Java实验2

实验2：控制结构

学习目标：

- 学习循环结构(for/while)
- 熟悉IDE的调试功能

学习内容

- 基础知识：for loop语法

```
for (initialization; test; update) {
    statement(s) to repeat;
}
```

示例

```
for (int i = 1; i <= 10; i++) {
    System.out.println("We're number one!");
}
```

- 编写代码输出如下内容（任务1：类名称Paragraph10)

```
10 bottles of beer on the wall, 10 bottles of beer
Take one down, pass it around, 9 bottles of beer on the wall

9 bottles of beer on the wall, 9 bottles of beer
Take one down, pass it around, 8 bottles of beer on the wall

... (output continues in the same pattern) ...

1 bottles of beer on the wall, 1 bottles of beer
Take one down, pass it around, 0 bottles of beer on the wall
```

- 编写循环控制代码，输出如下内容在（任务2：类名称Letter78）

```
aaabbbcccdddeeefffggg
hhhiiijjjkkklllmmmnnn
ooopppqqqrrrssstttuuu
vvvwwwxxyyyzzz
```

- 思考如下代码的输出内容，并运行验证

```
public static void stars() {
    for (int i = 1; i <= 10; i++) {
        for (int j = 1; j <= i; j++) {
            System.out.print("*");
        }
        for (int j = 1; j <= 20 - 2 * i; j++) {
            System.out.print(" ");
        }
        for (int j = 1; j <= i; j++) {
            System.out.print("*");
        }
        System.out.println();
    }
}
```

- 编写循环控制代码，输出如下图案（任务3：类名称Diamond）

```
      *
     * *
    *   *
   *     *
  *       *
   *     *
    *   *
     * *
      *
```

- 熟悉集成开发环境的调试功能，包括添加断点，菜单项：View Breakpoints/Step Into/Step Out/Run to Cursor等，以及变量观察窗

```
public class Numbers {
    public static void main(String[] args) {
        int number = 42;
        number = calc(number);
        int number2 = number * number;
        System.out.println("result = " + number2);
```

```
    }
    static int calc(int number){
        for (int i = 1; i <= 1000; i++) {
            number = number * 37 % 103;
        }
        return number;
    }
}
```

- 找出如下代码中的所有错误

```
public class Parameters {
    public static void main() {
        double bubble = 867.5309;
        double x = 10.01;
        printer(double x, double y);
        printer(x);
        printer("barack", "obama");
        System.out.println("z = " + z);
    }

    public static void printer(x, y double) {
        int z = 5;
        System.out.println("x = " + double x + " and y = " + y);
        System.out.println("The value from main is: " + bubble);
    }
}
```

public class Parameters {
public static void main(String[] args) {
double bubble = 867.5309;
double x = 10.01;
double y = 5.3;
printer(~~double~~ x, ~~double~~ y);
printer(x, 0.0);
~~printer("barack", "obama");~~
int z = 5;
System.out.println("z = " + z);
}

public static void printer(**double** x, **double** y) {
System.out.println("x = " + **x** + " and y = " + y);
~~System.out.println("The value from main is: " + bubble);~~

int z = 5;
}
}

- 基础知识：while循环

```
int num = 1;
while (num < 5) {
    System.out.print(n + " ");     // output: 1 2 3 4
    n++;
}
```

示例

```
int x = 1;
System.out.print(x);
while (x < 100) {
    x = x + x;
    System.out.print(", " + x);
}
```

- 使用while循环，编写函数digitSum(int)，计算一个数字中全部的数字和，例如，计算digitSum(29107)，应该返回19（任务4：类名称DigitSum）
    - 测试例：
    - digitSum(12345678901112)
    - digitSum(900900)
    - digitSum(0000000)
- 打印漂亮的99表（任务5：类名称NineNineTable）