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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.
- 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: 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
```

```
public class Java1
{
  // 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");
  }
}
```

Errors Fixed:

1. Class → class Java1 (class name required, case-sensitive)
2. string → String (case-sensitive)
3. Removed semicolon after main(String args[])
4. system → System (case-sensitive)
5. Fixed concatenation issue in first print statement

6. Added missing quote at start of second print statement
7. Fixed line break in string literal
8. Added missing closing brace for the class
9. Removed extra comma in println parameters

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.

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

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

      System.out.println("Length: " + length);
      System.out.println("Width: " + width);
      System.out.println("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.

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

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

      System.out.println("Length: " + length);
      System.out.println("Width: " + width);
      System.out.println("Area: " + 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.

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

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

      System.out.println("Base: " + base);
      System.out.println("Height: " + height);
      System.out.println("Area: " + 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.
- riyal = 3.75 * dollar.
- Print riyal.
- End program.

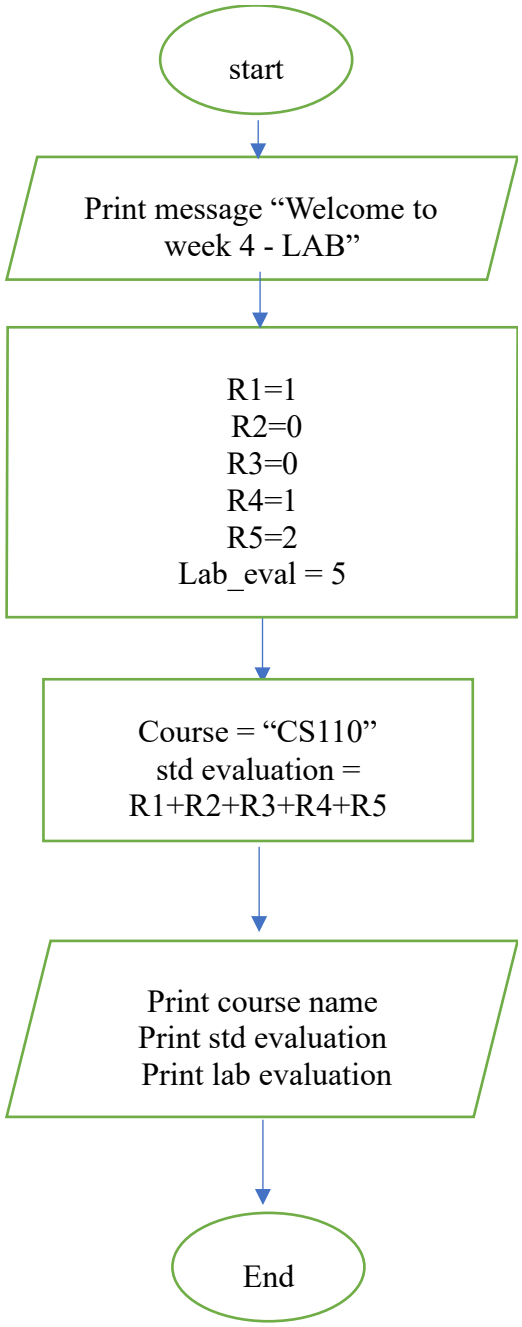
```
import java.util.Scanner;

public class CurrencyConverter {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);

      float dollar;
      float riyal;

      System.out.print("Enter amount in US Dollars: ");
      dollar = scanner.nextFloat();

      riyal = 3.75f * dollar;

      System.out.println(dollar + " US Dollars = " + riyal + " Saudi Riyals");

      scanner.close();
   }
}
```

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)

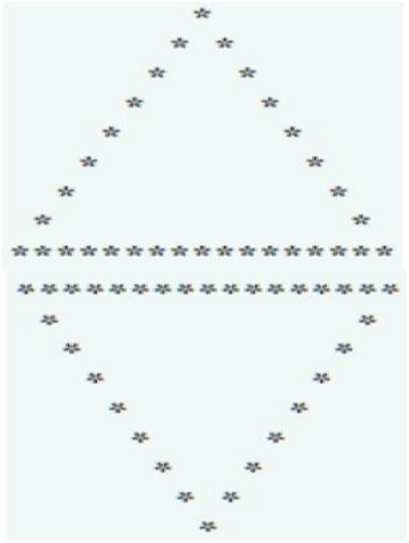
Output example:
Welcome week4 – LAB
Course CS110
your lab evaluation is 4.0 out of 5

```
public class LabEvaluation {

  public static void main(String[] args) {

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


    String course = "CS110";

    int R1 = 1;

    int R2 = 0;

    int R3 = 0;

    int R4 = 1;

    int R5 = 2;

    int lab_eval = 5;


    int 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:



```
public class ShapePrinter {
   public static void main(String[] args) {
      System.out.println("   *");
      System.out.println("  * *");
      System.out.println(" *   *");
      System.out.println("*******");
      System.out.println("*******");
      System.out.println(" *   *");
      System.out.println("  * *");
      System.out.println("   *");
   }
}
```

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);
}
}
```

```
Teachers can open the door, but you must enter it yourself.          Chinese proverb
Edition25
```

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");  }
```

```
public class JavaApplication
{
    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));
  }}
```

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

      one = 18;
      two = 0; // Changed from "apple" to numeric value
      three = 3;
      Num1 = 25.5;
      Num2 = Num1 * three;

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