

## Assignment 4

1- Write a Java program that uses a set of 3 functions capable, collectively, of finding the maximum of anywhere between 2 and 4 numbers. Each one should take integer arguments and return an integer.

*Hint: Use overloading, and think about how you can build larger functions out of smaller ones.*

```
public class Numbers
{
    public static int maximum( int x, int y )
    {
        return ( x > y ? x : y );
    }
    public static int maximum( int x, int y, int z )
    {
        int preMax = maximum(x, y);
        return ( preMax > z ? preMax : z );
    }

    public static int maximum( int x, int y, int z, int w )
    {
        int preMax = maximum(x, y, z);
        return ( preMax > w ? preMax : w );
    }

    public static void main(String[] args)
    {
        int number1,number2,number3, number4;
        number1 = 5;
        number2 = 12;
        number3 = 24;
        number4 = 2;
        System.out.println("The max of the first two numbers is "+ maximum(number1,
            number2));
        System.out.println("The max of the first three numbers is "+ maximum(number1,
            number2,number3));
        System.out.println("The max of the four numbers is "+ maximum(number1,
            number2,number3,number4));
    }
}
```

Another way to write the methods:

```
public static int maximum( int x, int y )
{
    If (x > y)
        return x;
    else
        return y;
}
public static int maximum( int x, int y, int z )
{
    int max;
    max = x;
    if (max < y)
        max = y;
    if (max < z)
        max = z;
    return max;
}

public static int maximum( int x, int y, int z, int w )
{
    int max;
    max = x;
    if (max < y)
        max = y;
    if (max < z)
        max = z;
    if (max < w)
        max = w;

    return max;
}
```

2- Given the following scores of four students in an exam:

12, 20, 9, 15

Write a Java program using methods that calculates: sum of scores, mean score, the variance of scores, maximum score, minimum score, range of scores.

```
public class Scores4
{
    public static float sum( float x1, float x2, float x3, float x4 )
    {
        return (x1 + x2 + x3 + x4 );
    }
    public static float mean( float x1, float x2, float x3, float x4 )
    {
        return sum( x1,x2,x3,x4 ) / 4;
    }
}
```

```

public static float variance( float x1, float x2, float x3, float x4 )
{
    float E2 = mean(Math.pow(x1,2), Math.pow(x2,2), Math.pow(x3,2), Math.pow(x4,2));
    float E1 = Math.pow(mean(x1,x2, x3, x4),2);
    return E2 - E1;
}
public static float largest( int x1, int x2, int x3, int x4 )
{
    int max;
    max = x1;
    if (max < x2)
        max = x2;
    if (max < x3)
        max = x3;
    if (max < x4)
        max = x4;
    return max;
}
public static float smallest( int x1, int x2, int x3, int x4 )
{
    int min;
    min = x1;
    if (min > x2)
        min = x2;
    if (min > x3)
        min = x3;
    if (min > x4)
        min = x4;
    return min;
}
public static float range( int x1, int x2, int x3, int x4 )
{
    return largest(x1,x2,x3,x4) - smallest(x1,x2,x3,x4);
}

public static void main(String[] args)
{
    float score1,score2,score3, score4;
    score1 = 12.0;
    score2 = 20.0;
    score3 = 9.0;
    score4 = 15;
    System.out.println("The sum of the four scores = "+ sum(score1,score2,score3, score));
    System.out.println("The mean score = "+ mean(score1,score2,score3, score));
    System.out.println("The variance of scores = "+ variance(score1,score2,score3, score));
    System.out.println("The largest score = "+ largest(score1,score2,score3, score));
    System.out.println("The smallest score = "+ smallest(score1,score2,score3, score));
    System.out.println("The range of scores = "+ range(score1,score2,score3, score));
}

```