

# Tutorial for Control Statement 1

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

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## 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);
    }
}
```

**Think:** what if we directly execute this code? What happens and why?

## 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.
```

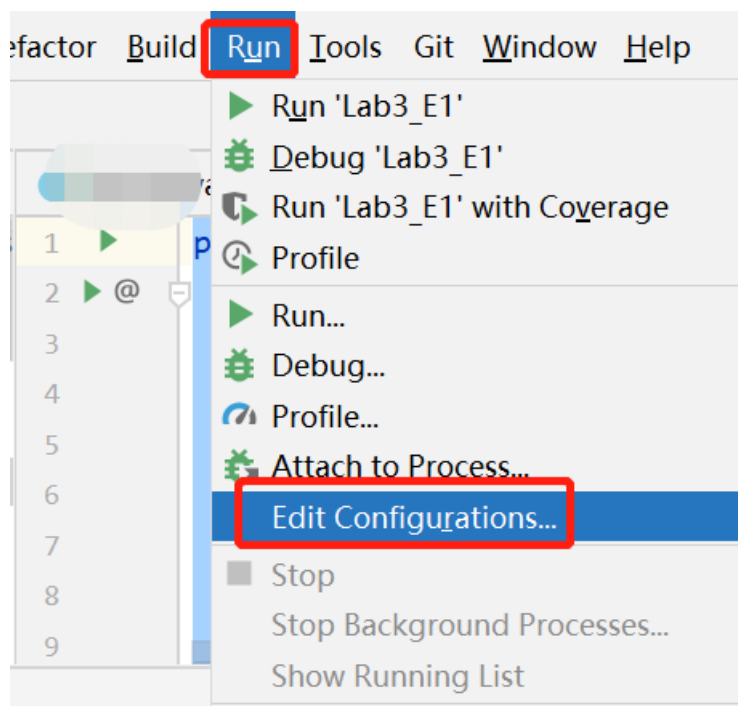
## Run by IntelliJ IDEA

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.

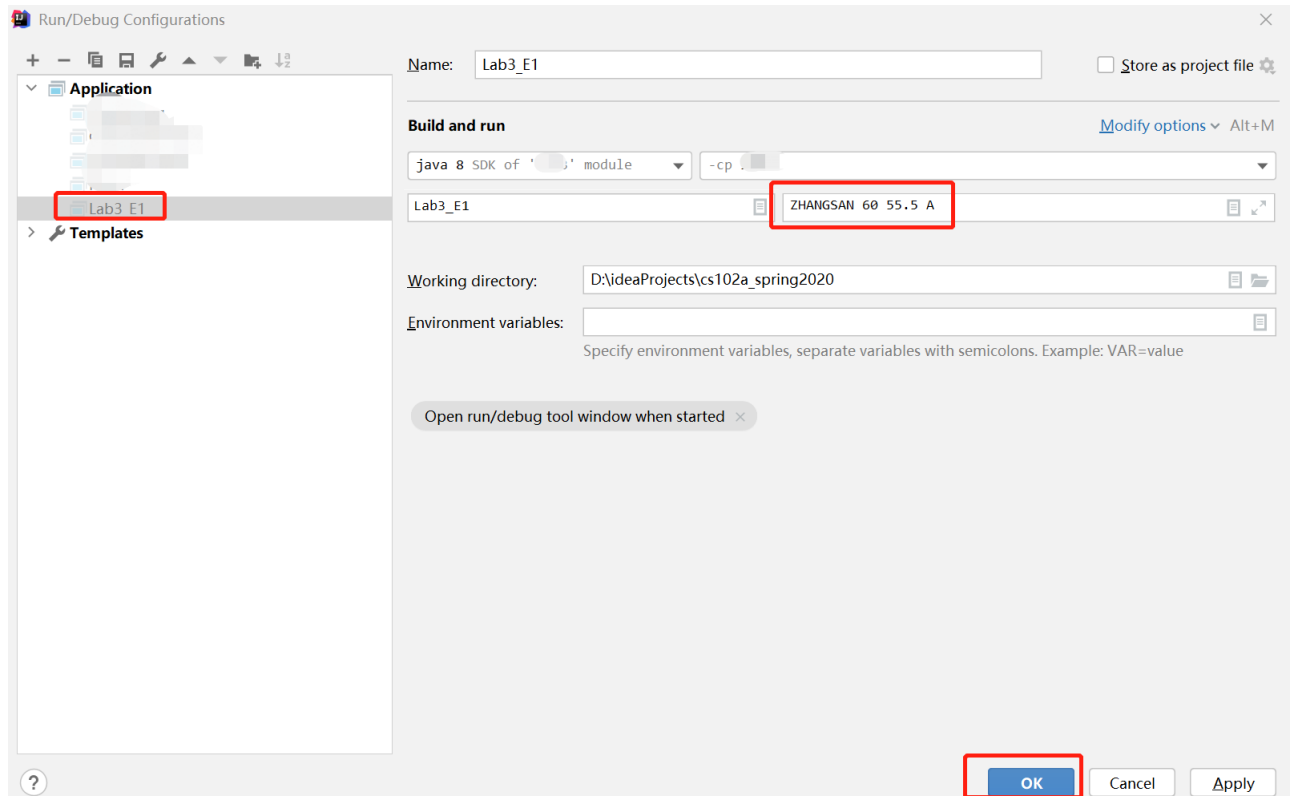
```
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 0
    at Q1.main(Q1.java:3)
```

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
```

**Think:** What happens if you enter 21.5 to the age? We will talk about exception handling later.

## Exercises

1. Write a time converter that prompts the user to enter the number of seconds then prints the equivalent time in hours, minutes and seconds. For example:

```
Enter the number of seconds: 7402  
The equivalent time is 2 hours 3 minutes and 22 seconds
```

2. 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:

```
> javac GPA.java

> java GPA 96
You passed the exam.
Your score is 96.0, the GPA is 4.0

> java GPA 77
You passed the exam.
Your score is 77.0, the GPA is 2.0

> java GPA 59
You failed the exam.
Your score is 59.0, the GPA is 0.0
```

3. 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 `magicNum`. When the input number is greater than `magicNum`, the method should output "Too big!Please try again:". When the input number is less than `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 `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:

```
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 be filled in  
        if (____) // to be filled in  
            System.out.println("Too big!Please try again:");  
        else  
            System.out.println("Too small!Please try again:");  
        _____ // to be filled in  
    }  
  
    System.out.println("Congratulations!");  
    sc.close();  
}
```