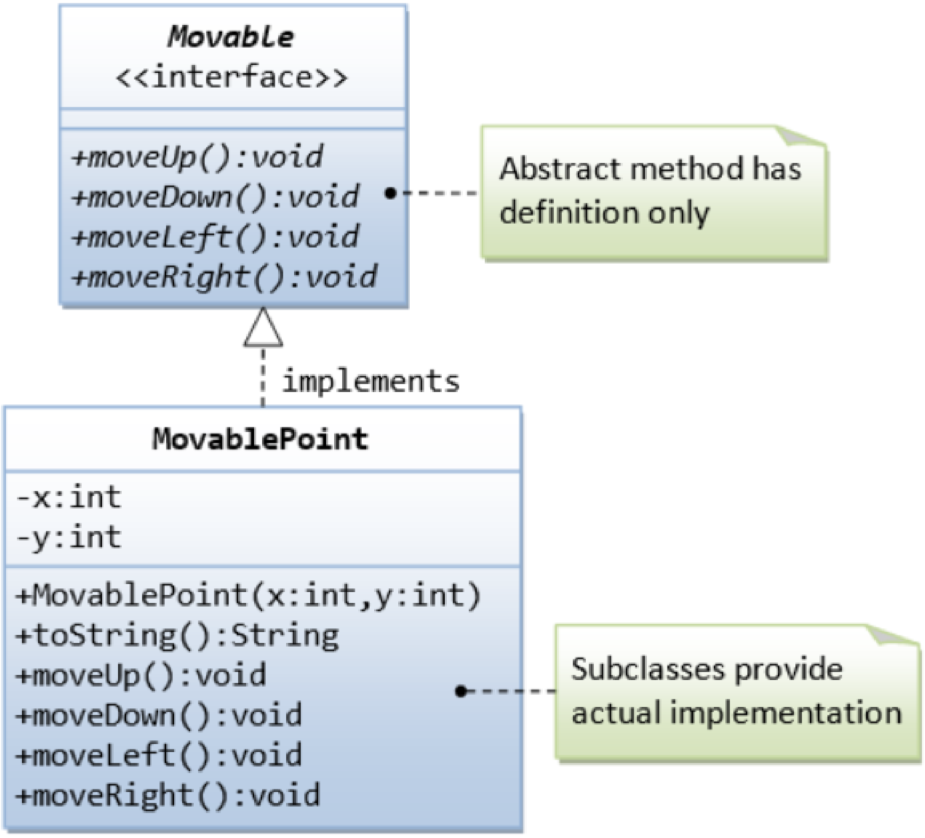
Assignment (BCAC391)

(Interface, abstract method)

1.



testMovableInterface.java

We can also upcast subclass instances to the `Movable` interface, via polymorphism, similar to an `abstract` class.

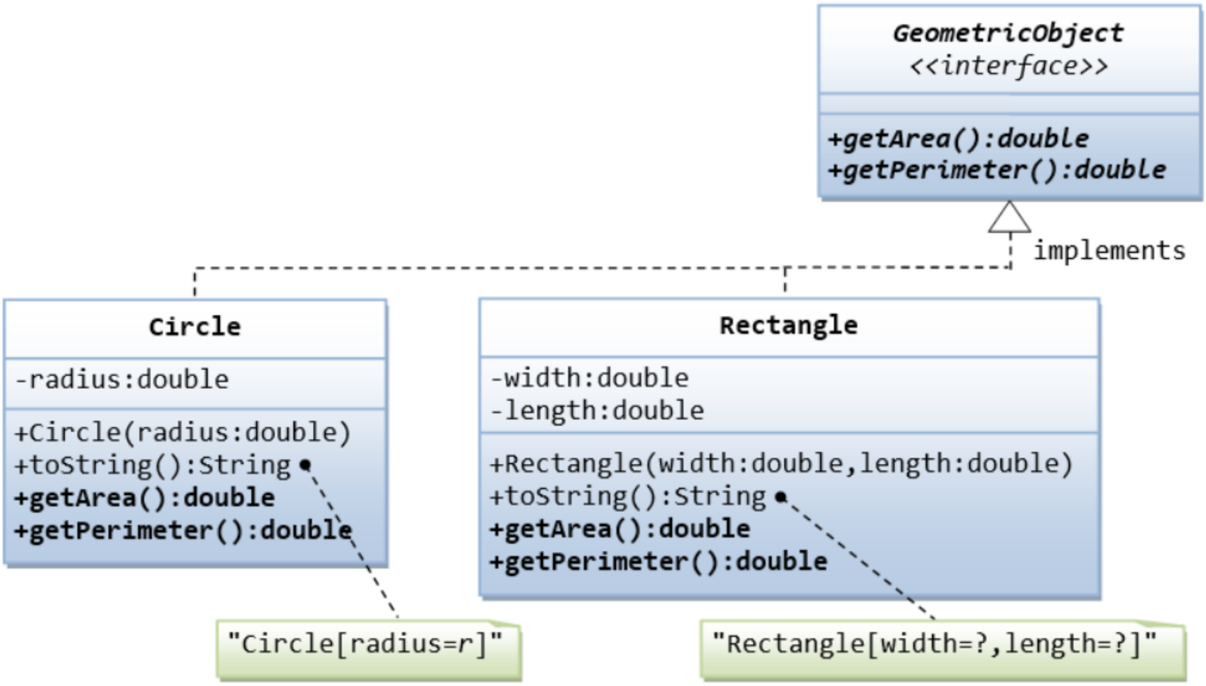
```
public class testMovableInterface {
  public static void main(String[] args) {
    MovablePoint p1 = new MovablePoint(1, 2);
    System.out.println(p1);//(1,2)
    p1.moveDown();
    System.out.println(p1);//(1,3)
    p1.moveRight();
    System.out.println(p1);//(2,3)

    // Test Polymorphism
    Movable p2 = new MovablePoint(3, 4);  // upcast
    p2.moveUp();
    System.out.println(p2);//(3,3)
```

```
      MovablePoint p3 = (MovablePoint)p2;   // downcast
      System.out.println(p3);//(3,3)
   }
}
```

Expected Output:

```
(1,2)
(1,3)
(2,3)
(3,3)
(3,3)
```

2. Write an **interface** called **`GeometricObject`**, which contains 2 `abstract` methods: `getArea()` and `getPerimeter()`, as shown in the class diagram. Also write an implementation class called `Circle`. Mark all the overridden methods with annotation `@Override`.



Below is a test driver **(testGeometricObjec.java)** to test the above class:

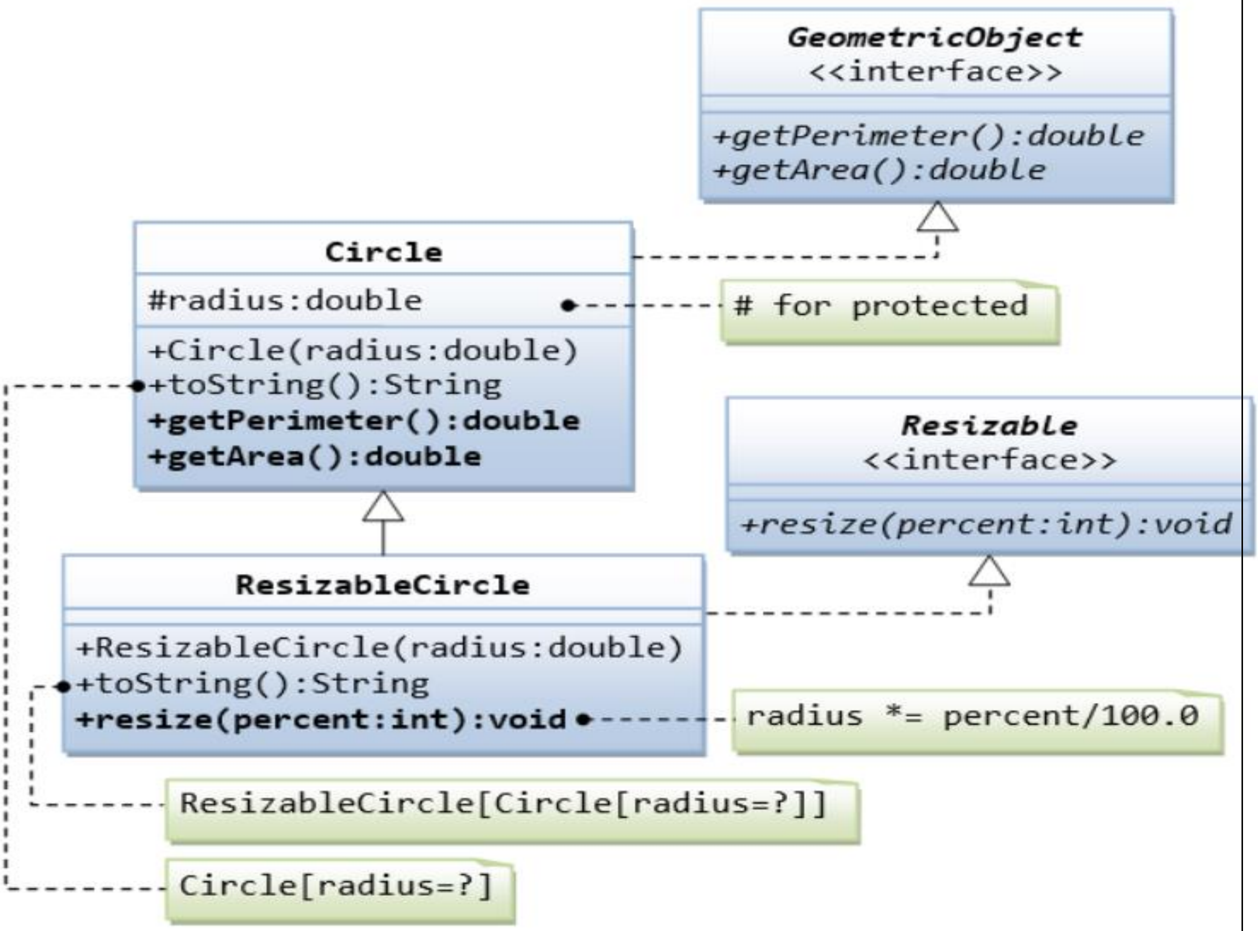
```
public class testGeometricObjects {
   public static void main(String[] args) {

      Circle c1=new Circle(10.0);
      System.out.println(c1);
      Circle c2=new Circle(20.0);
```

```
        System.out.println("Area:"+c2.getArea());
        System.out.println("Perimeter:"+c2.getPerimeter());

        Rectangle r1=new Rectangle(10.0, 5.0);
        System.out.println(r1);
        Rectangle r2=new Rectangle(5.0,2.0);
        System.out.println("Area"+r2.getArea());
        System.out.println("Perimeter"+r2.getPerimeter());
    }
}
```

Expected Output is:

```
Circle[radius=10.0]
Area:1256.6370614359173
Perimeter:125.66370614359172
Rectangle[length=10.0, width=5.0]
Area10.0
Perimeter14.0
```

3.



Below is the test drive (**testResizableGeometricObject.java**) code to implement above class:

```
public class testResizableGeometricObject {
   public static void main(String[] args) {
      // TODO code application logic here

      Circle c1=new Circle(10.0);
      System.out.println(c1);
      System.out.println("Area"+c1.getArea());
      System.out.println("Perimeter"+c1.getPerimeter());

      ResizableCircle r1=new ResizableCircle(200.0);
      System.out.println(r1);
      r1.resize(25);
      System.out.println(r1);
   }
}
```

Expected Output:

```
Circle[radius=10.0]
Area314.1592653589793
Perimeter62.83185307179586
ResizableCircle[Circle[radius=200.0]]
ResizableCircle[Circle[radius=50.0]]
```