

# **ORIENTAÇÃO À OBJETOS**

Baseado no Capítulo 6 de Programming Language Processors in Java, de Watt & Brown

- An *object* is a group of instance variables, to which a group of instance methods are attached.
- An *instance variable* is a named component of a particular object.
- An *instance method* is a named operation, which is attached to a particular object and is able to access that object's instance variables.
- An *object class* (or just *class*) is a family of objects with similar instance variables and identical methods.

```
class Point {
    // A Point object represents a geometric point located at (x, y).

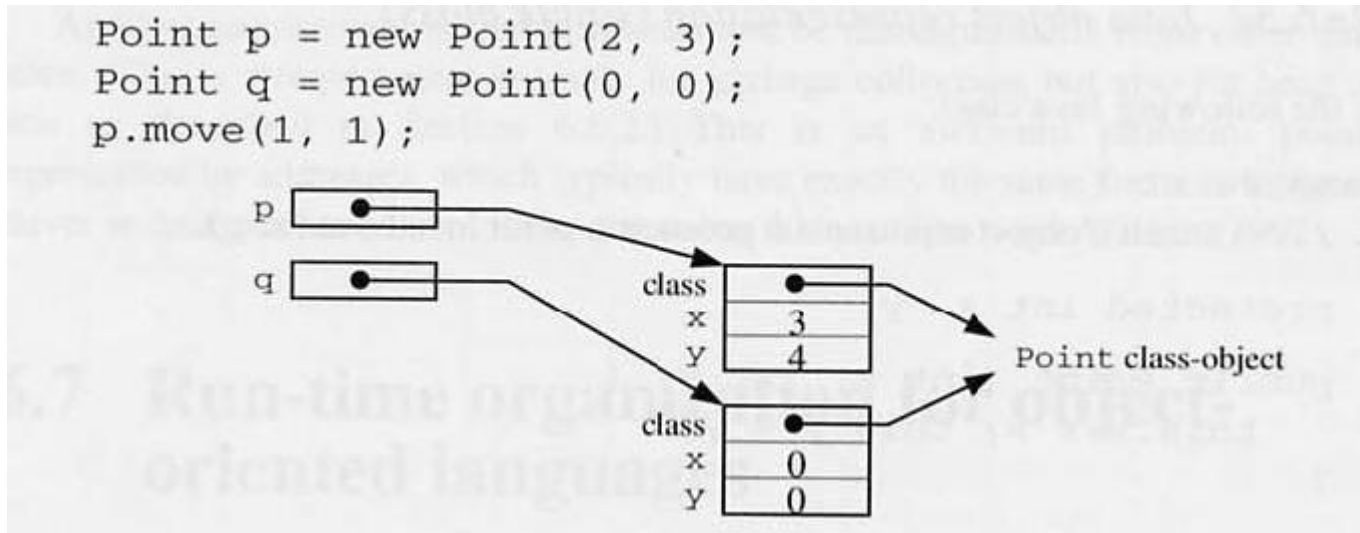
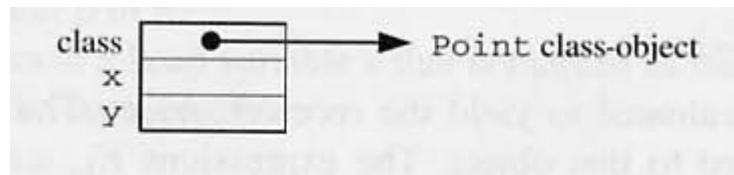
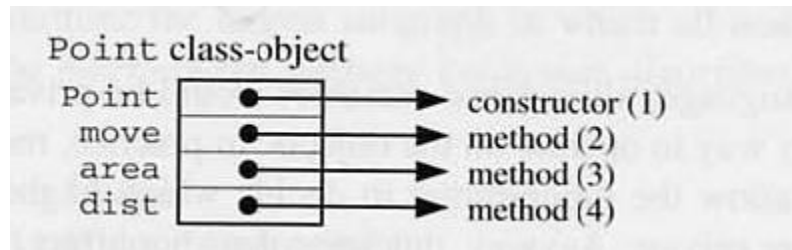
    protected int x, y;

    (1) public Point (int x, int y) {
        this.x = x; this.y = y;
    }

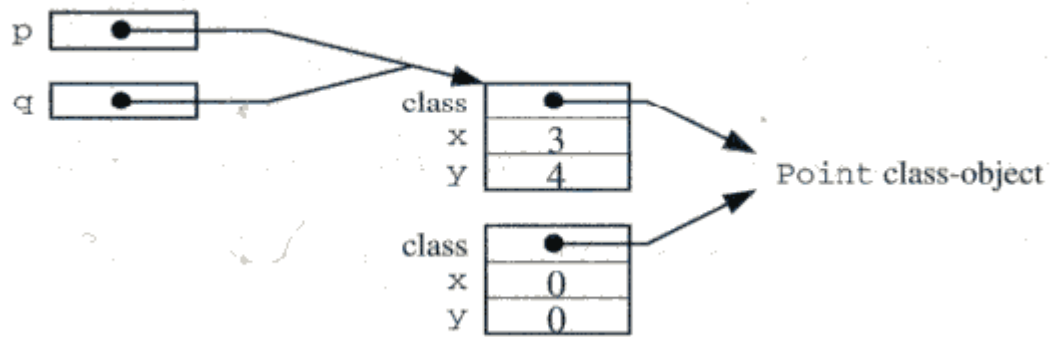
    (2) public void move (int dx, int dy) {
        this.x += dx; this.y += dy;
    }

    (3) public float area () {
        return 0.0;
    }

    (4) public float dist (Point that) {
        int dx = this.x - that.x;
        int dy = this.y - that.y;
        return Math.sqrt(dx*dx + dy*dy);
    }
}
```



q = p;



```
class Circle extends Point {
    // A Circle object represents a circle of radius r, centered at (x, y).
    protected int r;
(5) public Circle (int x, int y, int r) {
        this.x = x; this.y = y;  this.r = r;
    }
(6) public int radius () {
        return this.r;
    }
(7) public double area () {
        double pi = 3.1416;
        return pi * this.r * this.r;
    }
}
```

```
class Box extends Point {
    // A Box object represents a rectangle of width w and depth d,
    // centered at (x, y).

    protected int w, d;

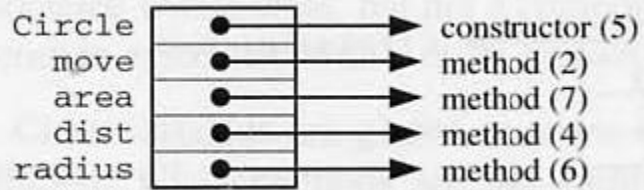
    (8) public Box (int x, int y, int w, int d) {
        this.x = x; this.y = y; this.w = w; this.d = d;
    }

    (9) public int width () {
        return this.w;
    }

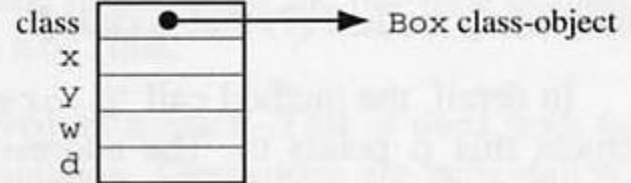
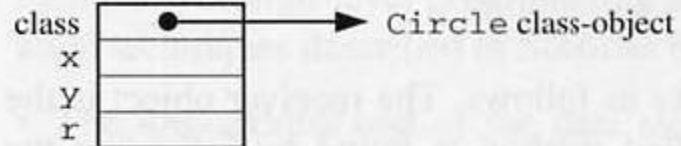
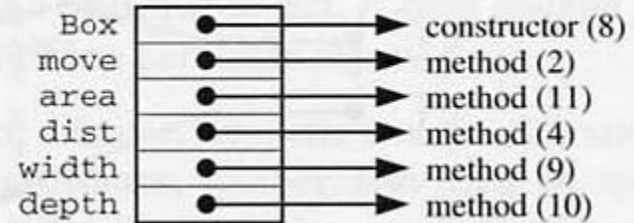
    (10) public int depth () {
        return this.d;
    }

    (11) public double area () {
        return (double) (this.w * this.d);
    }
}
```

### Circle class-object

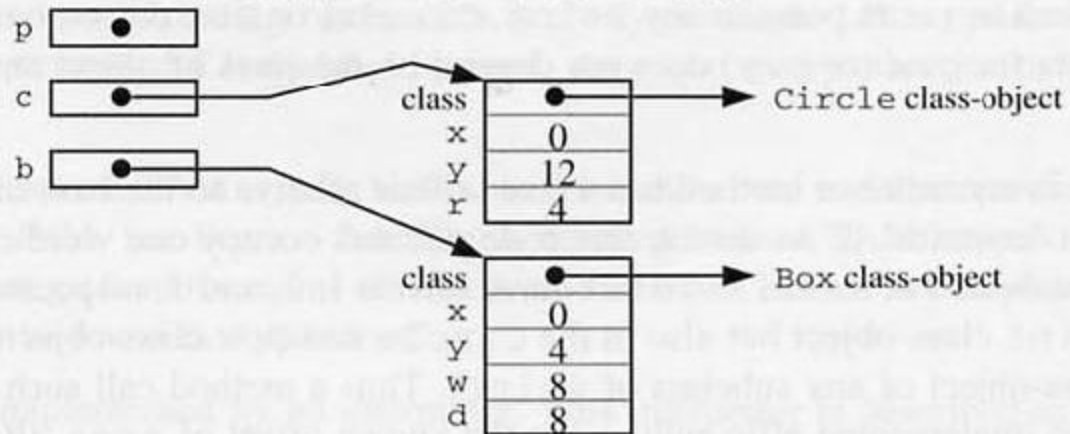


### Box class-object





```
int s      = 4;  
Point p   = null;  
Circle c  = new Circle(0, 3*s, s);  
Box b     = new Box(0, s, 2*s, 2*s);
```



```
p = c;  
p.move(20, 20);
```

