBattery(new storageBattery());
        gasCooker.replaceBattery(new DryBattery());
        gasCooker.replaceBattery(new storageBattery());
    }
    public static void testPipe(){
        System.out.println("正在测试燃气灶连接气源管道...");
        Pipe guan1 = new Pipe("天然气",4);
        Pipe guan2 = new Pipe("天然气",6);
        Pipe guan3 = new Pipe("液化气",4);
        Pipe guan4 = new Pipe("液化气",6);
        gasCooker.connectPipe(guan1);
        gasCooker.connectPipe(guan2);
        gasCooker.connectPipe(guan3);
        gasCooker.connectPipe(guan4);
    }
    public static void testOil(){
        System.out.println("正在测试汽车加油...");
        String gasoline = "汽油";
        String diesel = "柴油";
        car.refuel(gasoline);
        car.refuel(diesel);
    }
    public static void main(String args[]){
        testOil();
        testPipe();
        testBattery();
    }
}
```

- 三个接口

```
public interface BatteryBox {  
    void replaceBattery(Battery battery);  
}
```

```
public interface OilTank {  
    void refuel(String a);  
}
```

```
public interface PipeJoint {  
    String flow = "天然气";  
    int diameter = 4;  
    void connectPipe(Pipe guan);  
}
```

- 汽车和燃气灶类

```

public class Car implements BatteryBox,OilTank{
    public void refuel(String a){
        if(a.equals("汽油")){
            System.out.println("加油中...");
        }
        else System.out.println("不能加柴油");
    }

    @Override
    public void replaceBattery(Battery battery) {
        if(battery instanceof storageBattery){
            System.out.println("电池匹配, 装载成功");
        }
        else System.out.println("电池型号不对! ");
    }
    public void drive(){

    }
    public void stop(){

    }
    public void reverse(){

    }
}

public class GasCooker implements PipeJoint,BatteryBox{
    @Override
    public void replaceBattery(Battery battery) {
        if(battery instanceof DryBattery){
            System.out.println("电池匹配, 装载成功! ");
        }
        else System.out.println("电池型号不对");
    }

    @Override
    public void connectPipe(Pipe guan) {
        if(guan.diameter==4 && guan.flow.equals("天然气")){
            System.out.println("燃气接头已连接气源管道");
        }
        if(guan.diameter==6&&guan.flow.equals("天然气")){
            System.out.println("燃气管直径不一致");
        }
        if(guan.diameter==6&&guan.flow.equals("液化气")){
            System.out.println("燃气类型与管道均不一致");
        }
        if(guan.diameter==4&&guan.flow.equals("液化气")){
            System.out.println("燃气类型不符合");
        }
    }
}

```

```
void ignite(){}  
void showdown(){}  
void moreHot(){}  
void lessHot(){}  
}
```

- 电池类

```
public class Battery{  
  
}  
  
public class DryBattery extends Battery{  
  
}  
  
public class storageBattery extends Battery{  
  
}
```

- 管道类

```
public class Pipe {  
    String flow;  
    int diameter;  
    Pipe(String flow,int diameter){  
        this.flow = flow;  
        this.diameter = diameter;  
    }  
}
```

- 运行结果

```
"C:\Program Files\Java\jdk-17.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.3
正在测试汽车加油...
加油中...
不能加柴油
正在测试燃气灶连接气源管道...
燃气接头已连接气源管道
燃气管直径不一致
燃气类型不符合
燃气类型与管道均不一致
正在测试汽车与燃气灶换电池...
电池型号不对!
电池匹配, 装载成功
电池匹配, 装载成功!
电池型号不对
```