Tutorial For Input Statement

> 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 use input and output statements, especially by printf statement.
2. Learn how to obtain user input from command line arguments or by the Scanner class.
3. Learn how to use the `if` and `if…else` selection statements to choose between alternative actions.

Before Exercises

1. Input by Scanner

Write a program that prompts the user to enter his information, and then prints out in a specific format:

```
import java.util.Scanner;

public class Information {
    public static void main(String[] args) {
        String name;
        int age;
        float weight;
        char grade;

        // Creating object of Scanner class
        Scanner input = new Scanner(System.in);

        System.out.print("Enter your name: ");
        name = input.next();
        System.out.print("Enter your age: ");

        age = input.nextInt();
        System.out.print("Enter your weight in KG: ");
        weight = input.nextFloat();
        System.out.print("Enter your highest grade in last semester: ");
        grade = input.next().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);
    }
}
```

The output looks like this:

```
Enter your name: Jack
Enter your age: 20
Enter your weight in KG: 60.5
Enter your highest grade in last semester: A
You are Jack.
You are 20 years old.
You weigh 60.5 KG.
The highest grade you got is A
```

What happens if you enter 21.5 to the age? Try it out. We will talk about exception handling later in this course.

printf:

%	type of data	example
%d	byte, short, int, long	34, 55, 2
%f	float, double	35.44, 0.123
%s	String	"hello world"
%c	char	'h', '1'

2. Passing arguments by Command Line

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 LAB3BE {
    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 LAB3BE.java
>java LAB3BE 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.
```

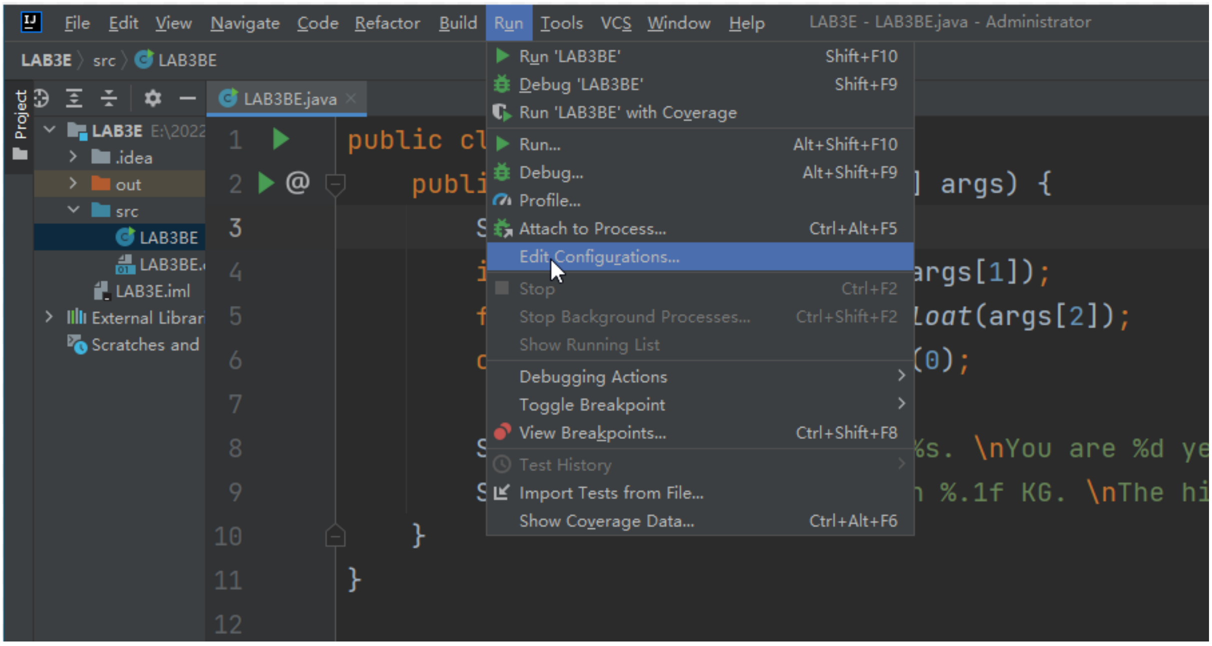
Run by Intellij IDEA:

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.

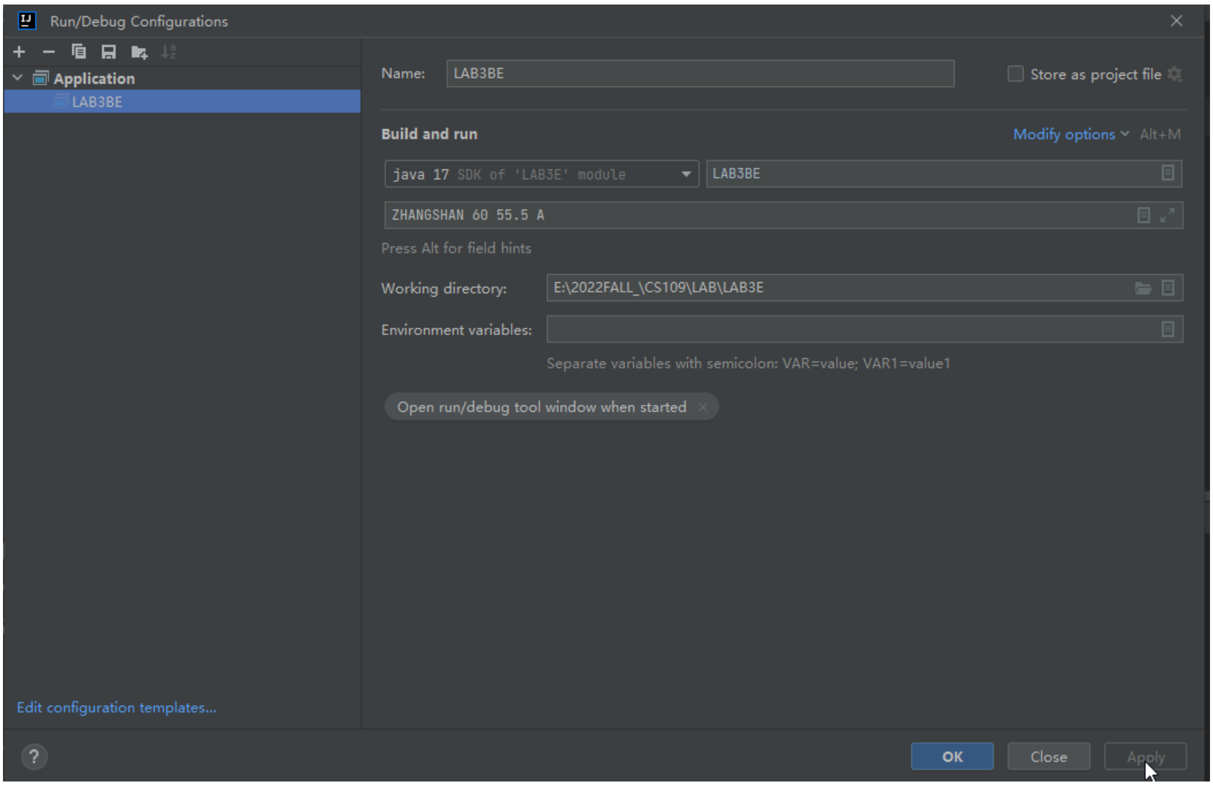
```
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index 0 out of bounds for length 0
  at LAB3BE.main(LAB3BE.java:3)
```

Set arguments in Intellij IDEA:

- Step 1: Run -> Edit Configurations



- Step 2: Set parameters


Run/Debug Configurations
Application
LAB3BE
Build and run
Modify options Alt+M
Press Alt for field hints
Separate variables with semicolon: VAR=value; VAR1=value1
Open run/debug tool window when started
Edit configuration templates...
OK
Close
Apply

Name: LAB3BE

□ Store as project file

java 17 SDK of 'LAB3E' module

LAB3BE

ZHANGSHAN 60 55.5 A

Working directory: E:\2022FALL_\CS109\LAB\LAB3E

Environment variables:

- 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

Exercise 1 (Basic statement)

Write a program that prompts the user to enter the height and width of a rectangle then prints the area and perimeter of the rectangle. The area and perimeter should be printed to the nearest two decimal place. The output looks like this:

```
Enter the width of a rectangle: 1.7
Enter the height of a rectangle: 2.4
The area is 4.08
The perimeter is 8.20
```

Exercise 2 (Basic statement)

Write a time converter that prompts the user to enter the number of seconds then prints the equivalent time in hours, minutes and seconds. The output looks like this:

Exercise 3 (Control statement)

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 LAB3E1.java

> java LAB3E1 96
You passed the exam.
Your score is 96.0, the GPA is 4.0

> java LAB3E1 85
You passed the exam.
Your score is 85.0, the GPA is 3.0

> java LAB3E1 77
You passed the exam.
Your score is 77.0, the GPA is 2.0
```

```
> java LAB3E1 60
You passed the exam.
Your score is 60.0, the GPA is 1.0

> java LAB3E1 59
You failed in the exam.
Your score is 59.0, the GPA is 0.0
```