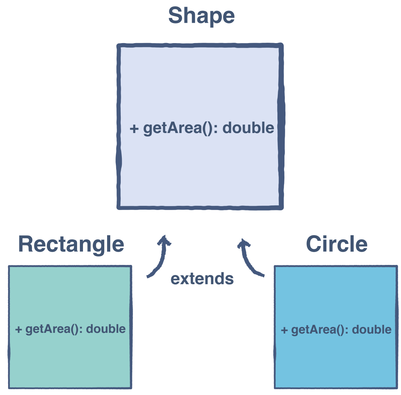
What is Dynamic Polymorphism?

> **Dynamic polymorphism** is the mechanism by which methods can be defined with the same name, return type, and parameters in the base class and derived classes.

The call to an overridden method is decided at the runtime.

Dynamic Polymorphism Example

Let's consider the example of the `Shape` class:




```
// Shape Class
class Shape {

  public double getArea() {
    return 0;
  }

}

// A Rectangle is a Shape
class Rectangle extends Shape {  // extended form the Shape class

  private double length;
  private double width;

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

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

}

// A Circle is a Shape
class Circle extends Shape {
```

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A reference variable of the base class can be referred to the derived classes objects:

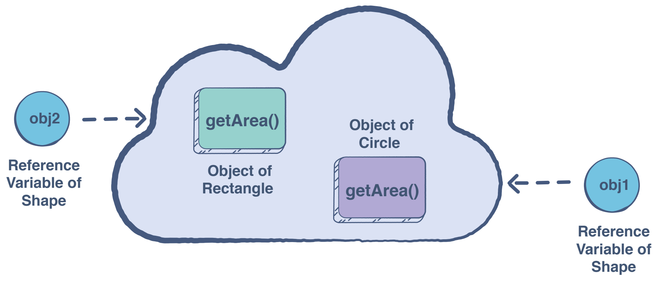
```
Shape obj1 = new Circle(3);
Shape obj2 = new Rectangle(2, 3);

//.
//.
//.

obj1.getArea();
obj2.getArea();

```

Here, the reference variables **obj1** and **obj2** are of the `Shape` class, but they are pointing to the `Circle` and `Rectangle` respectively.



Explanation

- `obj1.getArea()` will execute `getArea()` method of the subclass `Circle` class.
- `obj2.getArea()` will execute `getArea()` method of the subclass `Rectangle` class.
- `obj1` is a reference to the `Circle` class, it calls the method of `Circle` class, as it points to a *Circle* object.
- `obj2` is a reference to the `Rectangle` class, it calls the method of `Rectangle` class, as it points to a *Rectangle* object.

This is decided during runtime and is, therefore, called **dynamic** or **runtime** polymorphism.