Lab Sheet 4 – Methods and Parameters

Try-outs

Try out the following sets of code-snippet. And observe the output/errors are generated.

1)

```
public class tryout{
    public static void main(String[] args)
      {
            int x = 1;
            int y = 5;
            System.out.println("Before swap, x = "+x+", y = " + y);
            swap(x, y);
            System.out.println("After swap, x = "+x+", y = " + y);
      }

           public static void swap(int x, int y)
            {
                  int tmp = x;
                  x = y;
                  y = tmp;
                  return;
            }

}
```

2)

```
public class tryout{
      public static void main(String[] args)
      {
            System.out.println(foo(7, 19));
      }
      public static int bar(int x, int y, int z) {
                  return x + y - z;
            }
      public static int foo(int x, int y) {
                  return bar(x, y, x + y);
            }

      }
```

Main Questions

1. Your friend has started a small baby shop and sells the products Bottles (Rs 35.50 each), Diapers (Rs. 9.95 each) and Rattles (Rs. 7.00 each) for now. He has requested your help to write a java program using method to generate the customer bill. The method accepts the customer name and quantity of items purchased. Your method has to generate a pretty nice bill which looks something like this.

   For Sample input **"Abhijit Choudhry",2,30,1**: The following output should be generated:-

```
Customer Name: Abhijit Choudhry

Item                 Rate               Number                 Cost

Bottle              35.50                    2                71.00

Diaper               9.95                   30               298.50

Rattle               7.00                    1                7.00

-------------------------------------------------------------------

Total                                                        376.50

-------------------------------------------------------------------
```

2. Write a program that accepts two numbers and perform the following using methods
   a. Sum of 2 numbers
   b. Product of 2 numbers
   c. Average of 2 numbers
   d. Minimum value among 2 numbers
   e. Maximum value among 2 numbers

3. Modify the above program such that it accepts 3 numbers and perform the following
   a. Sum of first and second number
   b. Product of first and second number
   c. Average of first and second number
   d. Minimum of first and second number
   e. Maximum of first and second number
   f. Sum of first and third number
   g. Product of first and third number
   h. Average of first and third number
   i. Minimum of first and third number
   j. Maximum of first and third number
   k. Sum of all three numbers [Use Method Overloading]
   l. Product of all three numbers [Use Method Overloading]
   m. Average of all three numbers [Use Method Overloading]

4. The lights over the staircase are turned on if the switch at the top of the stairs is on and the one at the bottom is off, or vice versa, i.e., if the switch at the top of the stairs is off and the one at the bottom is on. Implement the method 'light_state' which returns true or false depending on the state of the switches at the top and bottom of the stairs (Read the state of the switches from user). Show two implementations.
    a. Using an if – else if – else statement
    b. Using a switch statement

5. Write a Java program to all prime numbers between 1 and the given number using method

6. Write a program to check whether the given number is an Armstrong number or not using a method. The method should accept the number as an argument and return the result in string to indicate that is Armstrong or not. The result should be printed inside the main method (Hint: Armstrong number is a number that is equal to the sum of cubes of its digits. For example 0(03 = 0) , 1(13 =1) , 153 (13+53+33 =153))

7. Modify the above program such that the method accepts two numbers and it will print all Armstrong numbers within that range)

8. Write a recursive method that prints the Fibonacci series from 1 to N (Hint: The Fibonacci Sequence is the series of numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ..)

Advanced and Bonus Questions

9. Write a method that accepts two numbers and print all perfect numbers within the range (Hint: Perfect number, a positive integer that is equal to the sum of its proper divisors. The smallest perfect number is 6, which is the sum of 1, 2, and 3. Other perfect numbers are 28, 496, and 8,128)

10. Write a recursive method to find out the sum of the digits of any number.

11. Write a recursive method that compute the sum of the series 1!/1+2!/2+3!/3+4!/4+... +N!/N
