

**Lab 6 –Abstract Class and Interfaces**

*Answer the following questions.*

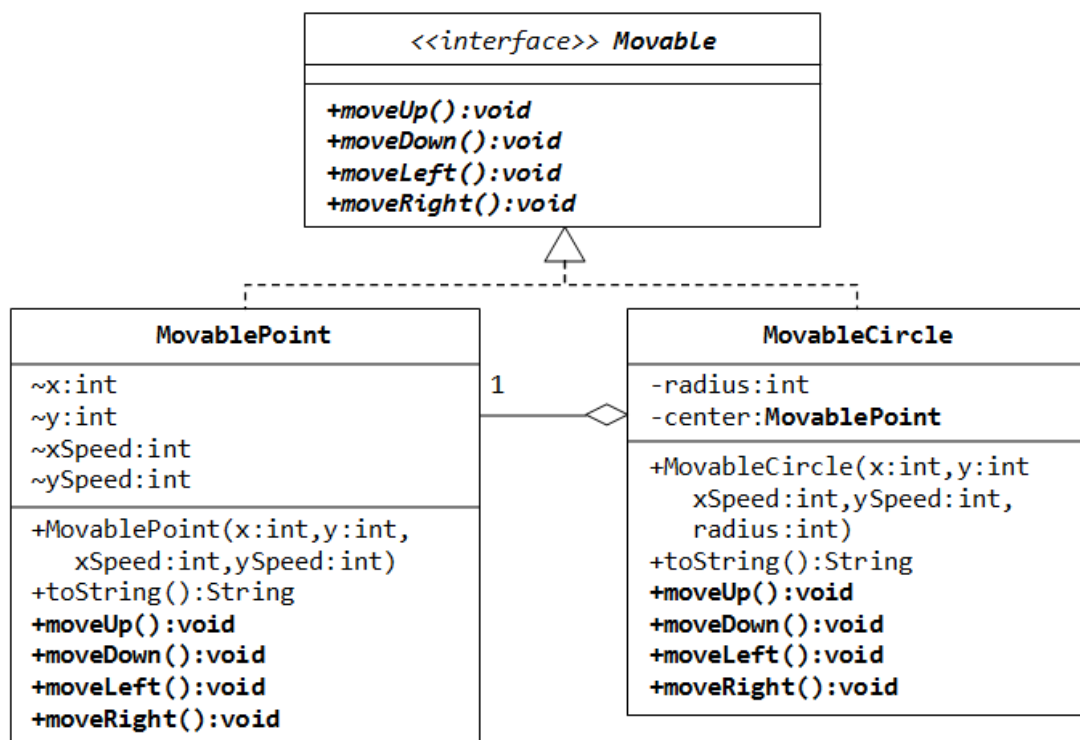
---

Instructor-led Demo:

1. Write a program that handles employees' salaries and workloads. There are part time and full time employee and they are payable with salaries. The salary for full time employee will be paid as monthly basis and part time employee will be based on hourly worked. There is a kind of employee (Assistant) which is not payable. All employees are required to work a certain number of hours depending on the type of employee. Part time work not more than 6 hour a week, full time work 40 hours a week and assistant work only 2 hours a week.

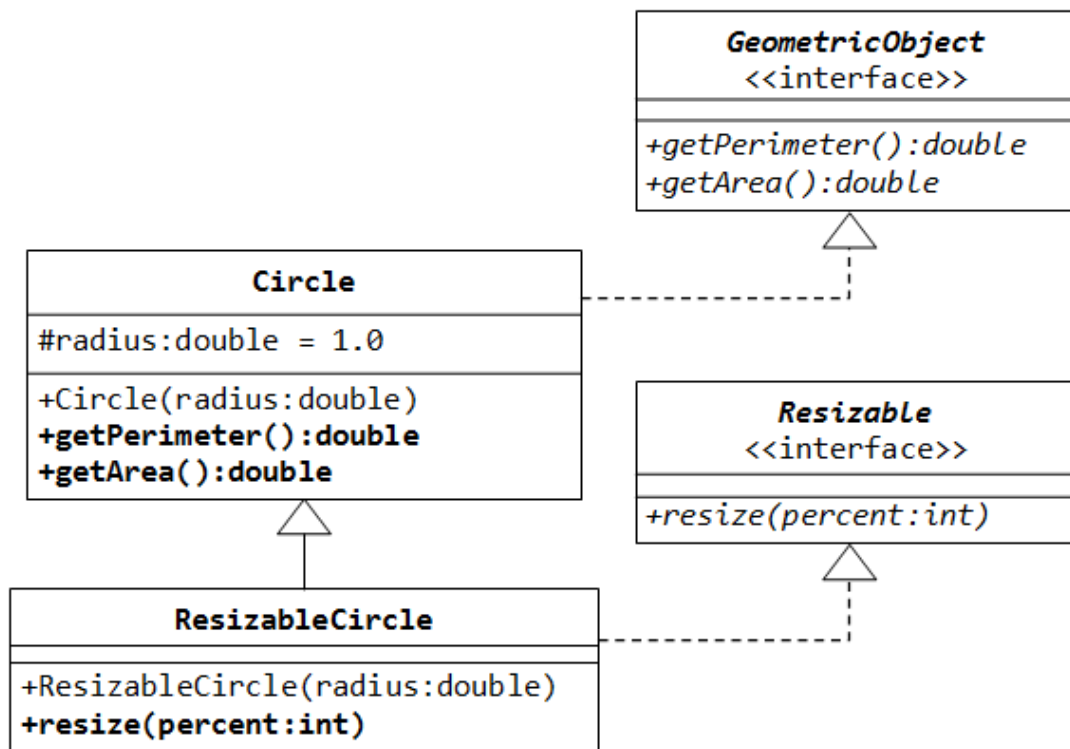
Exercise:

1. Write a method that returns the largest object in an array of objects. The method header is `public static Object max(Comparable[] a)`. All the objects are instances of the `Comparable` interface. The order of the objects in the array is determined using the `compareTo` method. Write a test program that creates an array of ten strings, an array of ten integers, and an array of ten dates, and find the largest string, integer, and date in the arrays.
2. Consider the UML diagram:



Write a program that demonstrate Movable interface and MovablePoint and MovableCircle classes. State any assumption for your program.

3. Modify the Lab 5-Q3, according to the UML diagram below:



Write a test program called `TestResizableCircle` to test the method defined in `ResizableCircle`.

4. Write two comparator classes that demonstrate how to sort elements in an array using the `Comparator` interface. The example creates an array of `Customer` objects. The sort criteria are by age and DOB. Write a test program called `TestCustomerSort` to test the sorting by comparator.

#### More Exercise on OOP:

5. You are asked to write a discount system for a beauty saloon, which provides services and sells beauty products. It offers 3 types of memberships: Premium, Gold and Silver. Premium, gold and silver members receive a discount of 20%, 15%, and 10%, respectively, for all services provided. Customers without membership receive no discount. All members receives a flat 10% discount on products purchased (this might change in future). Your system shall consist of three classes: `Customer`, `Discount` and `Visit`, as shown in the class diagram. It shall compute the total bill if a customer purchases \$x of products and \$y of services, for a visit. Also write a test program to exercise all the classes.