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PRAKTIKUM 8

Polymorphism

PersegiPanjang.java

```
PersegiPanjang.java X
PersegiPanjang.java > PersegiPanjang
1 public class PersegiPanjang{
2     double p, l, luas;
3     void hitungLuas(){
4         luas = p*l;
5     }
6     void cetak(){
7         System.out.println("Panjang\t: " + p);
8         System.out.println("Lebar\t: " + l);
9         System.out.println("Luas\t: " + luas);
10    }
11 }
```

Balok.java

```
Balok.java X
Balok.java > Balok
1 public class Balok extends PersegiPanjang {
2     double t, volume;
3
4     void hitungVolume() {
5         volume = luas * t;
6     }
7
8     void cetak() {
9         super.cetak();
10        System.out.println("Tinggi\t: " + t);
11        System.out.println("Volume\t: " + volume);
12    }
13
14    void cetak(String nama) {
15        System.out.println("Balok\t: " + nama);
16        cetak();
17    }
18 }
19
```

BalokDemo.java

```
BalokDemo.java X
BalokDemo.java > BalokDemo
1 public class BalokDemo {
    Run | Debug
2     public static void main(String[] args) {
3         Balok b = new Balok();
4         b.p = 10;
5         b.l = 5;
6         b.t = 5;
7         b.hitungLuas();
8         b.hitungVolume();
9         b.cetak();
10
11         System.out.println(x: " ");
12         b.l = 7;
13         b.hitungLuas();
14         b.hitungVolume();
15         b.cetak(nama: "Balokku");
16     }
17 }
18
```

Output

```
Windows PowerShell X + v
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> javac BalokDemo.java
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> java BalokDemo
Panjang : 10.0
Lebar : 5.0
Luas : 50.0
Tinggi : 5.0
Volume : 250.0

Balok : Balokku
Panjang : 10.0
Lebar : 7.0
Luas : 70.0
Tinggi : 5.0
Volume : 350.0
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> |
```

Latihan 1

Matematika.java

```
Matematika.java > ...
1  public class Matematika {
3      float hasil;
4      float a, b;
5
6      public Matematika(float a, float b) {
7          this.a = a;
8          this.b = b;
9      }
10
11     public Matematika() {
12     }
13
14     void pertambahan() {
15         hasil = a + b;
16         System.out.println("Hasil Pertambahan: " + a + " + " + b + " = " + hasil);
17     }
18
19     void pengurangan() {
20         hasil = a - b;
21         System.out.println("Hasil Pengurangan: " + a + " - " + b + " = " + hasil);
22     }
23
24     void perkalian() {
25         hasil = a * b;
26         System.out.println("Hasil Perkalian: " + a + " x " + b + " = " + hasil);
27     }
28
29     void pembagian() {
30         hasil = a / b;
31         System.out.println("Hasil Pembagian: " + a + " : " + b + " = " + hasil);
32     }
33
34     double pertambahan(double a, double b, double c) {
35         return a + b + c;
36     }
37
38     double pengurangan(double a, double b, double c) {
39         return a - b - c;
40     }
41
42     double perkalian(double a, double b, double c) {
43         return a * b * c;
44     }
45
46     double pembagian(double a, double b, double c) {
47         return a / b / c;
48     }
}
```

MatematikaDemo.java



```
MatematikaDemo.java > ...
1  public class MatematikaDemo {
    Run | Debug
2      public static void main(String[] args) {
3
4          Matematika hitung = new Matematika();
5          double hsl;
6          hitung.a = 99;
7          hitung.b = 7;
8          hitung.pertambahan();
9          hitung.pengurangan();
10         hitung.perkalian();
11         hitung.pembagian();
12
13         System.out.println(x: "-----");
14
15         double a = 12.5, b = 28.7, c = 14.2;
16         hsl = hitung.pertambahan(a, b, c);
17         System.out.println("Hasil Pertambahan " + a + " + " + b + " + " + c + " = " + hsl);
18         hsl = hitung.pengurangan(a, b, c);
19         System.out.println("Hasil Pengurangan " + a + " + " + b + " + " + c + " = " + hsl);
20         hsl = hitung.perkalian(a, b, c);
21         System.out.println("Hasil Perkalian " + a + " x " + b + " x " + c + " = " + hsl);
22         hsl = hitung.pembagian(a, b, c);
23         System.out.println("Hasil Pembagian " + a + " + " + b + " + " + c + " = " + hsl);
24
25     }
26 }
```

Output

```
Windows PowerShell
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> javac .\MatematikaDemo.java
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> java MatematikaDemo
Hasil Pertambahan: 99.0 + 7.0 = 106.0
Hasil Pengurangan: 99.0 - 7.0 = 92.0
Hasil Perkalian: 99.0 x 7.0 = 693.0
Hasil Pembagian: 99.0 : 7.0 = 14.142858
-----
Hasil Pertambahan 12.5 + 28.7 + 14.2 = 55.400000000000006
Hasil Pengurangan 12.5 + 28.7 + 14.2 = -30.4
Hasil Perkalian 12.5 x 28.7 x 14.2 = 5094.25
Hasil Pembagian 12.5 + 28.7 + 14.2 = 0.03067183589340924
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> |
```



Latihan 2

Pesawat.java

 Pesawat.java >  Pesawat

```
1  public class Pesawat {
2      public int sayap = 2;
3      public int ekor = 1;
4
5      public Pesawat() {
6          System.out.println(x:"object Pesawat dibuat.....");
7      }
8
9      public void terbang() {
10         System.out.println(x:"Terbang.....");
11     }
12
13     public void mendarat() {
14         System.out.println(x:"Mendarat.....");
15     }
16 }
```

PesawatTempur.java

 PesawatTempur.java >  PesawatTempur

```
1  public class PesawatTempur extends Pesawat {
2      public PesawatTempur() {
3          System.out.println(x:"object pesawat tempur dibuat.....");
4      }
5
6      public void manuver() {
7          System.out.println(x:"Manuver.....");
8      }
9
10     public void terbang() {
11         super.terbang();
12         System.out.println(x:"Terbang ala tempur.....");
13     }
14 }
```

TestPesawat.java

```
TestPesawat.java > TestPesawat
1  public class TestPesawat {
    Run | Debug
2      public static void main(String[] args) {
3          Pesawat airbus = new Pesawat();
4          PesawatTempur f16 = new PesawatTempur();
5
6          System.out.println(x:"...airbus...");
7          airbus.terbang();
8          airbus.mendarat();
9
10         System.out.println(x:"...f16...");
11         f16.terbang();
12         f16.mendarat();
13         f16.manuver();
14     }
15 }
```

Output

```
Windows PowerShell
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> javac .\TestPesawat.java
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> java TestPesawat
object Pesawat dibuat.....
object Pesawat dibuat.....
object pesawat tempur dibuat.....
...airbus...
Terbang.....
Mendarat.....
...f16...
Terbang.....
Terbang ala tempur.....
Mendarat.....
Manuver.....
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> |
```

Latihan Overriding

Hewan.java

```
Hewan.java > ...
1  public class Hewan {
2      String jenis, ciri;
3
4      Hewan() {
5      };
6
7      Hewan(String jenis, String ciri) {
8          this.jenis = jenis;
9          this.ciri = ciri;
10     }
11
12     public void suara() {
13         System.out.println(x:"Suara hewan");
14     }
15
16     public void berjalan() {
17         System.out.println(x:"Cara berjalan hewan");
18     }
19
20     public void bernafas() {
21         System.out.println(x:"Cara bernafas hewan");
22     }
23 }
```

Singa.java

```
Singa.java > ...
1  public class Singa extends Hewan {
2      public Singa(String jenis, String ciri){
3          super(jenis,ciri);
4      }
5
6      @Override
7      public void suara() {
8          System.out.println(x:"Suara\t: Rawrrrrr");
9      }
10
11     @Override
12     public void berjalan() {
13         System.out.println(x:"Singa Berjalan dengan empat kaki");
14     }
15
16     @Override
17     public void bernafas() {
18         System.out.println(x:"Singa bernafas menggunakan paru-Paru");
19     }
20 }
```

Elang.java

Elang.java > ...

```
1  public class Elang extends Hewan {
2      Elang(String jenis, String ciri) {
3          super(jenis, ciri);
4      }
5
6      @Override
7      public void suara() {
8          System.out.println(x:"Suara\t: Cieeeettt");
9      }
10
11     public void berjalan() {
12         System.out.println(x:"Elang berjalan dengan dua kaki");
13     }
14
15     public void bernafas() {
16         System.out.println(x:"Elang bernafas menggunakan paru-paru");
17     }
18 }
19
```

Lebah.java

Lebah.java > Lebah

```
1  public class Lebah extends Hewan {
2      Lebah(String jenis, String ciri) {
3          super(jenis, ciri);
4      }
5
6      @Override
7      public void suara() {
8          System.out.println(x:"Suara\t: Ngingngng");
9      }
10
11     public void berjalan() {
12         System.out.println(x:"Lebah terbang");
13     }
14
15     public void bernafas() {
16         System.out.println(x:"Lebah bernafas menggunakan trakea");
17     }
18 }
19
```


Paus.java

Paus.java > ...

```
1 public class Paus extends Hewan {
2     public Paus(String jenis, String ciri){
3         super(jenis,ciri);
4     }
5
6     @Override
7     public void suara() {
8         System.out.println(x:"Suara\t: Wuusssshhhhh");
9     }
10
11    @Override
12    public void berjalan() {
13        System.out.println(x:"Paus berenang");
14    }
15
16    @Override
17    public void bernafas() {
18        System.out.println(x:"Paus bernafas menggunakan insang");
19    }
20 }
21
```

TestHewan.java

```
TestHewan.java > TestHewan > main(String[])
1  import java.util.Scanner;
2
3  public class TestHewan {
    Run | Debug
4      public static void main(String[] args) {
5          Scanner input = new Scanner(System.in);
6
7          Hewan singa = new Singa(string:"Mamalia", string2:"Berbulu tebal");
8          Hewan elang = new Elang(string:"Burung", string2:"Memiliki sayap lebar");
9          Hewan lebah = new Lebah(string:"Serangga", string2:"Memiliki sengat");
10         Hewan paus = new Paus(string:"Mamalia laut", string2:"Berukuran besar");
11
12         while (true) {
13             System.out.println(x:"Pilihan Hewan : ");
14             System.out.println(x:"1. Singa");
15             System.out.println(x:"2. Elang");
16             System.out.println(x:"3. Lebah");
17             System.out.println(x:"4. Paus");
18             System.out.println(x:"5. Keluar");
19             System.out.print(s:"Pilihan Anda [1-5]: ");
20             int choose = input.nextInt();
21             switch (choose) {
22                 case 1:
23                     System.out.println(x:"Info Singa:");
24                     System.out.println("Jenis\t: " + singa.jenis);
25                     System.out.println("Ciri\t: " + singa.ciri);
26                     singa.suara();
27                     singa.berjalan();
28                     singa.bernafas();
29                     break;
30                 case 2:
31                     System.out.println(x:"Info Elang:");
32                     System.out.println("Jenis\t: " + elang.jenis);
33                     System.out.println("Ciri\t: " + elang.ciri);
34                     elang.suara();
35                     elang.berjalan();
36                     elang.bernafas();
37                     break;
38                 case 3:
39                     System.out.println(x:"Info Lebah:");
40                     System.out.println("Jenis\t: " + lebah.jenis);
41                     System.out.println("Ciri\t: " + lebah.ciri);
42                     lebah.suara();
43                     lebah.berjalan();
44                     lebah.bernafas();
45                     break;
```

```

46         case 4:
47             System.out.println(x:"Info Paus:");
48             System.out.println("Jenis\t: " + paus.jenis);
49             System.out.println("Ciri\t: " + paus.ciri);
50             paus.suara();
51             paus.berjalan();
52             paus.bernafas();
53             break;
54         case 5:
55             System.out.println(x:"Terima kasih! Program selesai.");
56             input.close();
57             System.exit(status:0);
58         default:
59             System.out.println(x:"Pilihan tidak valid, silakan pilih lagi.");
60     }
61 }
62 }
63 }

```

Output

```

Windows PowerShell
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> javac .\TestHewan.java
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> java TestHewan
Pilihan Hewan :
1. Singa
2. Elang
3. Lebah
4. Paus
5. Keluar
Pilihan Anda [1-5]: 1
Info Singa:
Jenis   : Mamalia
Ciri    : Berbulu tebal
Suara   : Raaawrrrr
Singa berjalan dengan empat kaki
Singa bernafas menggunakan paru-paru
Pilihan Hewan :
1. Singa
2. Elang
3. Lebah
4. Paus
5. Keluar
Pilihan Anda [1-5]: 5
Terima kasih! Program selesai.
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> |

```

Latihan 3

Shape.java

```
Shape.java > Shape
1  public class Shape {
2      String color = "red";
3      boolean filled = true;
4
5      Shape() {
6      }
7
8      Shape(String color, boolean filled) {
9          this.color = color;
10         this.filled = filled;
11     }
12
13     public String getColor() {
14         return color;
15     }
16
17     public void setColor(String color) {
18         this.color = color;
19     }
20
21     public boolean isFilled() {
22         return filled;
23     }
24
25     public void setFilled(boolean filled) {
26         this.filled = filled;
27     }
28
29     @Override
30     public String toString() {
31         return super.toString();
32     }
33 }
```

Circle.java

```
Circle.java > Circle
1  class Circle extends Shape {
2      double radius = 1.0;
3
4      Circle() {
5      }
6
7      Circle(double radius) {
8          this.radius = radius;
9      }
10
11     Circle(double radius, String color, boolean filled) {
12         this.radius = radius;
13         this.color = color;
14         this.filled = filled;
15     }
16
17     public double getRadius() {
18         return radius;
19     }
20
21     public void setRadius(double radius) {
22         this.radius = radius;
23     }
24
25     public double getArea() {
26         return radius * 2;
27     }
28
29     public double getPerimeter() {
30         return radius * radius;
31     }
32
33     @Override
34     public String toString() {
35         return super.toString();
36     }
37 }
```

Rectangle.java

Rectangle.java > ...

```
1  class Rectangle extends Shape {
2      double width = 1.0;
3      double length = 1.0;
4
5      Rectangle() {
6      }
7
8      Rectangle(double width, double length) {
9          this.width = width;
10         this.length = length;
11     }
12
13     Rectangle(double width, double length, String color, boolean filled) {
14         this.width = width;
15         this.length = length;
16         this.color = color;
17         this.filled = filled;
18     }
19
20     public double getWidth() {
21         return width;
22     }
23
24     public void setWidth(double width) {
25         this.width = width;
26     }
27
28     public double getLength() {
29         return length;
30     }
31
32     public void setLength(double length) {
33         this.length = length;
34     }
35
36     public double getArea() {
37         return width * length;
38     }
39
40     public double getPerimeter() {
41         return width * length * 2;
42     }
43
44     @Override
45     public String toString() {
46         return super.toString();
47     }
48 }
```

Square.java

🔍 Square.java > ...

```
1  class Square extends Rectangle {
2      public Square() {
3      }
4
5      public Square(double side) {
6          super(side, side);
7      }
8
9      public Square(double side, String color, boolean filled) {
10         super(side, side, color, filled);
11     }
12
13     public double getSide(){
14         return super.getLength();
15     }
16
17     public void setSide(double side){
18         super.setLength(side);
19         super.setWidth(side);
20     }
21
22     public void setWidth(double side){
23         super.setWidth(side);
24     }
25
26     public void setLength(double side){
27         super.setLength(side);
28     }
29
30     public String toString(){
31         return super.toString();
32     }
33 }
```

TestShapes.java

```
TestShapes.java > TestShapes > main(String[])
1 public class TestShapes {
    Run | Debug
2     public static void main(String[] args) {
3         Rectangle rectangle = new Rectangle(width:4.0, length:6.0, color:"Merah", filled:true);
4
5         System.out.println(x:"----- Rectangle -----");
6         System.out.println("Warna: " + rectangle.getColor());
7         System.out.println("Tinggi: " + rectangle.getLength());
8         System.out.println("Lebar: " + rectangle.getWidth());
9         System.out.println("Luas: " + rectangle.getArea());
10        System.out.println();
11
12        Circle circle = new Circle(radius:3.0, color:"Biru", filled:true);
13
14        System.out.println(x:"----- Circle -----");
15        System.out.println("Warna: " + circle.getColor());
16        System.out.println("Radius: " + circle.getRadius());
17        System.out.println("Luas: " + circle.getArea());
18        System.out.println("Keliling: " + circle.getPerimeter());
19        System.out.println();
20
21        Square square = new Square(side:5.0, color:"Hijau", filled:true);
22
23        System.out.println(x:"----- Square -----");
24        System.out.println("Warna: " + square.getColor());
25        System.out.println("Sisi: " + square.getSide());
26        System.out.println("Luas: " + square.getArea());
27        System.out.println("Keliling: " + square.getPerimeter());
28    }
29 }
30
```

Output

```
Windows PowerShell
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> javac .\TestShapes.java
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> java TestShapes
----- Rectangle -----
Warna: Merah
Tinggi: 6.0
Lebar: 4.0
Luas: 24.0

----- Circle -----
Warna: Biru
Radius: 3.0
Luas: 6.0
Keliling: 9.0

----- Square -----
Warna: Hijau
Sisi: 5.0
Luas: 25.0
Keliling: 50.0
PS D:\Kuliah\Semester 4\PBO\PBO\PRAKTIKUM_8_PBO> |
```