Ahmad Siddiq Priaji (22/496854/PA/21370)

Homework 2

1. Rectangle
   - Code Rectangle.java

```java
public class Rectangle {
    double width;
    double height;
}
```

1) Menampilkan infromasi dari objek Rectangle yang direferensikan oleh variable

```java
public class TestRectangle {
    public static void main(String[] args) {
        Rectangle rect0 = new Rectangle();
        rect0.width = Math.random();
        rect0.height = Math.random();

        Rectangle rect1 = new Rectangle();
        rect1.width = Math.random();
        rect1.height = Math.random();

        // (1) start...
        double area0 = rect0.width * rect0.height;
        double area1 = rect1.width * rect1.height;
        System.out.println("rect0\n" + "width: " + rect0.width );
        System.out.println("height: " + rect0.height );
        System.out.println("area: " + area0 );

        System.out.println("rect1\n" + "width: " + rect1.width );
        System.out.println("height: " + rect1.height );
        System.out.println("area: " + area1 );
        // ...(1) end
    }
}
```

Hasil:

```
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> javac *.java
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> java TestRectangle
rect0
width: 0.22112546329660876
height: 0.680572413601052
area: 0.15049189026442386
rect1
width: 0.08950823189302937
height: 0.227712204663995
area: 0.020382116819937828
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2>
```

2) Menggunakan array rects

```
public class TestRectangle {
    public static void main(String[] args) {
        // (2) start...
        Rectangle[] rects = new Rectangle[2];
        double[] area = new double[2];
        for (int i=0; i<2; i++){
            rects[i] = new Rectangle();
            rects[i].width = Math.random();
            rects[i].height = Math.random();
            area[i] = rects[i].width * rects[i].height;
            System.out.println("rect" + i);
            System.out.println("width: " + rects[i].width );
            System.out.println("height: " + rects[i].height );
            System.out.println("area: " + area[i] );
        }
        // ...(2) end
    }
}
```

Hasil:

```
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> javac *.java
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> java TestRectangle
rect0
width: 0.6002669887657877
height: 0.7755014716723815
area: 0.4655079331842172
rect1
width: 0.6922912686904813
height: 0.16051277986406143
area: 0.11112159601312703
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2>
```

3) Array menyimpan 10 objek Rectangle

```
public class TestRectangle {
    public static void main(String[] args) {
        // (3) start...
        Rectangle[] rects = new Rectangle[10];
        double[] area = new double[10];
        for (int i=0; i<10; i++){
            rects[i] = new Rectangle();
            rects[i].width = Math.random();
            rects[i].height = Math.random();
            area[i] = rects[i].width * rects[i].height;
            System.out.println("rect" + i);
            System.out.println("width: " + rects[i].width );
            System.out.println("height: " + rects[i].height );
            System.out.println("area: " + area[i] );
        }
        // ...(3) end
    }
}
```

Hasil:

```
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> java TestRectangle
rect0
width: 0.8034721408809716
height: 0.022550834432870093
area: 0.018118967220430465
rect1
width: 0.18215525906531005
height: 0.903595535848988
area: 0.16459467892283006
rect2
width: 0.9757682125562351
height: 0.1771692503670924
area: 0.17287612275062586
rect3
width: 0.895675527934233
height: 0.2684172477500235
area: 0.24041476008515614
rect4
width: 0.07555785119531344
height: 0.35070158404087737
area: 0.026498258100921324
rect5
width: 0.5388553991233377
height: 0.9008003931857789
area: 0.4854011554005824
rect6
width: 0.7324877764373479
height: 0.4742679696440132
area: 0.3473954905199988
rect7
width: 0.13300727220936515
height: 0.6097865411696576
area: 0.0811060444709599
rect8
width: 0.45948374858479557
height: 0.2671637922145753
area: 0.12275742073288248
rect9
width: 0.3954653196901352
height: 0.04570468475807499
area: 0.018074617769188974
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2>
```

4) Mengeluarkan output informasi Rectangle terbesar dan terkecil

```java
public class TestRectangle {
    public static void main(String[] args) {
        // (4) start...
        Rectangle[] rects = new Rectangle[10];
        double[] area = new double[10];
        for (int i=0; i<10; i++){
            rects[i] = new Rectangle();
            rects[i].width = Math.random();
            rects[i].height = Math.random();
            area[i] = rects[i].width * rects[i].height;
        }
```

```
        Rectangle maxRect = new Rectangle();
        Rectangle minRect = new Rectangle();
        maxRect = rects[0];
        minRect = rects[0];

        for (int i=0; i<10; i++){
            if(area[i] > maxRect.width*maxRect.height){
                maxRect = rects[i];
            }
            if(area[i] < minRect.width*minRect.height){
                minRect = rects[i];
            }
        }
        System.out.println("rect" + " terbesar");
        System.out.println("width: " + maxRect.width );
        System.out.println("height: " + maxRect.height );
        System.out.println("area: " + maxRect.width*maxRect.height );
        System.out.println("rect" + " terkecil");
        System.out.println("width: " + minRect.width );
        System.out.println("height: " + minRect.height );
        System.out.println("area: " + minRect.width*minRect.height );
        // ...(4) end
    }
}
```

Hasil:

```
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> javac *.java
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> java TestRectangle
rect terbesar
width: 0.8999891444034006
height: 0.8642525271840971
area: 0.7778178924888922
rect terkecil
width: 0.3993147299728299
height: 0.03340593245007273
area: 0.013339480895791388
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2>
```

2. Buku
   - Code Buku.java

```
public class Buku {
    String judul;
    String penulis;
    int harga;
}
```

- Code TectBook.java

```
public class TestBook {
    public static void main(String[] args) {
        // membuat array yang menyimpan 3 instance Buku
        Buku[] buku = new Buku[3];
        buku[0] = new Buku();
        buku[0].judul = "Introduction to Java Programming and Data
Structures";
        buku[0].penulis = "Daniel Liang";
        buku[0].harga = 355000;
        buku[1] = new Buku();
        buku[1].judul = "Advanced Java Programming";
        buku[1].penulis = "Uttam Roy";
        buku[1].harga = 236250;
        buku[2] = new Buku();
        buku[2].judul = "Practical Java Programming";
        buku[2].penulis = "Perry Xiao";
        buku[2].harga = 95000;

        // menghitung harga total termasuk pajak 10% lalu disimpan ke
array hargaTotal
        int[] hargaTotal = new int[3];
        for(int i=0; i<3; i++){
            hargaTotal[i] = buku[i].harga * 110/100;
        }

        // menampilkan infromasi ter-update (judul, penulis, dan harga
total)
        for(int i=0; i<3; i++){
            System.out.println("Judul: " + buku[i].judul);
            System.out.println("Penulis: " + buku[i].penulis);
            System.out.println("Harga Total (pajak 10%): Rp" +
hargaTotal[i]);
            System.out.println();
        }
    }
}
```

Hasil:

```
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> java TestBook
Judul: Introduction to Java Programming and Data Structures
Penulis: Daniel Liang
Harga Total (pajak 10%): Rp390500

Judul: Advanced Java Programming
Penulis: Uttam Roy
Harga Total (pajak 10%): Rp259875

Judul: Practical Java Programming
Penulis: Perry Xiao
Harga Total (pajak 10%): Rp104500

PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2>
```

3. Line Length
   - Code Point.java

```java
public class Point {
    int x;
    int y;
}
```

   - Code Line.java

```java
public class Line {
    Point p0;
    Point p1;
}
```

   - Code LineLength.java

```java
public class LineLength {
    public static void main(String[] args) {
        Line line = new Line();
        line.p0 = new Point();
        line.p0.x = 5;
        // (task 1)
        line.p0.y = 4;
        line.p1 = new Point();
        line.p1.x = 13;
        line.p1.y = 9;

        double d;
        // (task 2)
```

```
        d = Math.sqrt((line.p1.x-line.p0.x)*(line.p1.x-line.p0.x)
                    + (line.p1.y-line.p0.y)*(line.p1.y-line.p0.y)
            );
        System.out.println("the legth of the line is " + d);
    }
}
```

Hasil:

```
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2> java LineLength
the legth of the line is 9.433981132056603
PS D:\Kuliah\Semester 2\Praktikum ASD\homework\homework2>
```