

# Tutorial For Control Statement 1

Based on the tutorial of "2020S-Java-A" and "2020F-Java-A" designed by teaching group in SUSTech

Modified (mainly change to markdown file) by ZHU Yueming in 2021. March. 1st

## Objectives

1. Learn how to obtain user input from command line arguments or by the Scanner class.
2. Learn how to use the if and if...else selection statements to choose between alternative actions.
3. Learn how to use the while repetition statement to execute statements in a program repeatedly.

## Before Exercises

If we run a Java Program by using the command **"java Hello I Love Programming"** where the name of the class is "Hello", then it will run `Hello.class`. For the string after the class name "Hello", i.e "I Love Programming", these are command line arguments.

When command line arguments are supplied to JVM, JVM wraps these and supply to `String[]` args in your main method. It can be confirmed that they are actually wrapped up in args array by checking the length of args using `args.length`.

Write an application to get user's name, age, weight and grade through command line arguments, then prints out in a specific format.

Sample code:

```
public class Lab3_E1 {
    public static void main(String[] args) {
        String name = args[0];
        int age = Integer.parseInt(args[1]);
        float weight = Float.parseFloat(args[2]);
        char grade = args[3].charAt(0);

        System.out.printf("You are %s. \nYou are %d years old. \n", name, age);
        System.out.printf("You weigh %.1f KG. \nThe highest grade you got is %c. \n",
weight, grade);
    }
}
```

Run by command line:

```
~>javac Lab3_E1.java
~>java Lab3_E1 ZHANGSAN 60 55.5 A
You are ZHANGSAN.
You are 60 years old.
You weigh 55.5 KG.
The highest grade you got is A.
```

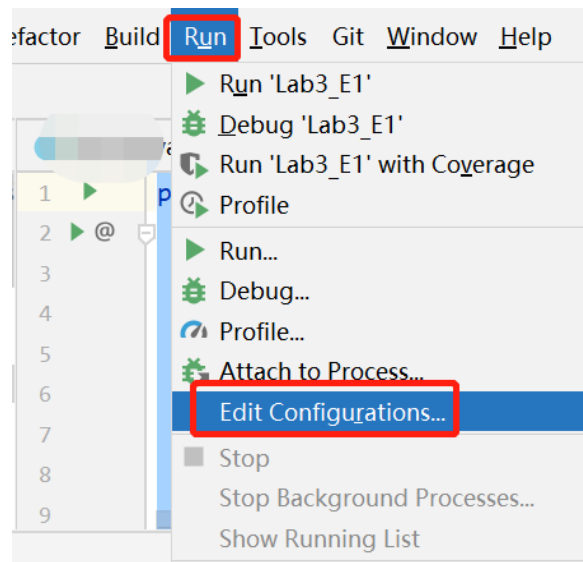
## Run by IntelliJ IDEA

Then if you run it in IntelliJ IDEA, the result would be returned as below, which means we haven't set enough arguments before running the program.

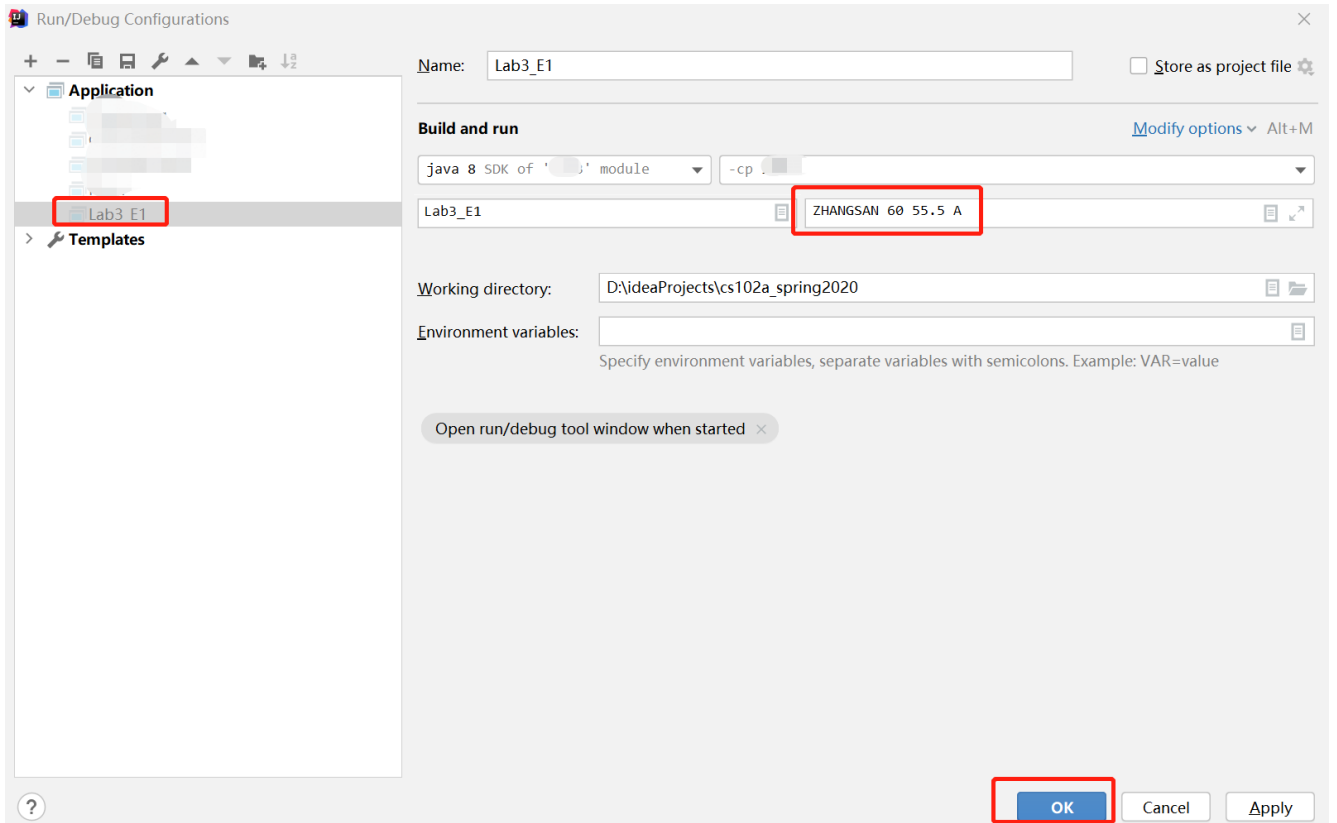
```
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 0
    at Q1.main(Q1.java:3)
```

Set arguments in IntelliJ IDEA:

- Step 1: Run -> Edit Configurations



- Step 2: Set parameters



- Step 3. Run the program again, the result would be:

```
You are ZHANGSAN.
You are 60 years old.
You weigh 55.5 KG.
The highest grade you got is A.

Process finished with exit code 0
```

## Exercises

1. Write an application which can convert the grades on 100-point scale into GPA according to the following table.

Grade	gpa
100~90	4.0
89~80	3.0
79~70	2.0
69~60	1.0
59~0	0

Sample output:

```
C:\Users\Yepang Liu\Desktop\Java>javac GPA. java

C:\Users\Yepang Liu\Desktop\Java>java GPA 96
You pass the exam.
You score is 96.0, the GPA is 4.0

C:\Users\Yepang Liu\Desktop\Java>java GPA 85
You pass the exam.
You score is 85.0, the GPA is 3.0

C:\Users\Yepang Liu\Desktop\Java>java GPA 77
You pass the exam.
You score is 77.0, the GPA is 2.0

C:\Users\Yepang Liu\Desktop\Java>java GPA 60
You pass the exam.
You score is 60.0, the GPA is 1.0

C:\Users\Yepang Liu\Desktop\Java>java GPA 59
You failed in the exam.
You score is 59.0, the GPA is 0.0
```

2. Create a class called `GuessingNumber`. In the main method, you should generate a random integer `magicNum` between 0 and 9, then keep asking the user to input an integer between 0 and 9 until the input number is equal to the attribute `magicNum`. When the input number is greater than the attribute `magicNum`, the method should output "Too big!Please try again:".When the input number is less than the attribute `magicNum`, the method should output "Too small!Please try again:". Then the method waits for the user to input a new integer. When the input number is equal to the attribute `magicNum`, the method should output "Congratulations!" and terminate.

Sample output 1:

```
Please input an Integer in {0,1,2,...,9}:
8
Too big!Please try again:
2
Too small!Please try again:
5
Congratulations!
```

Sample output 2:

```
Please input an Integer in {0,1,2,...,9}:
5
Too big!Please try again:
2
Too big!Please try again:
1
Congratulations!
```

Sample code:

```
import java.util.Scanner;
import java.util.Random;

public class GuessingNumber {
    public static void main(String[] args) {
        Random random = new Random();
        int magicNum = random.nextInt(10);
        int inputNum;
        Scanner sc = new Scanner(System.in);

        System.out.println("Please input an Integer in {0,1,2,...,9}:");
        inputNum = sc.nextInt();

        while(_____) { // to finish it
            if (_____) // to finish it
                System.out.println("Too big!Please try again:");
            else
                System.out.println("Too small!Please try again:");
            _____ //to finish it
        }

        System.out.println("Congratulations!");
        sc.close();
    }
}
```