Lab 02 Assignment

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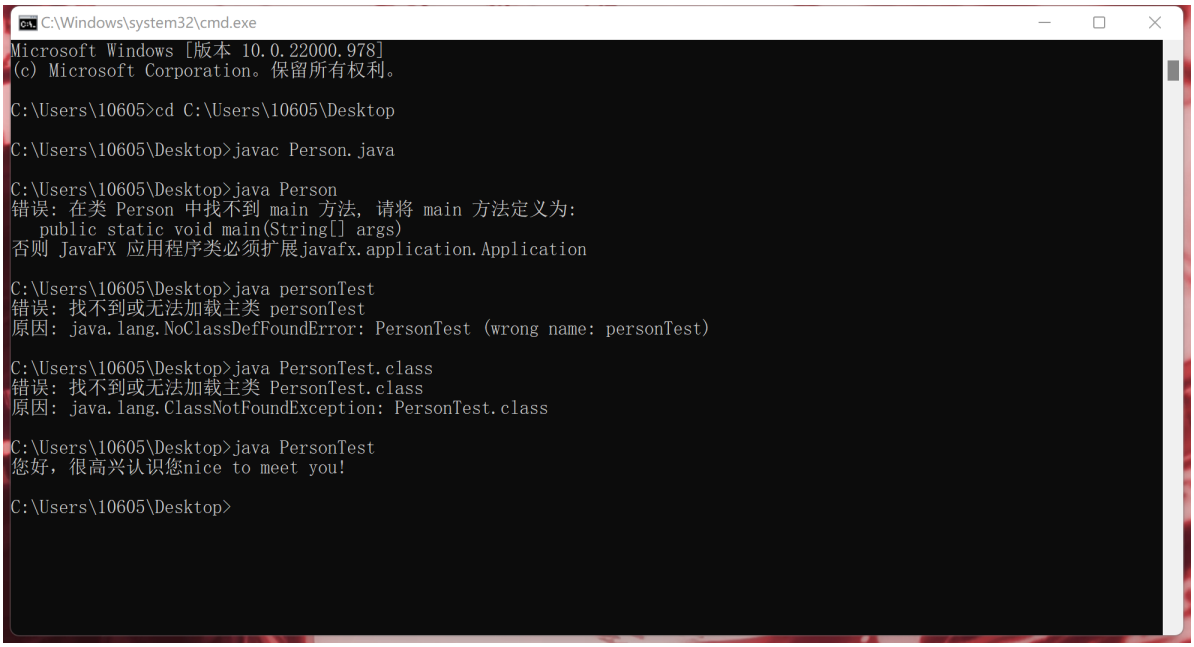
Question1

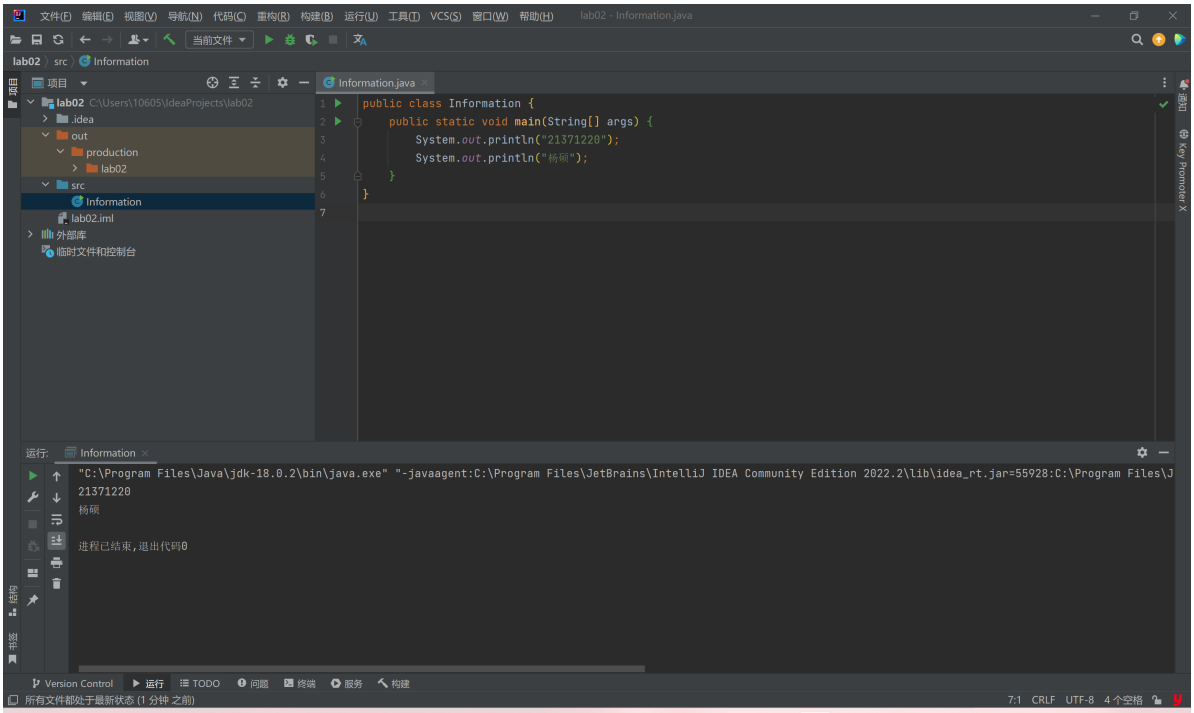
（a）源文件的名字是`Person.java`

（b）编译源文件将生成2个字节码文件，分别为`Person.class`和`PersonTest.class`

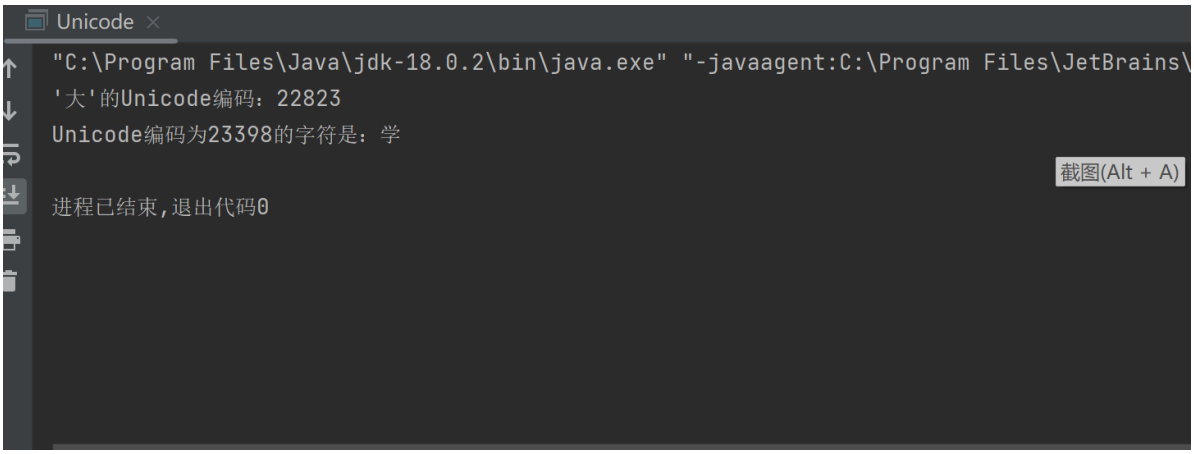
（c）在命令行分别执行`java Person`，`java persontest`,`java PersonTest.class`,`java PersonTest`，得到结果如下图



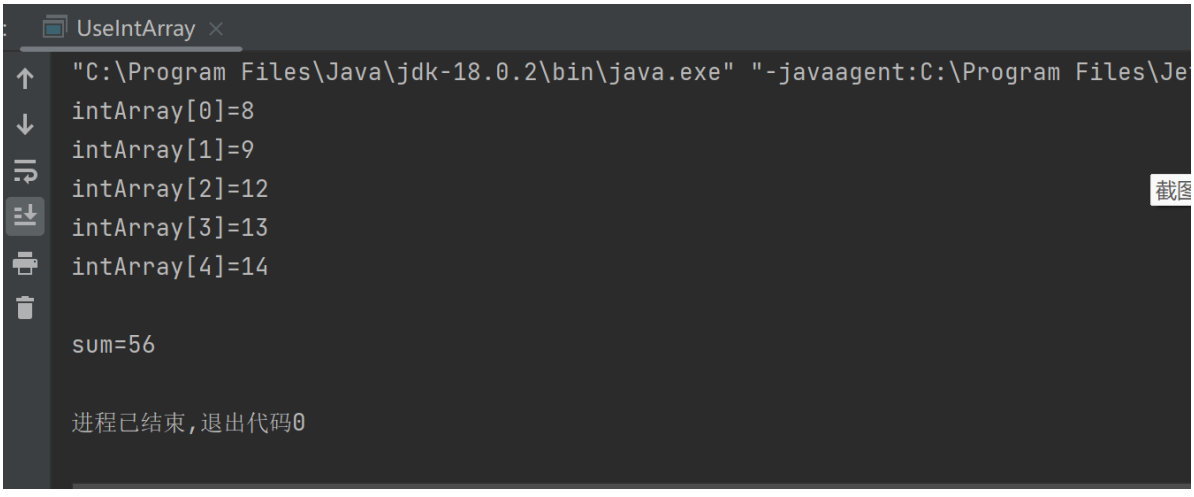
Question2



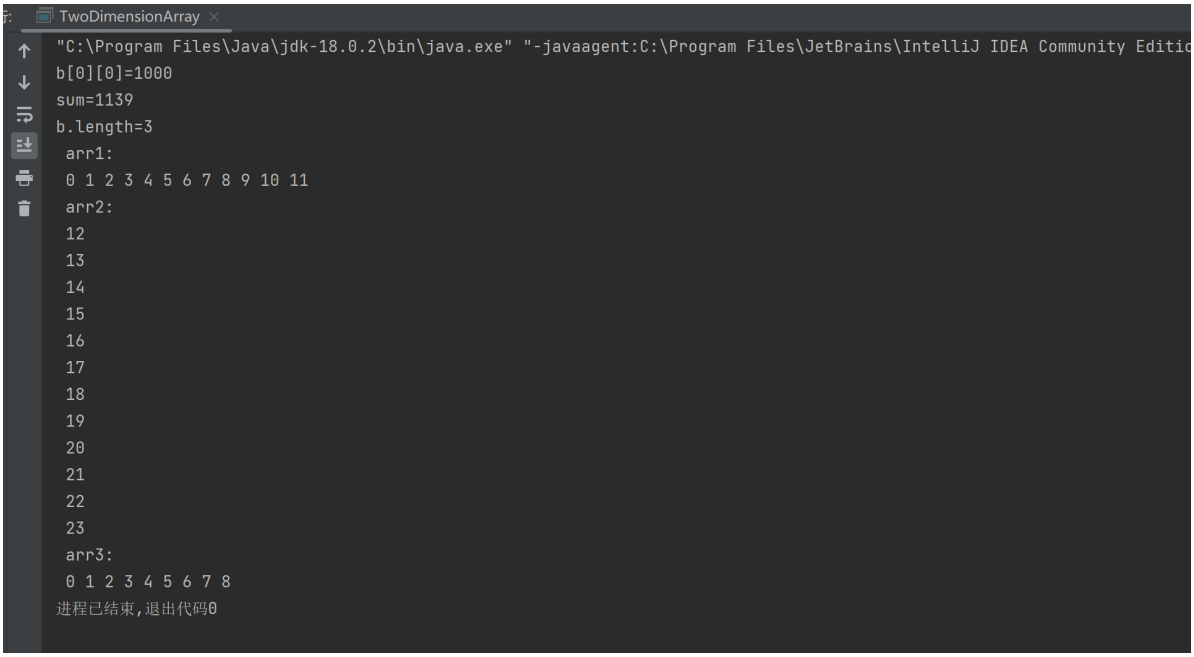
Question3



Question4



Qusetion5



Question6

程序的输出结果为：`Jeep好好`

原因是switch语法的特点：如果条件满足某个case，而该case的操作语句后未加`break;`，则从当前满足的case开始，对后面的case的操作都执行，直到`break;`或者default。可以理解为`break;`是跳出整个switch语句。

本题程序中`case 1`和`case 3`后都未加`break;`，所以执行`case 1`后又执行了`case 2`才中止，同理，执行`case 3`后又执行了`default`，因此，输出了两个e和两个好。

Question7

代码如下：

```
public class Matrix {
    public static void main(String[] args) {
        char c = args[0].charAt(0);
        int n = c - '0';
        System.out.println(args[0]);
        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= n; j++) {
               System.out.print(n * (i - 1) + j + " ");
            }
            System.out.println("");
        }
    }
}
```

输出结果：

```
"C:\Program Files\Java\jdk-18.0.2\bin\java.exe" "-javaagent:C:\Pr
5
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
21 22 23 24 25

进程已结束,退出代码0
```

```
C:\Program Files\Java\jdk-18.0.2\bin\java.exe -javaage
7
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31 32 33 34 35
36 37 38 39 40 41 42
43 44 45 46 47 48 49

进程已结束,退出代码0
```

Question8

```java
public class StarTower {
    public static void main(String[] args) {
        char c = args[0].charAt(0);
        int n = c - '0';
        for (int i = 1; i <= n; i++) {
            if (i <= (n + 1) / 2){
                for (int j = 0; j < (n + 1) / 2 - i; j++) {
                    System.out.print(' ');
                }
                for (int j = 0; j < 2 * i - 1; j++) {
                    System.out.print("*");
                }
            }
            else{
                for (int j = 0; j < i - (n + 1) / 2; j++) {
                    System.out.print(' ');
                }
                for (int j = 0; j < 2 * n - 2 * i + 1; j++) {
                    System.out.print("*");
                }
```

```
            }
            System.out.println("");
        }
    }
}
```

运行结果如下：

```
"C:\Program Files\Java\jdk-18.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetB
  *
 ***
*****
 ***
  *

进程已结束,退出代码0
```

Question9

```
public static double getPi(int n){
        if (n < 0)
            n = 0;
        double ans = 0;
        for (int i = 0; i <= n; i++) {
            if (i % 2 == 0)
                ans += 1.0 / (2.0 * i + 1);
            else if (i % 2 == 1)
                ans += -1.0 / (2.0 * i + 1);
        }
        return 4.0 * ans;
    }
```

Question10

```
public static void sort(int[] arr,int start,int end){
        if (start >= end)
            return;

        int left = start;
        int right = end;
        int key = start;
        int temp;
        while(start < end){
            while(arr[end] >= arr[key] && start < end){
                --end;
            }
            while(arr[start] <= arr[key] && start < end){
                ++start;
            }
            temp = arr[end];
            arr[end] = arr[start];
```

```
            arr[start] = temp;
        }
        temp = arr[end];
        arr[end] = arr[key];
        arr[key] = temp;
        key = end;

        sort(arr,left,key);
        sort(arr,key+1,right);
    }
public static int[] qsort(int[] arr){
        if (arr == null)
            return null;
        int n = arr.length;
        sort(arr,0,n-1);
        return arr;
    }
```

Question11

```
public class Search {
    public static void sort(int[] arr,int start,int end){
        if (start >= end)
            return;

        int left = start;
        int right = end;
        int key = start;
        int temp;
        while(start < end){
            while(arr[end] >= arr[key] && start < end){
                --end;
            }
            while(arr[start] <= arr[key] && start < end){
                ++start;
            }
            temp = arr[end];
            arr[end] = arr[start];
            arr[start] = temp;
        }
        temp = arr[end];
        arr[end] = arr[key];
        arr[key] = temp;
        key = end;

        sort(arr,left,key);
        sort(arr,key+1,right);
    }

    public static int Search(int n,int[] a){
        for (int i = 0; i < a.length; i++) {
            if (a[i] == n)
                return 1;
        }
```

```
        return 0;
    }

    public static void main(String[] args) {
        int[] a = {12,45,67,89,123,-45,67};
        sort(a,0,6);
        for (int i = 0; i < a.length; i++) {
            System.out.print(a[i] + " ");
        }
        System.out.println("");
        Scanner scanner = new Scanner(System.in);
        int n = scanner.nextInt();
        int flag;
        flag = Search(n,a);
        if (flag == 1)
            System.out.println("yes");
        else if (flag == 0)
            System.out.println("no");
    }
}
```

Question12

输出结果如下图：

```
"C:\Program Files\Java\jdk-18.0.2\bin\java.exe" "-javaagent:C:\Program F
A n   A f r i c a n   S w a l l o w
进程已结束,退出代码0
```

Question13

标注第一行：`p1的x,y坐标:1111,2222`

标注第二行：`p2的x,y坐标:-100,-200`

标注第三行：`p1的x,y坐标:0,0`

标注第四行：`p2的x,y坐标:0,0`

Question14

输出结果如下：

```
"C:\Program Files\Java\jdk-18.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ
数组a的元素个数=4
数组b的元素个数=3
数组a的引用=[I@723279cf
数组b的引用=[I@10f87f48
数组a的元素个数=3
数组b的元素个数=3
a[0]=100,a[1]=200,a[2]=300
b[0]=100,b[1]=200,b[2]=300
进程已结束,退出代码0
```

程序中a和b都是引用，开始时a,b地址不同，引用的对象不同，输出的结果自然也不同。经过 `a=b;` 这一语句，将b的引用值直接拷贝给a，也就是浅拷贝，此时a,b地址相同，代表a和b是同一个对象，因此，输出的结果相同。

Question15

```
"C:\Program Files\Java\jdk-18.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\Int
1
2
-1
-2
-3
-4
9
7
6
```

Question16

```java
public static String strscat(String... args){
        for (int i = 1; i < args.length; i++) {
            args[0] += args[i];
        }
        return args[0];
    }
```

1. 调用 `strscat(new String[]{"a", "b"})` 能通过编译
2. 如果还有静态方法 `String strscat(String[] args)` 同时存在，代码不能编译通过。传入参数是一个字符串数组，返回一个字符串
3. 如果我们声明的是 `String strscat(String[] args)`，`strscat()` 这样的调用不能通过编译

Question17

```java
//小王的信息
class Information{
    //姓名
    public static String name = "Xiao Wang";
    //初始体重
    public static int weight = 70;
}

//运动
```

```
class Exercise extends Information{
    //跑步，跳绳和呼啦圈
    public static int RunTimes = 0;
    public static int SkippingropeTimes = 0;
    public static int HulahoopTimes = 0;
    //运动次数计数
    public void Run(){
        RunTimes++;
    }
    public void Skip(){
        SkippingropeTimes++;
    }
    public void Hula(){
        HulahoopTimes++;
    }
}

//测试
public class Test extends Information{
    public static int choice = 0;
    public static Exercise exercise = new Exercise();
    //检测体重
    public static void Test(){
        System.out.println("Name: " + name);
        System.out.println("Weight: " + weight + "Kg");
        if (weight > 45) {
            //需要减肥
            System.out.println("You are a little overweight. Go to exercise!
Come on!");
            choice = 1;
        }
        else {
            //不需要减肥
            System.out.println("Teach me how to keep in shape. Please! www!");
            System.exit(0);
        }
    }

    public static void main(String[] args) {
        Test();
        if (choice == 1){
            System.out.println("Xiao Wang choose to ?");
        }
        Scanner scanner = new Scanner(System.in);
        String choices = scanner.next();
        //输入exercise选择减肥
        if (choices.equals("exercise")){
            int day = 0;
            int week = 7;
            Random random = new Random();
            int rd;
            while (day <= week){
                day++;
                for (int i = 0; i < 3; i++) {
                    rd = random.nextInt(3) + 1;//随机数来随机选择运动
```

```
                    if (rd == 1){
                        exercise.Run();//跑步次数
                    }
                    else if (rd == 2){
                        exercise.Skip();//跳绳次数
                    }
                    else if (rd == 3){
                        exercise.Hula();//呼啦圈次数
                    }
                }
                //7天即一周测一次体重
                if (day == 7){
                    if(Exercise.RunTimes >= 7 || Exercise.SkippingropeTimes >= 7
|| Exercise.HulahoopTimes >= 7){
                        //运动次数达到一定值体重下降
                        weight -= 5;
                        if (Exercise.RunTimes >= 7){
                            System.out.println("Runing...");
                        }
                        if (Exercise.SkippingropeTimes >= 7){
                            System.out.println("Skipping...");
                        }
                        if (Exercise.HulahoopTimes >= 7){
                            System.out.println("Hulaing...");
                        }
                    }try{
                        Thread.sleep(2800);
                    }catch (InterruptedException e){
                        e.printStackTrace();
                    }//延迟模拟时间变化
                    System.out.println("A week later...");
                    Test();
                    System.out.println("");
                    day = 0;
                    try{
                        Thread.sleep(2100);
                    }catch (InterruptedException e){
                        e.printStackTrace();
                    }
                }
            }
        }
        //彩蛋
        else if (choices.equals("lieflat")){
            System.out.println("College students should be like this!!!");
            System.exit(0);
        }
    }
}
```

Question18

```
class Buyer {
    public String buyer1;
```

```
    public String buyer2;
    public String buyer3;

    public void BuyVegetables(String name){
        System.out.println(name + " " + "has bought vegetables");
    }

    public void BuyMeat(String name){
        System.out.println(name + " " + "has bought meat");
    }

    public void BuyFish(String name){
        System.out.println(name + " " + "has bought fish");
    }

    public void BuyDrinks(String name){
        System.out.println(name + " " + "have bought drinks");
    }
}

class Dish {

}

class Cook {
    public String cook1;
    public String cook2;

    public void DoVegetables(String name) {
        System.out.println(name + " " + "makes a stew");
    }
    public void DoFish(String name){
        System.out.println(name + " " + "makes a sweet and sour fish");
    }

    public void DoMeat(String name){
        System.out.println(name + " " + "makes a braised pork");
    }

    public String[] dishname = {"Stew","Hongshaorou","Tangcuyu"};
    public void print(){
        for (int i = 0; i < dishname.length; i++) {
            System.out.println(dishname[i]);
        }
    }
}


public class Test {
    public static void Background(){
        System.out.println("Today is New Year's Eve.");
        System.out.print("My father, mother, aunts and I are going to work
together ");
        System.out.println("to cook the New Year's Eve dinner to celebrate the
festival");
```

```
    }

    public static void main(String[] args) {
        Background();
        String[] names = {"Dad","Mom","Gugu","Shenshen","I"};
        Buyer buyer = new Buyer();
        buyer.buyer1 = names[2];
        buyer.buyer2 = names[1];
        buyer.buyer3 = names[4];
        buyer.BuyVegetables(buyer.buyer1);
        buyer.BuyMeat(buyer.buyer2);
        buyer.BuyFish(buyer.buyer2);
        buyer.BuyDrinks(buyer.buyer3);
        Cook cook = new Cook();
        cook.cook1 = names[0];
        cook.cook2 = names[3];
        cook.DoVegetables(cook.cook2);
        cook.DoMeat(cook.cook1);
        cook.DoFish(cook.cook1);
        System.out.println("My family's New Year's Eve dinner is finished
now!");
        System.out.println("We have--");
        cook.print();
        System.out.println("and my favourite drinks--cola. Cheers!");
    }
}
```