Laboratório 08 -Decomposição Procedimental (12/10/2014)

1.

```
package sessão09_10;

public class Lab08p1 {

   public static void main(String[] args)
   {
      methodA(3,4,9,7);
   }

   public static void methodA(int a, int b, int c, int d)
   {
      System.out.println(methodB(a,c) + methodC(b,d));     //12 + 11 = 23
   }

   public static int methodC(int i, int j)
   {
      methodD(i + "+" + j);              // print 4 + 7      => return to MethodA 11
      return i + j;
   }

   public static int methodB(int i, int j)
   {
      return methodC(i, j);           // print 3 + 9      => return to MethodA 12
   }

   public static void methodD(String string)
   {
      System.out.println(string);
   }
}
```

Output:

3+9
4+7
23

2.

```
package sessão09_10;

public class Lab08p2 {
      public static void main(String[] args)
      {
         int array[] = { 84, 69, 76, 34, 86, 94, 91 };
         sortArray(array);
         printArray(array);
      }

      public static void printArray(int[] array)
      {
         System.out.print("[ ");
         for (int i = 0; i < array.length; i++)
            System.out.print(array[i] + " ");
         System.out.print("]");
      }

      public static void sortArray(int[] num)
      {
         int n = num.length;
         for (int i = 0; i < n; i++)
```

```
            {
                for (int j = 1; j < (n - i); j++)
                {
                    if (num[j - 1] > num[j]) //comparação entre elementos sucessivos do array
                    {                 // se o elemento j-1 for superior ao elemento j => trocar
                        swap(num, j);
                    }
                }
            }
        }

        public static void swap(int[] num, int idx)  // troca dos elementos do array
colocando-os por ordem decrescente
        {
            int temp = 0;
            temp = num[idx - 1];
            num[idx - 1] = num[idx];
            num[idx] = temp;
        }
}
```

Output:

```
[ 34 69 76 84 86 91 94 ]
```

3.

```
package sessão09_10;
import java.util.Scanner;

public class Lab08p3 {

        public static double specifyRadius()
        {
            Scanner input = new Scanner(System.in);
            double rad  = input.nextInt();
            return rad;
        }

        public static double specifyHeight()
        {
            Scanner input = new Scanner(System.in);
            double hgt  = input.nextInt();
            return hgt;
        }

        public static double calculateBaseArea(double rad)
        {
            double baseArea;
            baseArea = Math.PI * Math.pow(rad, 2);
            return baseArea;
        }

        public static double calculateLateralArea(double rad, double hgt)
        {
            double lateralArea;
            lateralArea = hgt *2*Math.PI*rad;
            return lateralArea;
        }

        public static double calculateTotalArea(double rad, double hgt)
        {
```

```
            double totalArea;
            totalArea = calculateLateralArea(rad, hgt) + 2 * calculateBaseArea(rad);
            return totalArea;
        }

        public static double calculateVolume(double rad, double hgt)
        {
            double volume;
            volume = hgt*calculateBaseArea(rad);
            return volume;
        }

        public static void main(String[] args)
        {
            double radius;
            double height;
            double baseArea;
            double lateralArea;
            double totalArea;
            double volume;

            System.out.println("Enter the dimensions of the cylinder");
            radius = specifyRadius();
            height = specifyHeight();
            baseArea = calculateBaseArea(radius);
            volume = calculateVolume(radius, height);
            System.out.println("\nCylinder Characteristics");
            System.out.println("Radius: " + radius);
            System.out.println("Height: " + height);
            System.out.println("Base Area: " + baseArea);
            System.out.println("Volume: " + volume);
        }
}
```

Output:

```
Enter the dimensions of the cylinder
5
10

Cylinder Characteristics
Radius: 5.0
Height: 10.0
Base Area: 78.53981633974483
Volume: 785.3981633974483
```