Dokumentasi Praktikum PBO 8

Mata Kuliah	:	PBO - TI - S1
Pertemuan	:	8
NIM	:	A11.2021.13254
Nama	:	Yohanes Dimas Pratama

Contoh Program Polymorphism

Hasil Program:

```
cd "c:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi
Objek\8\Praktikum 8\" ; if ($?) { javac BalokDemo.java } ; if ($?) { java B
alokDemo }
Panjang : 10.0
Lebar   : 5.0
Luas    : 50.0
Tinggi  : 5.0
Volume  : 250.0

Balok   : Balok
Panjang : 10.0
Lebar   : 7.0
Luas    : 70.0
Tinggi  : 5.0
Volume  : 350.0
PS C:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi O
bjek\8\Praktikum 8>
```

Code Program:

*Balok.java

```java
public class Balok extends PersegiPanjang {
    double t, volume;
    void hitungVolume(){
        volume = luas * t;
    }
    void cetak(){
        super.cetak();
        System.out.println("Tinggi\t: " + t);
        System.out.println("Volume\t: " + volume);
    }
    void cetak(String nama){
        System.out.println("Balok\t: " + nama);
        cetak();
    }
}
```

*BalokDemo.java

```java
public class BalokDemo {
    public static void main(String[] args) {
        Balok a = new Balok();
        a.p = 10;
        a.l = 5;
        a.t = 5;
        a.hitungLuas();
        a.hitungVolume();
        a.cetak();
        System.out.println("");
        a.l = 7;
        a.hitungLuas();
        a.hitungVolume();
        a.cetak("Balok");
    }
}
```

Latihan 1

Hasil Program:

```
PS C:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi O
bjek\8\Praktikum 8> cd "c:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemro
graman Berorientasi Objek\8\Praktikum 8\" ; if ($?) { javac MatematikaDemo.
java } ; if ($?) { java MatematikaDemo }
Operasi Pertambahan 10 + 5
Hasil tambah: 15
Hasil tambah: 17
Hasil tambah: 41.2
Hasil tambah: 55.400000000000006

Operasi Pengurangan 10 - 5
Hasil kurang: 5
Hasil kurang: 3
Hasil kurang: -16.2
Hasil kurang: -30.4

Operasi Perkalian 10 * 5
Hasil kali: 50
Hasil kali: 100
Hasil kali: 358.75
Hasil kali: 5094.25

Operasi Pembagian 10 / 5
Hasil bagi: 2
Hasil bagi: 1
Hasil bagi: 0.43554005
Hasil bagi: 0.03067183589340924
PS C:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi O
bjek\8\Praktikum 8>
```

Code Program:

*Matematika.java

```java
public class Matematika {
    double hasildouble;
    int hasilint;
```

```
    void tambah(int a, int b) {
        hasilint = a + b;
        System.out.println("Hasil tambah: " + hasilint);
    }
    int tambah(int a, int b, int c) {
        hasilint = a + b + c;
        return hasilint;
    }
    float tambah(float a, float b) {
        return a+b;
    }
    double tambah(double a, double b, double c) {
        return a+b+c;
    }

    void kurang(int a, int b) {
        hasilint = a - b;
        System.out.println("Hasil kurang: " + hasilint);
    }
    int kurang(int a, int b, int c) {
        hasilint = a - b - c;
        return hasilint;
    }
    float kurang(float a, float b) {
        return a-b;
    }
    double kurang(double a, double b, double c) {
        return a-b-c;
    }

    void kali(int a, int b) {
        hasilint = a * b;
        System.out.println("Hasil kali: " + hasilint);
    }
    int kali(int a, int b, int c) {
        hasilint = a * b * c;
        return hasilint;
    }
    float kali(float a, float b) {
        return a*b;
    }
    double kali(double a, double b, double c) {
        return a*b*c;
    }

    void bagi(int a, int b) {
        hasilint = a / b;
        System.out.println("Hasil bagi: " + hasilint);
```

```
    }
    int bagi(int a, int b, int c) {
        hasilint = a / b / c;
        return hasilint;
    }
    float bagi(float a, float b) {
        return a/b;
    }
    double bagi(double a, double b, double c) {
        return a/b/c;
    }
}
```

*MatematikaDemo.java

```
public class MatematikaDemo {
    public static void main(String[] args) {
        int angka1 = 10;
        int angka2 = 5;
        int angka3 = 2;

        Matematika hitung = new Matematika();

        System.out.println("Operasi Pertambahan " + angka1 + " + " + angka2);
        hitung.tambah(angka1, angka2);
        System.out.println("Hasil tambah: " + hitung.tambah(angka1, angka2,
angka3));
        System.out.println("Hasil tambah: " + hitung.tambah(12.5f, 28.7f));
        System.out.println("Hasil tambah: " + hitung.tambah(12.5, 28.7,
14.2));
        System.out.println();

        System.out.println("Operasi Pengurangan " + angka1 + " - " + angka2);

        hitung.kurang(angka1, angka2);
        System.out.println("Hasil kurang: " + hitung.kurang(angka1, angka2,
angka3));
        System.out.println("Hasil kurang: " + hitung.kurang(12.5f, 28.7f));
        System.out.println("Hasil kurang: " + hitung.kurang(12.5, 28.7,
14.2));
        System.out.println();

        System.out.println("Operasi Perkalian " + angka1 + " * " + angka2);
        hitung.kali(angka1, angka2);
        System.out.println("Hasil kali: " + hitung.kali(angka1, angka2,
angka3));
        System.out.println("Hasil kali: " + hitung.kali(12.5f, 28.7f));
        System.out.println("Hasil kali: " + hitung.kali(12.5, 28.7, 14.2));
```

```
        System.out.println();

        System.out.println("Operasi Pembagian " + angka1 + " / " + angka2);
        hitung.bagi(angka1, angka2);
        System.out.println("Hasil bagi: " + hitung.bagi(angka1, angka2,
angka3));
        System.out.println("Hasil bagi: " + hitung.bagi(12.5f, 28.7f));
        System.out.println("Hasil bagi: " + hitung.bagi(12.5, 28.7, 14.2));
    }
}
```

Latihan 2

Hasil Program:

```
PS C:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi O
bjek\8\Praktikum 8> cd "c:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemro
graman Berorientasi Objek\8\Praktikum 8\" ; if ($?) { javac TestPesawat.jav
a } ; if ($?) { java TestPesawat }
Pesawat di hangar 1 ready...
Pesawat di hangar 1 ready...
Ini adalah pesawat tempur...
...airbus...
Pesawat akan terbang...
Pesawat akan mendarat...
...f16...
Pesawat tempur akan melakukan manuver...
Pesawat akan terbang...
Pesawat tempur akan terbang...
PS C:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi O
bjek\8\Praktikum 8>
```

Code Program:

*Pesawat.java

```
public class Pesawat {
    int sayap, ekor;
    Pesawat(){
        System.out.println("Pesawat di hangar 1 ready...");
    }
    void terbang(){
        System.out.println("Pesawat akan terbang...");
    }
    void mendarat(){
        System.out.println("Pesawat akan mendarat...");
    }
}
```

*PesawatTempur.java

```java
public class PesawatTempur extends Pesawat{
    PesawatTempur(){
        System.out.println("Ini adalah pesawat tempur...");
    }
    void manuver(){
        System.out.println("Pesawat tempur akan melakukan manuver...");
    }
    void terbang(){
        super.terbang();
        System.out.println("Pesawat tempur akan terbang...");
    }
}
```

*TestPesawat.java

```java
public class TestPesawat {
    public static void main(String[] args) {
        Pesawat garuda = new Pesawat();
        PesawatTempur raptor = new PesawatTempur();
        System.out.println("...airbus...");
        garuda.terbang();
        garuda.mendarat();
        System.out.println("...f16...");
        raptor.manuver();
        raptor.terbang();

    }
}
```

Latihan 3

Hasil Program:

```
PS C:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi O
bjek\8\Praktikum 8> cd "c:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemro
graman Berorientasi Objek\8\Praktikum 8\" ; if ($?) { javac TestHewan.java
} ; if ($?) { java TestHewan }
Pilih hewan yang ingin anda ketahui informasinya:
1. Singa
2. Elang
3. Lebah
4. Paus
5. Keluar
Masukkan pilihan anda: 3
Hewan ini berjenis serangga
Ciri-ciri hewan ini berbadan kecil
Hewan ini suaranya berbunyi bzzzzzz
Hewan ini berjalan dengan terbang
Hewan ini bernapas dengan trakea
PS C:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi O
bjek\8\Praktikum 8>
```

Code Program:

*Hewan.java

```
public class Hewan {
    String jenis, ciri;
    void suara(){
        System.out.print("Hewan ini suaranya berbunyi ");
    };
    void berjalan(){
        System.out.print("Hewan ini berjalan dengan ");
    };
    void bernapas(){
        System.out.print("Hewan ini bernapas dengan ");
    };

    class Singa extends Hewan {
        void suara(){
            super.suara();
            System.out.println("roarrrr");
        }
        void berjalan(){
            super.berjalan();
            System.out.println("berlari");
        }
        void bernapas(){
            super.bernapas();
            System.out.println("paru-paru");
        }
    }

    class Elang extends Hewan {
        void suara(){
            super.suara();
            System.out.println("kiiiiii");
        }
        void berjalan(){
            super.berjalan();
            System.out.println("terbang");
        }
        void bernapas(){
            super.bernapas();
            System.out.println("paru-paru");
        }
    }

    class Lebah extends Hewan {
        void suara(){
            super.suara();
            System.out.println("bzzzzzz");
        }
```

```
        void berjalan(){
            super.berjalan();
            System.out.println("terbang");
        }
        void bernapas(){
            super.bernapas();
            System.out.println("trakea");
        }
    }

    class Paus extends Hewan {
        void suara(){
            super.suara();
            System.out.println("eeeeeee");
        }
        void berjalan(){
            super.berjalan();
            System.out.println("berenang");
        }
        void bernapas(){
            super.bernapas();
            System.out.println("paru-paru");
        }
    }
}
```

*TestHewan.java

```
import java.util.Scanner;

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

        int menu;
        System.out.println("Pilih hewan yang ingin anda ketahui
informasinya:");
        System.out.println("1. Singa");
        System.out.println("2. Elang");
        System.out.println("3. Lebah");
        System.out.println("4. Paus");
        System.out.println("5. Keluar");
        System.out.print("Masukkan pilihan anda: ");
        menu = input.nextInt();

        switch (menu) {
            case 1:
                Hewan.Singa singa = new Hewan().new Singa();
```

```
                singa.jenis = "mamalia";
                singa.ciri = "berbulu";
                System.out.println("Hewan ini berjenis " + singa.jenis);
                System.out.println("Ciri-ciri hewan ini " + singa.ciri);
                singa.suara();
                singa.berjalan();
                singa.bernapas();
                break;
            case 2:
                Hewan.Elang elang = new Hewan().new Elang();
                elang.jenis = "burung";
                elang.ciri = "berparuh";
                System.out.println("Hewan ini berjenis " + elang.jenis);
                System.out.println("Ciri-ciri hewan ini " + elang.ciri);
                elang.suara();
                elang.berjalan();
                elang.bernapas();
                break;
            case 3:
                Hewan.Lebah lebah = new Hewan().new Lebah();
                lebah.jenis = "serangga";
                lebah.ciri = "berbadan kecil";
                System.out.println("Hewan ini berjenis " + lebah.jenis);
                System.out.println("Ciri-ciri hewan ini " + lebah.ciri);
                lebah.suara();
                lebah.berjalan();
                lebah.bernapas();
                break;
            case 4:
                Hewan.Paus paus = new Hewan().new Paus();
                paus.jenis = "mamalia";
                paus.ciri = "berbadan besar";
                System.out.println("Hewan ini berjenis " + paus.jenis);
                System.out.println("Ciri-ciri hewan ini " + paus.ciri);
                paus.suara();
                paus.berjalan();
                paus.bernapas();
                break;
            case 5:
                System.out.println("Terima kasih!");
                break;
        }
    }
}
```

Latihan 4

Hasil Program:

```
PS C:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemrograman Berorientasi O
bjek\8\Praktikum 8> cd "c:\Users\LENOVO\OneDrive\Documents\Semester-4\Pemro
graman Berorientasi Objek\8\Praktikum 8\" ; if ($?) { javac TestShape.java
} ; if ($?) { java TestShape }
Welcome to our shape program:
1. Circle
2. Rectangle
3. Square
4. Exit
Insert menu: 2
Pick color: Purple
Fill the shape? (true/false): true
Input length: 50
Input width: 20
Shape Color     : Purple
Shape Filled    : true
Shape Area      : 1000.0
Shape Perimeter : 140.0
```

Code Program:

*Shape.java

```java
public class Shape {
    String color = "red";
    boolean filled = true;

    Shape() {
    }

    Shape(String color, boolean filled) {
        this.color = color;
        this.filled = filled;
    }

    String getColor() {
        return color;
    }

    void setColor(String color) {
        this.color = color;
    }

    boolean isFilled() {
        return filled;
    }

    void setFilled(boolean filled) {
        this.filled = filled;
    }

    public String toString() {
```

```
        return "Shape Color\t: " + color + "\nShape Filled\t: " + filled +
"\n";
    }
}

class Circle extends Shape {
    private double radius = 1.0;

    Circle() {
    }

    Circle(double radius) {
        this.radius = radius;
    }

    Circle(double radius, String color, boolean filled) {
        super(color, filled);
        this.radius = radius;
    }

    public double getRadius() {
        return radius;
    }

    public void setRadius(double radius) {
        this.radius = radius;
    }

    public double getArea() {
        return (3.14 * Math.pow(radius, 2));
    }

    public double getPerimeter() {
        return (2 * 3.14 * radius);
    }

    @Override
    public String toString() {
        return super.toString() + "Shape Radius\t: " + radius + "\nShape
Area\t: " + getArea() + "\nShape Perimeter\t: " + getPerimeter();
    }
}

class Rectangle extends Shape {
    private double width = 1.0;
    private double length = 1.0;

    Rectangle() {
```

```
    }

    Rectangle(double width, double length) {
        this.width = width;
        this.length = length;
    }

    Rectangle(double width, double length, String color, boolean filled) {
        super(color, filled);
        this.width = width;
        this.length = length;
    }

    public double getWidth() {
        return width;
    }

    public void setWidth(double width) {
        this.width = width;
    }

    public double getLength() {
        return length;
    }

    public void setLength(double length) {
        this.length = length;
    }

    public double getArea() {
        return (width * length);
    }

    public double getPerimeter() {
        return ((width + length) * 2);
    }

    @Override
    public String toString() {
        return super.toString() + "Shape Area\t: " + getArea() + "\nShape
Perimeter\t: " + getPerimeter() + "\n";
    }
}

class Square extends Rectangle {
    Square() {}

    Square(double side) {
```

```
        super(side, side);
    }

    Square(double side, String color, boolean filled) {
        super(side, side, color, filled);
    }

    public double getSide() {
        return getWidth();
    }

    public void setSide(double side) {
        setWidth(side);
        setLength(side);
    }

    @Override
    public void setWidth(double side) {
        super.setWidth(side);
    }

    @Override
    public void setLength(double side) {
        super.setLength(side);
    }

    @Override
    public String toString() {
        return super.toString() + "Shape Side\t: " + getSide() + "\n";
    }
}
```

TestShape.java

```
import java.util.Scanner;
import java.io.*;

public class TestShape {
    public static void main(String[] args) throws IOException {
        Scanner input = new Scanner(System.in);
        int menu = 0;
        String colorShape;
        boolean fillShape;
        while (menu != 4) {
            System.out.println("Welcome to our shape program:");
            System.out.println("1. Circle");
            System.out.println("2. Rectangle");
            System.out.println("3. Square");
```

```
            System.out.println("4. Exit");
            System.out.print("Insert menu: ");
            menu = input.nextInt();

            switch (menu) {
                case 1:
                    System.out.print("Pick color: ");
                    colorShape = input.next();
                    System.out.print("Fill the shape? (true/false): ");
                    fillShape = input.nextBoolean();
                    System.out.print("Input radius: ");
                    double radius = input.nextDouble();
                    Shape circle = new Circle(radius, colorShape, fillShape);
                    System.out.println(circle.toString());
                    break;
                case 2:
                    System.out.print("Pick color: ");
                    colorShape = input.next();
                    System.out.print("Fill the shape? (true/false): ");
                    fillShape = input.nextBoolean();
                    System.out.print("Input length: ");
                    double length = input.nextDouble();
                    System.out.print("Input width: ");
                    double width = input.nextDouble();
                    Shape rectangle = new Rectangle(length, width, colorShape,
fillShape);
                    System.out.println(rectangle.toString());
                    break;
                case 3:
                    System.out.print("Pick color: ");
                    colorShape = input.next();
                    System.out.print("Fill the shape? (true/false): ");
                    fillShape = input.nextBoolean();
                    System.out.print("Input side length: ");
                    double side = input.nextDouble();
                    Shape square = new Square(side, colorShape, fillShape);
                    System.out.println(square.toString());
                    break;
                case 4:
                    System.out.println("Thanks for using our programs, see you
again!");
                    break;
            }
        }
    }
}
```