

CSE 11

Accelerated Intro to Programming

Lecture 10

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Announcements

- Quiz 10 due Wednesday @ 8am
- PA3 due Wednesday @ 11:59pm
- Survey 4 due Friday @ 11:59pm

WeeklyPay

- weeklyPay: takes a number of hours worked and an hourly rate, and returns the pay with overtime (over 40 hours) counting as double the rate

```
class CircleRegion {  
    ...  
    boolean contains(Point p)  
    { ... }  
}
```

```
class SquareRegion {  
    ...  
    boolean contains(Point p)  
    { ... }  
}
```

Both classes have a method with the **same header**

We can write an **interface** with the shared method

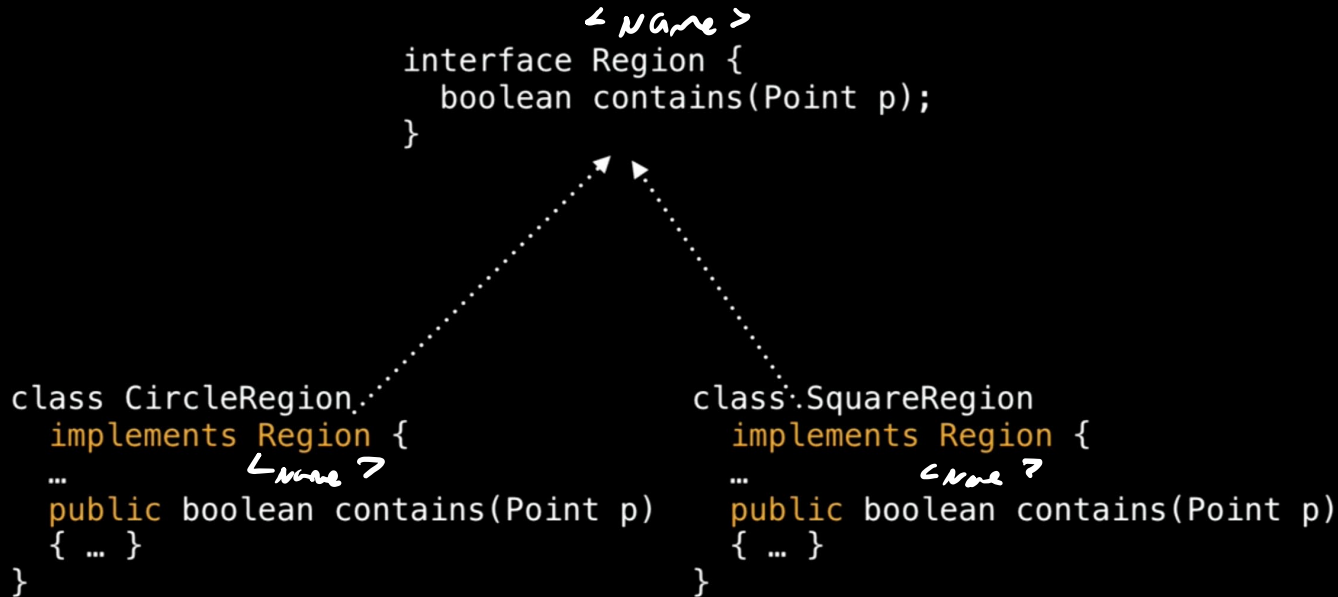
```
interface Region {  
    boolean contains(Point p);  
}
```

```
class CircleRegion  
    implements Region {  
    ...  
    public boolean contains(Point p)  
    { ... }  
}
```

```
class SquareRegion  
    implements Region {  
    ...  
    public boolean contains(Point p)  
    { ... }  
}
```

Both classes have a method with the **same header**

We can write an **interface** with the shared method



Both classes have a method with the **same header**

```
interface Region {  
    boolean contains(Point p);  
}
```

```
class CircleRegion  
    implements Region {  
    ...  
    public boolean contains(Point p)  
    { ... }  
}
```

```
class SquareRegion  
    implements Region {  
    ...  
    public boolean contains(Point p)  
    { ... }  
}
```

```
class ExamplesRegion {  
    Region circ = new CircleRegion(new Point(10, 5), 4));  
    Region square = new SquareRegion(new Point(5, 6), 8));  
}
```

We can use the same
interface type
for references of classes that implement it

```
interface Region {
    boolean contains(Point p);
}
```

```
class CircleRegion
    implements Region {
    Point center;
    double int radius;
    public boolean contains(Point p)
    { ... }
}
```

```
class SquareRegion
    implements Region {
    Point center;
    int sideLength;
    public boolean contains(Point p)
    { ... }
}
```

```
class ExamplesRegion {
    Region circ = new CircleRegion(new Point(10, 5), 4));
    Region square = new SquareRegion(new Point(5, 6), 8));
    double int num = circ.radius;
}
```

↑

What is stored in
the num field?

2 ~~A~~: 10 4 ~~C~~: 5

1 ~~B~~: 8 (6 D) it's an error

14 E: something else

Using an interface, we can
only use methods on the interface


```
interface Region {  
    boolean contains(Point p);  
}
```

```
class CircleRegion  
    implements Region {  
    Point center;  
    int radius  
    public boolean contains(Point p)  
    { ... }  
}
```

```
class SquareRegion  
    implements Region {  
    Point center;  
    int sideLength;  
    public boolean contains(Point p)  
    { ... }  
}
```

```
class ExamplesRegion {  
    Region circ = new CircleRegion(new Point(10, 5), 4);  
    Region square = new SquareRegion(new Point(5, 6), 8);  
    boolean contains1 = circ.contains(new Point(7, 6));  
}
```

What is stored in
the contains1 field?

17 A: true 9 C: error
6 B: false

```
interface Region {  
    boolean contains(Point p);  
}
```

```
class CircleRegion  
    implements Region {  
    ...  
    public boolean contains(Point p)  
    { ... }  
}
```

```
class SquareRegion  
    implements Region {  
    ...  
    public boolean contains(Point p)  
    { ... }  
}
```

```
class UnionRegion {  
    Region r1, r2;  
    UnionRegion(Region r1, Region r2) { ... }  
    public boolean contains(Point p) {  
        return this.r1.contains(p) ||  
               this.r2.contains(p);  
    }  
}
```

```

        interface Region {
            boolean contains(Point p);
        }

class CircleRegion
    implements Region {
    ...
    public boolean contains(Point p)
    { ... }
}

class SquareRegion
    implements Region {
    ...
    public boolean contains(Point p)
    { ... }
}

```

What is the value of
the b1 field?

```

class UnionRegion {
    Region r1, r2;
    UnionRegion(Region r1, Region r2) { ... }
    public boolean contains(Point p) {
        return this.r1.contains(p) ||
               this.r2.contains(p);
    }
}

class ExamplesRegion {
    Region circ = new CircleRegion(new Point(10, 5), 4);
    Region square = new SquareRegion(new Point(5, 6), 8);
    UnionRegion ur = new UnionRegion(this.square, this.circ);
    boolean b1 = this.ur.contains(new Point(13, 5));
}

```

19 A: true ~~10: error~~
10 B: false