



## North South University

Department of Electrical and Computer Engineering

### CSE 215L: Programming Language II Lab

#### Lab Manual - 13

Lab Instructor: Taif Al Musabe

#### Objective:

- To understand abstract class

#### Task:

Implement the following classes and Create a Rectangle instance store in Shape reference invoke all abstract method

<table><tr><th><b>&lt;&lt;abstract&gt;&gt;Shape</b></th></tr><tr><td>- name: String</td></tr><tr><td>+ Shape(name: String) /* accessor-mutator */ + abstract area(): double + abstract perimeter(): double</td></tr></table>	<b>&lt;&lt;abstract&gt;&gt;Shape</b>	- name: String	+ Shape(name: String) /* accessor-mutator */ + abstract area(): double + abstract perimeter(): double	<table><tr><th><b>Rectangle extends Shape</b></th></tr><tr><td>- length: double - width: double</td></tr><tr><td>+ Rectangle(name: String, length: double, width: double) /* accessor-mutator */ + area(): double + perimeter(): double</td></tr></table>	<b>Rectangle extends Shape</b>	- length: double - width: double	+ Rectangle(name: String, length: double, width: double) /* accessor-mutator */ + area(): double + perimeter(): double
<b>&lt;&lt;abstract&gt;&gt;Shape</b>							
- name: String							
+ Shape(name: String) /* accessor-mutator */ + abstract area(): double + abstract perimeter(): double							
<b>Rectangle extends Shape</b>							
- length: double - width: double							
+ Rectangle(name: String, length: double, width: double) /* accessor-mutator */ + area(): double + perimeter(): double							

#### Homework:

Implement the following classes and invoke discountedPrice() for object of each class.

<b>&lt;&lt;abstract&gt;&gt; Discountable</b>
discountedPrice(price: double): double

<table><tr><td><b>PercentageDiscount</b></td></tr><tr><td>- percentage: double</td></tr><tr><td>+ PercentageDiscount(percentage: double) + getPercentage(): double + setPercentage(percentage: double): void + discountedPrice(price: double): double</td></tr></table>	<b>PercentageDiscount</b>	- percentage: double	+ PercentageDiscount(percentage: double) + getPercentage(): double + setPercentage(percentage: double): void + discountedPrice(price: double): double	<table><tr><td><b>ThresholdDiscount</b></td></tr><tr><td>- threshold: double - discount: double</td></tr><tr><td>+ ThresholdDiscount(threshold: double, discount: double) + getThreshold(): double + getDiscount(): double + setThreshold(threshold: double): void + setDiscount(discount: double): void + discountedPrice(price: double): double</td></tr></table>	<b>ThresholdDiscount</b>	- threshold: double - discount: double	+ ThresholdDiscount(threshold: double, discount: double) + getThreshold(): double + getDiscount(): double + setThreshold(threshold: double): void + setDiscount(discount: double): void + discountedPrice(price: double): double
<b>PercentageDiscount</b>							
- percentage: double							
+ PercentageDiscount(percentage: double) + getPercentage(): double + setPercentage(percentage: double): void + discountedPrice(price: double): double							
<b>ThresholdDiscount</b>							
- threshold: double - discount: double							
+ ThresholdDiscount(threshold: double, discount: double) + getThreshold(): double + getDiscount(): double + setThreshold(threshold: double): void + setDiscount(discount: double): void + discountedPrice(price: double): double							