luv2code

Abstract Classes

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- Can't create an instance of an abstract class
- Abstract class can also have abstract method(s)
- Abstract method must be implemented by concrete subclasses

Abstract Class Example

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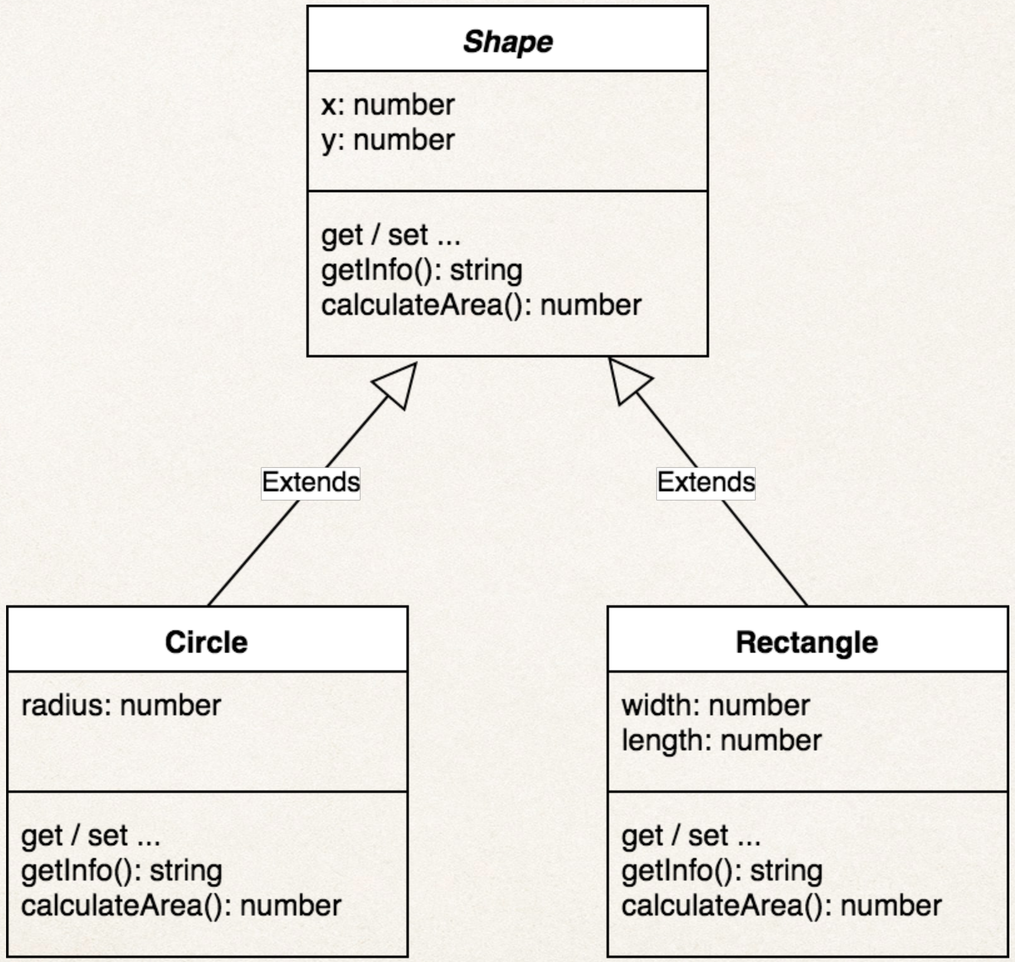

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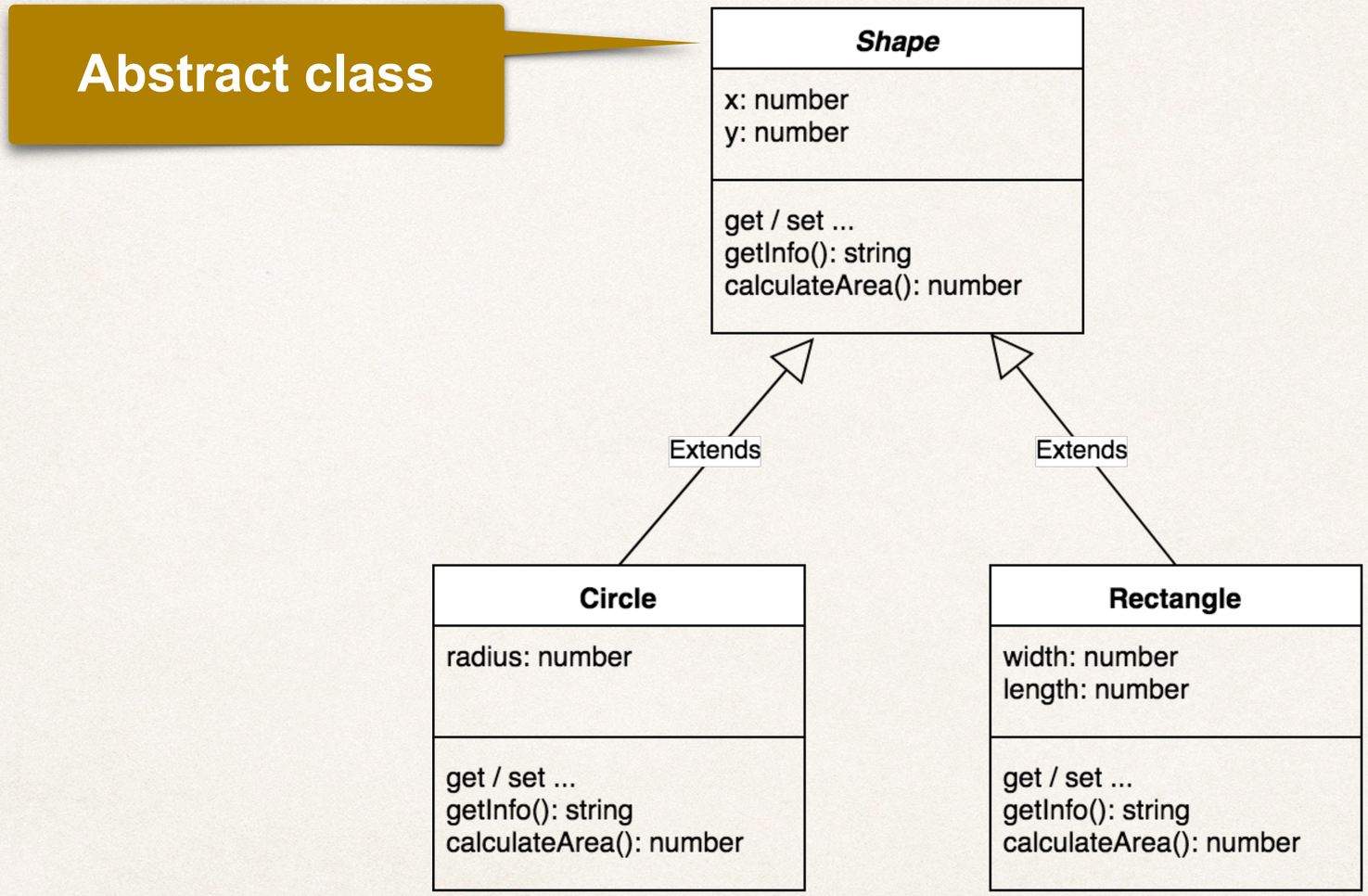

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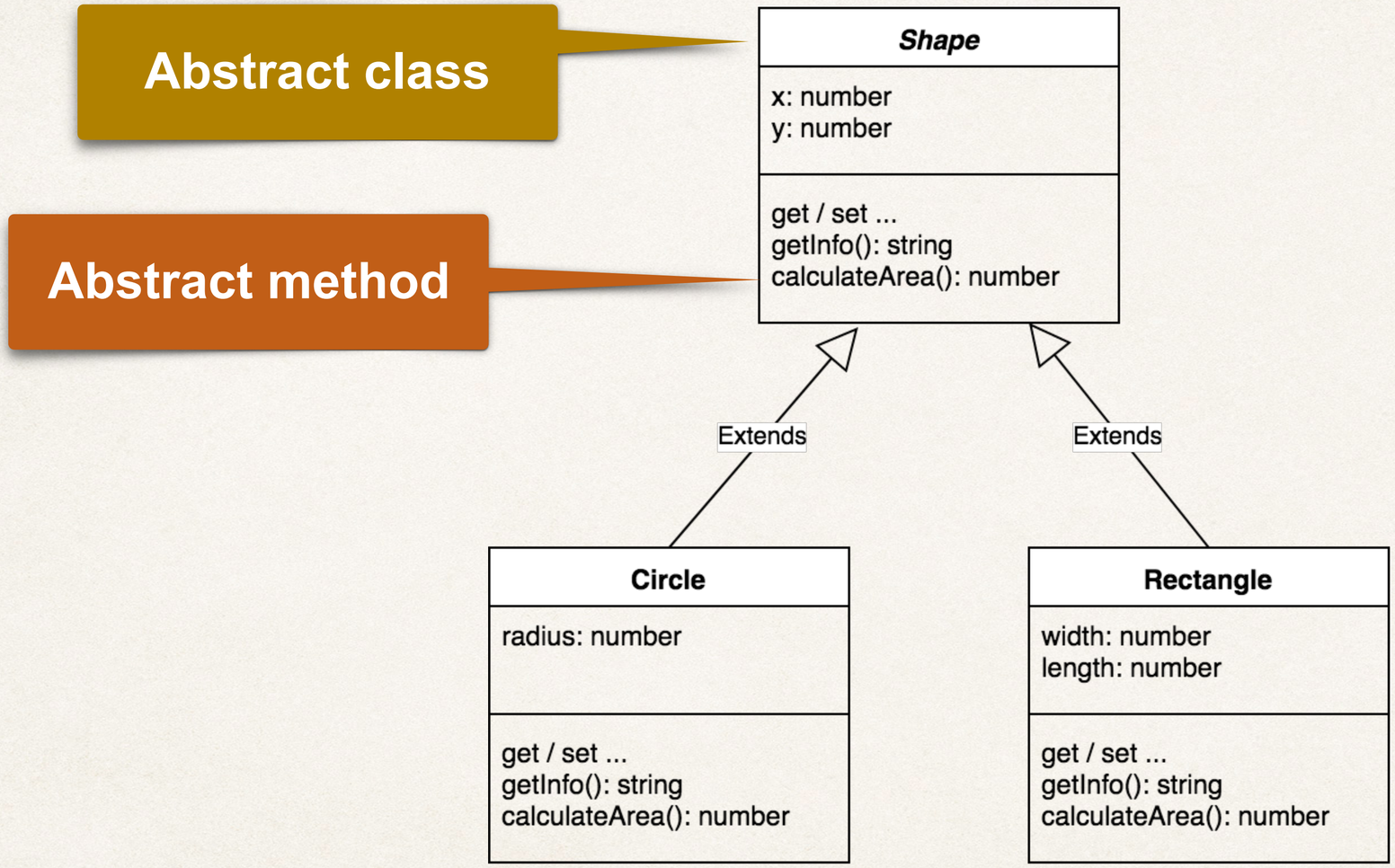

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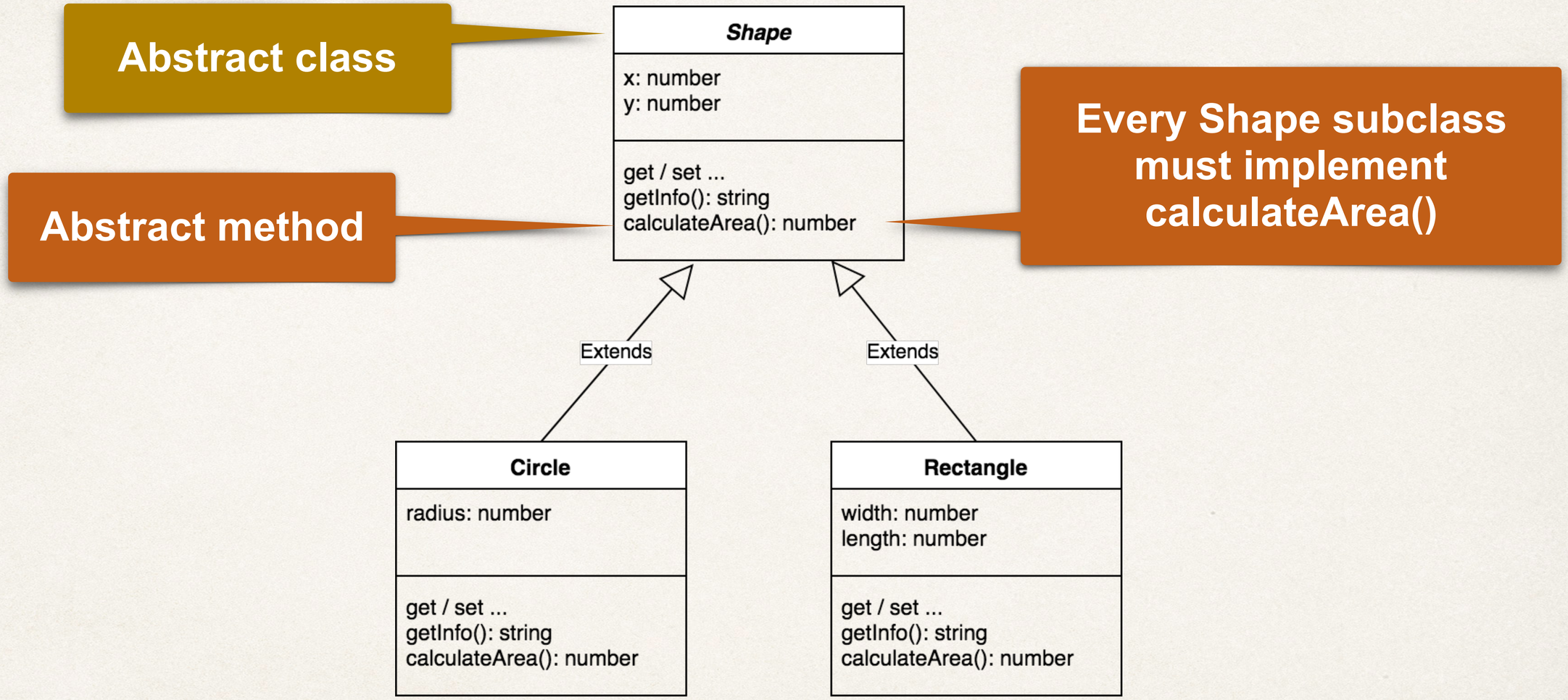

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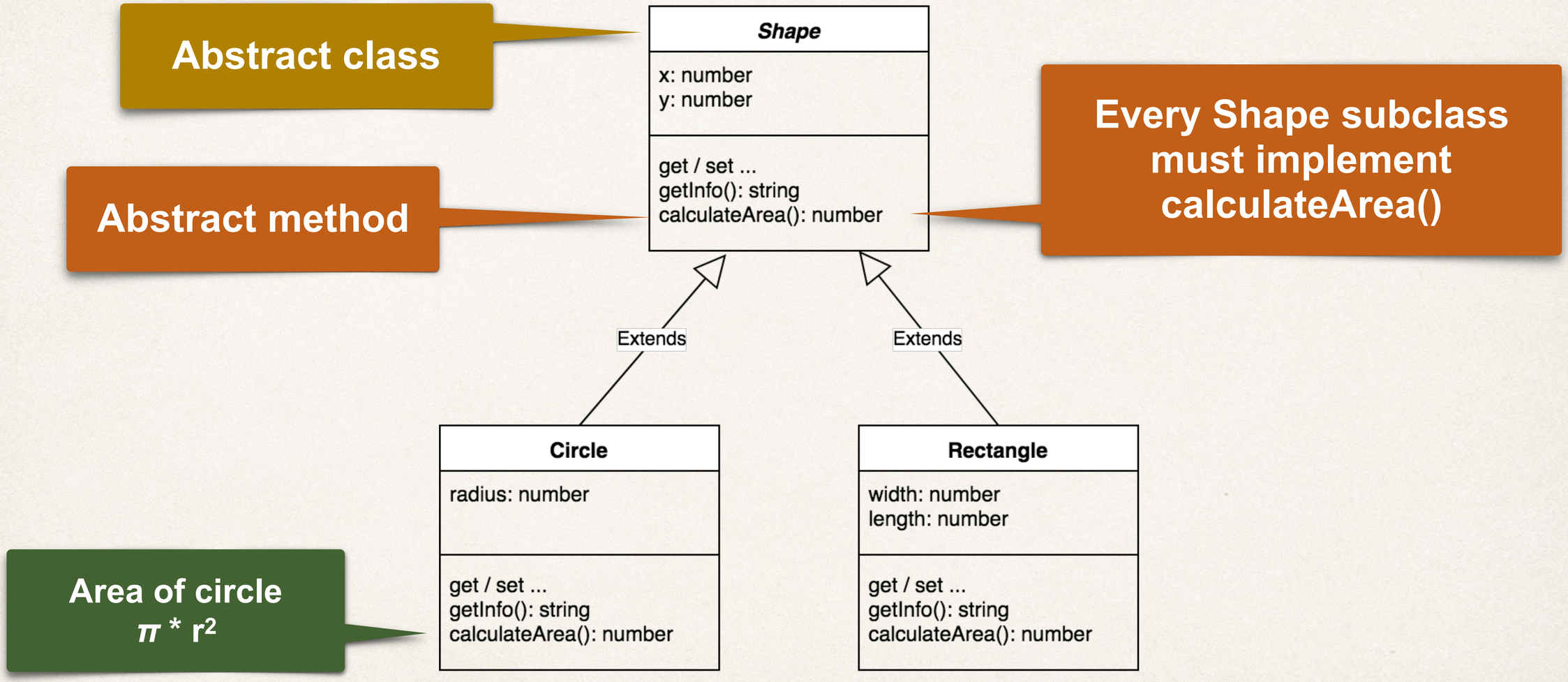

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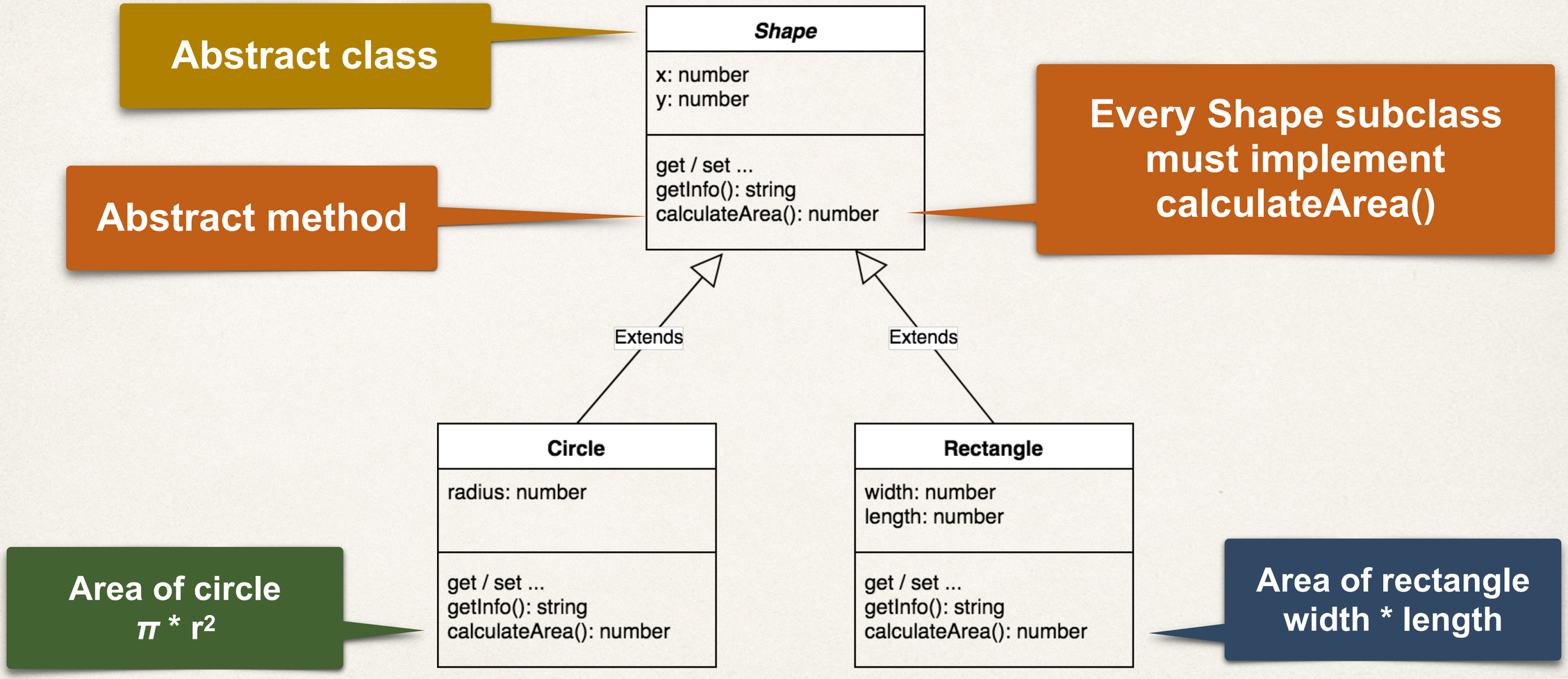

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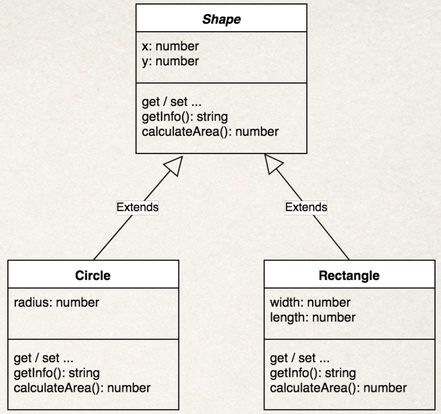

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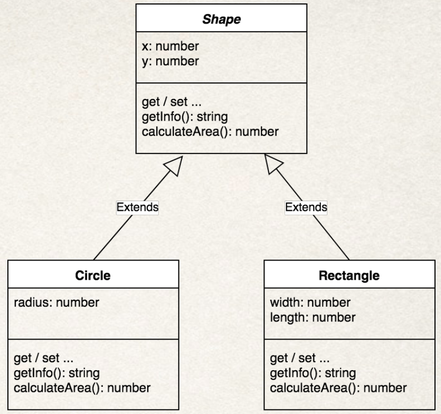

File: Shape.ts

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export abstract class Shape {

    // previous code ...

    abstract calculateArea(): number;
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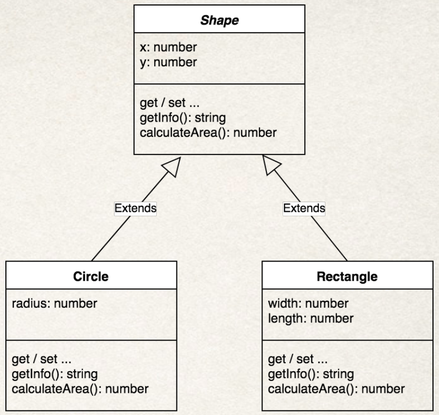

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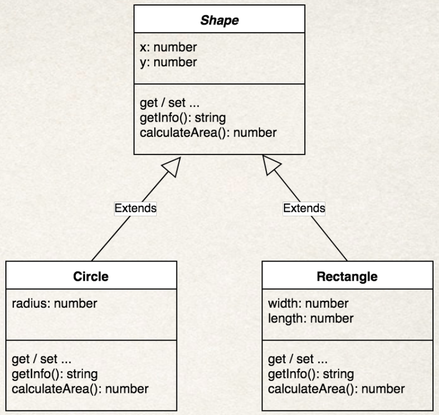

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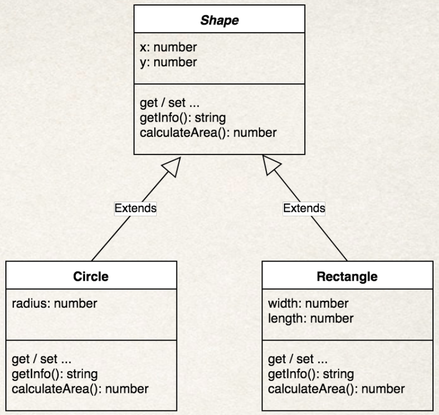

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File: Rectangle.ts

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import { Shape } from './Shape';

export class Rectangle extends Shape {

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    calculateArea(): number {
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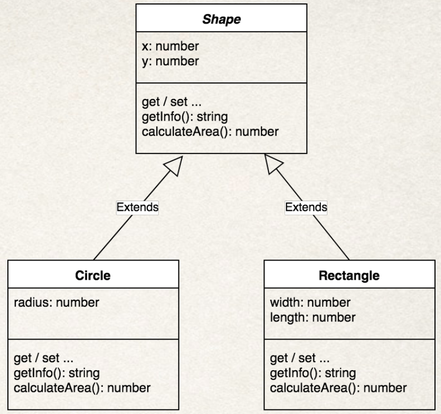

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Abstract method

Override the calculateArea() method

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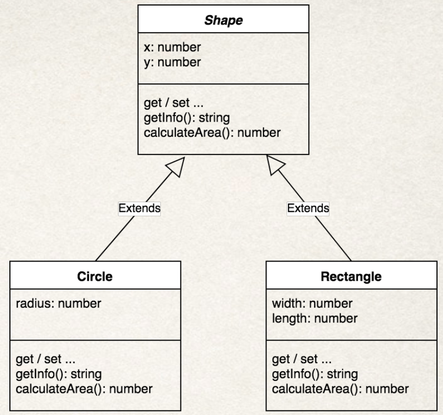
Circle



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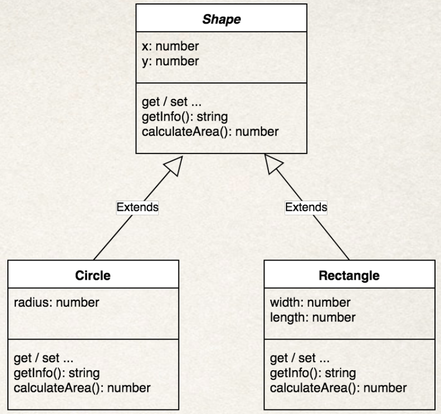

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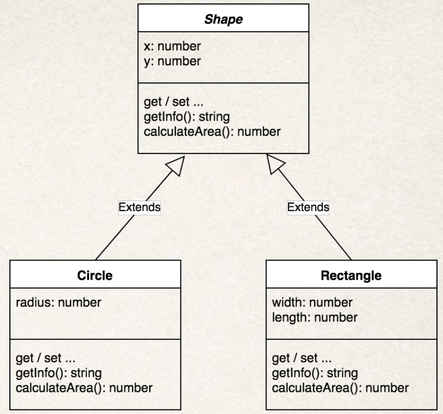

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File: Circle.ts

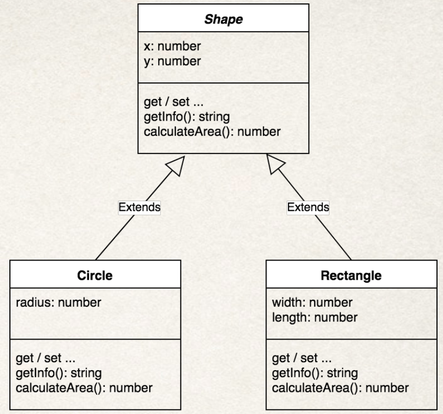
```
import { Shape } from './Shape';

export class Circle extends Shape {

    // previous code ...

    calculateArea(): number {
        return Math.PI * Math.pow(this._radius, 2);
    }
}
```

Circle



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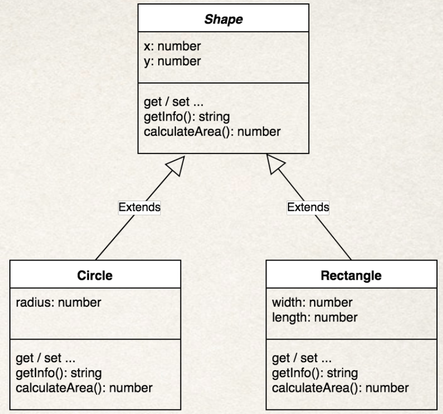

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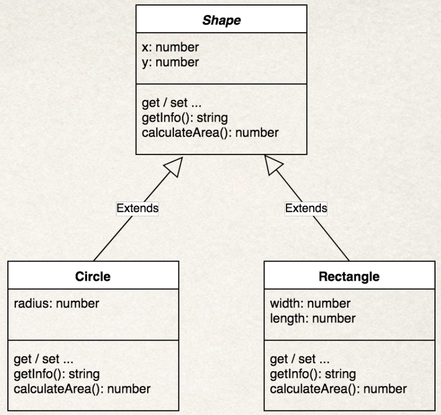
Override the calculateArea() method

Area of circle
$\pi * r^2$

Circle

`Math` is a built-in object that has properties and methods for mathematical constants and functions



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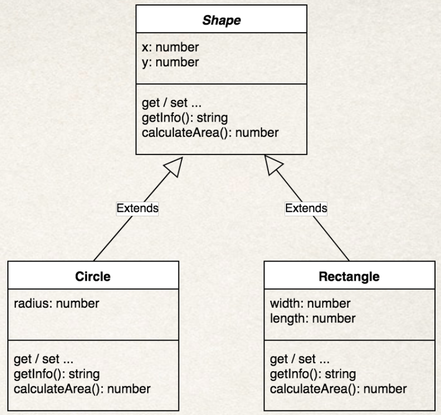
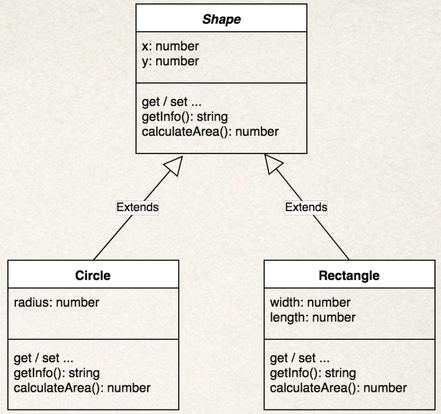
Creating an Instance



Creating an Instance

```
let myShape = new Shape(10, 15);
console.log(myShape.getInfo());
```



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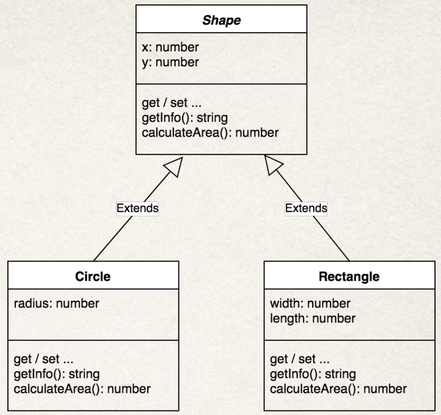


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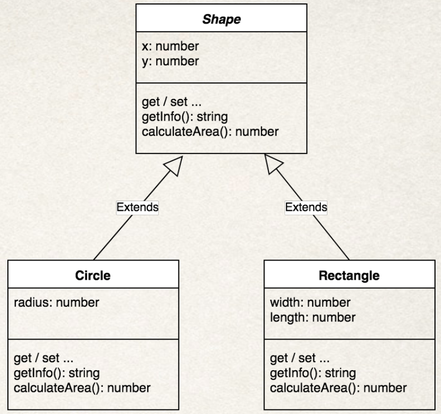
This will NOT compile since Shape is an abstract class

Can't create instance of abstract class directly

Only concrete subclasses: Circle, Rectangle, …

Creating an Array of Shapes



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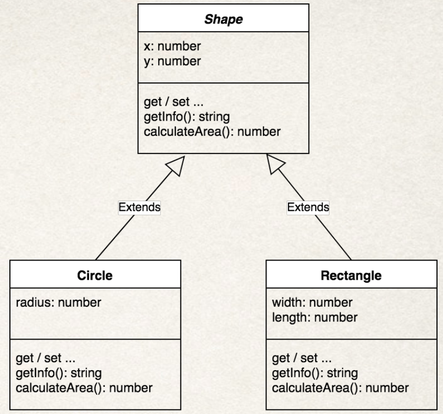

File: ArrayDriver.ts

```
… …

let myCircle = new Circle(5, 10, 20);
let myRectangle = new Rectangle(0, 0, 3, 7);

// declare an array for shapes … initially empty
let theShapes: Shape[] = [];

// add the shapes to the array
theShapes.push(myCircle);
theShapes.push(myRectangle);
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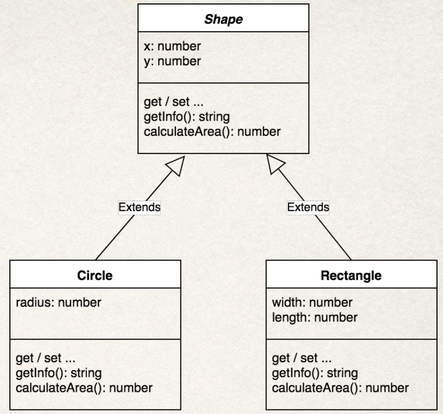
Creating an Array of Shapes



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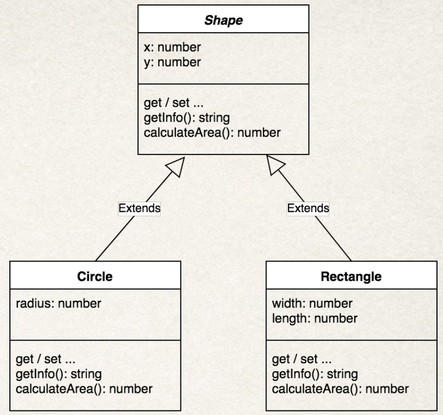
Creating an Array of Shapes



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x=0, y=0, width=3, length=7
Area=21
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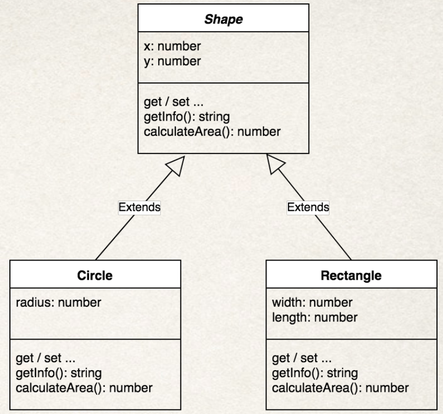
Creating an Array of Shapes



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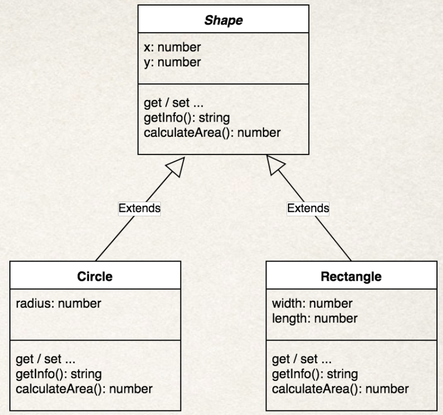

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Area of circle
$\pi * r^2$

Area of rectangle
width * length