

CS110T: Programming Language1

Lab 2: Java basics I



Lab Objectives:

In this lab, the student will practice:

- ✓ Program debugging
- ✓ Creating, compiling and running a simple Java program.
- ✓ Define variables of different data types and use constants.
- ✓ Write a Java program using pseudocode, and a flowchart.
- ✓ Using `System.out.println` in printing output.

Lab Exercise 1: Program Debugging (1)

Problem Description: The following program does not compile. Fix all the compilation errors so that the program will compile successfully (9 errors).

```
// Lab Exercise 3: Javal.java
// Identifying and Correcting Errors

public Class
{
    // main method begins execution of Java application
    public static void main( string args[] );
{
    system.out.println("Programming is","an exercise in learning
how to learn");
    System.out.print(learning is never done without errors ")
} // end of Javal class
```

Lab Exercise 2: Code writing (1)

Write a Java code based on the following pseudocode :

A. Calculate the Perimeter of a Rectangle Pseudocode:

1. Declare length as a float.
2. Declare width as a float.
3. Declare perimeter as a float.
4. Initialize length to 15.0.
5. Initialize width to 7.0.
6. Set perimeter to 2 * (length + width).
7. Print length.
8. Print width.
9. Print perimeter.

Lab Exercise 1: Program Debugging (1)

Answer:

```
// Lab Exercise 3: Java1.java
// Identifying and Correcting Errors
public Class
{
// main method begins execution of Java application public static void main( string args[] );
{
system.out.println("Programming is","an exercise in learning how to learn");
System.out.print("learning is never done without errors ") }
} // end of Java1 class
```

1. Add a class name after public class. For example, public class Java1
2. "Class" should be lowercase. Change Class to class.
3. S in String should be capitalized. Change string to String
4. Remove the semicolon after the main method header. Change public static void main(String args[]); to public static void main(String[] args)
5. "System" should start with an uppercase S. Change system.out.println to System.out.println
6. println can only take one argument. Remove the extra argument. Change System.out.println("Programming is","an exercise in learning how to learn"); to System.out.println("Programming is an exercise in learning how to learn");
7. Add a missing starting quotation mark in the second print statement. Change System.out.print(learning is never done without errors ") to System.out.print("learning is never done without errors")
8. Add missing simicolone at the end of the second print statement System.out.print("learning is never done without errors") to System.out.print("learning is never done without errors");
9. Add the missing closing curly brace } to properly close the class.

Lab Exercise 2: Code writing (1) Answer

A)

```
public static void main( String[] args )
{
    float length, width, perimeter;

    length = 15.0f;
    width = 7.0f;
    perimeter = 2 * (length + width);

    System.out.println("Rectangle Length: " + length);
    System.out.println("Rectangle Width: " + width);
    System.out.println("Rectangle Perimeter: " + perimeter);
}
```

B. Calculate the Area of a Rectangle Pseudocode:

1. Declare length as a double.
2. Declare width as a double.
3. Declare area as a double.
4. Initialize length to 8.0.
5. Initialize width to 5.0.
6. Set area to length * width.
7. Print length.
8. Print width.
9. Print area.

C. Calculate the Area of a Triangle Pseudocode:

1. Declare base as a double.
2. Declare height as a double.
3. Declare area as a double.
4. Initialize base to 10.0.
5. Initialize height to 6.0.
6. Set area to (base * height) / 2.
7. Print base.
8. Print height.
9. Print area.

Lab Exercise 3: Code writing (2)

Problem Description: For the pseudocode problem you wrote (in Lab 1 - Exercise 1 Question A) write the java code to implement it.

Design an algorithm to convert a US Dollar to Saudi Riyal. Hint: 1 US Dollar = 3.75 Saudi Riyal.

Pseudocode:

- Use variables “dollar” and “riyal “of type floating point.
- Input dollar.
- $\text{riyal} = 3.75 * \text{dollar}$.
- Print riyal.
- End program.

Lab Exercise 2: Code writing (1) **Answer**

B)

```
public static void main( String[] args )
{
    double length, width, area;

    length = 8.0;
    width = 5.0;
    area = length * width;

    System.out.println("Rectangle Length: " + length);
    System.out.println("Rectangle Width: " + width);
    System.out.println("Rectangle Area: " + area);
}
```

C)

```
public static void main( String[] args )
{
    double base, height, area;

    base = 10.0;
    height = 6.0;
    area = (base * height) / 2;

    System.out.println("Triangle Base: " + base);
    System.out.println("Triangle Height: " + height);
    System.out.println("Triangle Area: " + area);
}
```

Lab Exercise 3: Code writing (1) **Answer**

```
public static void main(String[] args) {
    float dollar = 10.0f;
    float riyal;

    riyal = 3.75f * dollar;

    System.out.println("Amount in US Dollars: " + dollar);
    System.out.println("Equivalent amount in Saudi Riyals: " + riyal);
}
```

Lab Exercise 4: Code writing (3)

Problem Description: Write a Java program that implements lab evaluation from this flow chart. (Assume that rubric point are R1=1, R2=0, R3=0, R4=1, R5=2, lab evaluation = 5)

Output

Output example:
Welcome week4 – LAB
Course CS110
your lab evaluation is 4.0 out of 5

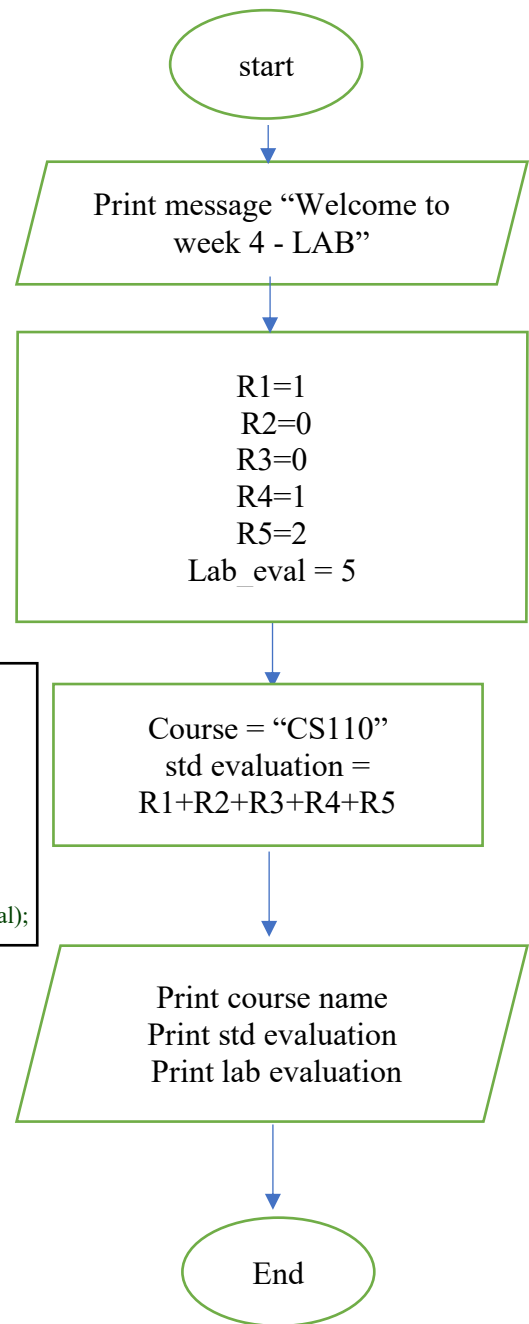
```
System.out.println("Welcome to week 4 - LAB");
```

```
int R1=1, R2=0,R3=0,R4=1, R5=2, Lab_eval=5;  
String Course = "CS110";
```

```
double std_evaluation = R1+R2+R3+R4+R5;
```

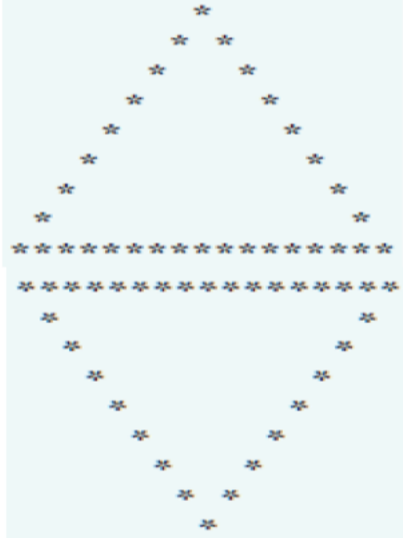
```
System.out.println("Course " + Course);
```

```
System.out.println("your lab evaluation is " + std_evaluation + " out of " + Lab_eval);
```



Assignment Problems:

- 1- Write a Java program that prints the following shape:



```
System.out.println("\t*");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println(" *      *");
System.out.println("*****");
System.out.println("*****");
System.out.println(" *      *");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println("    *  *");
System.out.println("\t*");
```

- 2- **Problem Description:** What is the expected output of the following program:

```
public class Homework
{
    public static void main (String args[])
    {
        System.out.println("Teachers can open the door, but you must enter
it yourself. \t\t Chinese proverb");

        System.out.println("Edition"+2+5);
    }
}
```

- 3- **Problem Description:** The following code segment does not compile. Fix all the compilation errors so that the program will compile successfully.

```
// Find the Syntax errors and Correct them

public class Java Application
{
    public static void main[string[] args]
    {
        System.Out.print( " lab practice ");
        System.out.println("Just keep " , "practicing");
    }
}
```

4- **Problem Description:** The following program has syntax errors. Correct them.

```
public class ProgAWithErrors
{
    Public static main (String [] args)
    {
        Int one, two;
        double Num1; Num2;

        one = 18;
        two ="apple";
        three = 3;

        Num1 = 25.5;
        Num2 = Num1 * three;

        System.out.printf("%s \t %f \t %s\n",one,
        Num1,Num2, (Num2/3));
    }
}
```