

# Java作业2

## 实验1：求方程的根

### SquareEquation.java

```
package tom.jiafei;
public class SquareEquation {
    private double a, b, c;
    public SquareEquation(double a, double b, double c) {
        this.a = a;
        this.b = b;
        this.c = c;
    }
    public void solve() {
        double delta = b * b - 4 * a * c;
        if (delta < 0) {
            System.out.println("The equation has no real roots.");
        } else if (delta == 0) {
            double root = -b / (2 * a);
            System.out.println("The equation has one real root: " + root);
        } else {
            double root1 = (-b + Math.sqrt(delta)) / (2 * a);
            double root2 = (-b - Math.sqrt(delta)) / (2 * a);
            System.out.println("The equation has two real roots: " + root1 +
                " and " + root2);
        }
    }
}
```

### SunRise.java

```
import tom.jiafei.SquareEquation;
public class SunRise {
    public static void main(String[] args) {
        SquareEquation equation = new SquareEquation(1, -3, 2);
        equation.solve();
    }
}
```

## 实验2：共饮同井水

### Village.java

```

public class Village {
    protected static int waterAmount = 100; // initial water amount in the
well
    public Village() {}
    public void useWater(int amount) {
        waterAmount -= amount;
        System.out.println("Water used. Remaining water: " + waterAmount);
    }
    public static int getWaterAmount() {
        return waterAmount;
    }
}

```

## Land.java

```

public class Land {
    public static void main(String[] args) {
        Village village1 = new Village();
        Village village2 = new Village();
        village1.useWater(20);
        System.out.println("Village2 checks water: " +
Village.getWaterAmount());
    }
}

```

## 实验3：中国人、北京人和美国人

### People.java

```

public class People {
    protected double height;
    protected double weight;
    public People() {}
    public void speakHello() {
        System.out.println("Hello!");
    }
    public void averageHeight() {
        System.out.println("Average human height...");
    }
    public void averageWeight() {
        System.out.println("Average human weight...");
    }
}

```

### ChinaPeople.java

```

public class ChinaPeople extends People {
    @Override
    public void speakHello() {
        System.out.println("你好! ");
    }

    @Override
    public void averageHeight() {
        System.out.println("Average Chinese height...");
    }

    @Override
    public void averageWeight() {
        System.out.println("Average Chinese weight...");
    }

    public void chinaGongfu() {
        System.out.println("Performing Chinese Gongfu...");
    }
}

```

## AmericanPeople.java

```

public class AmericanPeople extends People {
    @Override
    public void speakHello() {
        System.out.println("Hi!");
    }

    @Override
    public void averageHeight() {
        System.out.println("Average American height...");
    }

    @Override
    public void averageWeight() {
        System.out.println("Average American weight...");
    }

    public void americanBoxing() {
        System.out.println("Doing American boxing...")
    }
}

```

## BeijingPeople.java

```

public class BeijingPeople extends ChinaPeople {
    @Override

```

```

    public void speakHello() {
        System.out.println("北京话问候！");
    }

    @Override
    public void averageHeight() {
        System.out.println("Average Beijinger height...");
    }

    @Override
    public void averageWeight() {
        System.out.println("Average Beijinger weight...");
    }

    public void beijingOpera() {
        System.out.println("Singing Beijing Opera...");
    }
}

```

## Main.java

```

public class Main {
    public static void main(String[] args) {
        ChinaPeople chinese = new ChinaPeople();
        AmericanPeople american = new AmericanPeople();
        BeijingPeople bejinger = new BeijingPeople();

        chinese.speakHello();
        american.speakHello();
        bejinger.speakHello();

        bejinger.beijingOpera();
        chinese.chinaGongfu();
        american.americanBoxing();
    }
}

```

## 实验4：公司支出的总薪水

### Employee.java

```

public abstract class Employee {
    public abstract double earnings();
}

```

### YearWorker.java

```

public class YearWorker extends Employee {
    private double annualSalary;
    public YearWorker(double annualSalary) {
        this.annualSalary = annualSalary;
    }

    @Override
    public double earnings() {
        return annualSalary;
    }
}

```

## MonthWorker.java

```

public class MonthWorker extends Employee {
    private double monthlySalary;
    public MonthWorker(double monthlySalary) {
        this.monthlySalary = monthlySalary;
    }

    @Override
    public double earnings() {
        return monthlySalary * 12;
    }
}

```

## WeekWorker.java

```

public class WeekWorker extends Employee {
    private double weeklySalary;
    public WeekWorker(double weeklySalary) {
        this.weeklySalary = weeklySalary;
    }

    @Override
    public double earnings() {
        return weeklySalary * 52;
    }
}

```

## Company.java

```

import java.util.ArrayList;
import java.util.List;
public class Company {
    private List<Employee> employees = new ArrayList<>();
    public void addEmployee(Employee employee) {

```

```
        employees.add(employee);
    }

    public double totalEarnings() {
        return employees.stream().mapToDouble(Employee::earnings).sum();
    }

    public static void main(String[] args) {
        Company company = new Company();
        company.addEmployee(new YearWorker(60000));
        company.addEmployee(new MonthWorker(5000));
        company.addEmployee(new WeekWorker(1200));
        System.out.println("Total earnings: " + company.totalEarnings());
    }
}
```