

North South University

Department of Electrical and Computer Engineering

CSE 215L: Programming Language II Lab

Lab - 13: Abstract Class

Learning Objectives:

- to learn about Abstract Class and its applications

Definition: A class containing one or more abstract methods is called an abstract class. An abstract class must be declared with a class-modifier `abstract`. An abstract class CANNOT be instantiated, as its definition is not complete.

UML Notation: abstract classes and methods are shown in *italic*.

Lab Task:

<i>Shape</i>
- color: String
+ <i>getArea(): double</i> + <i>getPerimeter(): double</i> + toString(): String

Triangle
- base: double - height: double
+ Triangle() + Triangle(b: double, h: double) + setBase(b: double): void + setHeight(h: double): void + getBase(): double + getHeight(): double + getArea(): double + getPerimeter(): double + toString(): String

Rectangle
- length: double - width: double
+ Rectangle() + Rectangle(l: double, w: double) + setLength(l: double): void + setWidth(w: double): void

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+ getLength(): double
+ getWidth(): double
+ getArea(): double
+ getPerimeter(): double
+ toString(): String
```

Suppose, Shape is an abstract class and Triangle, Rectangle are its two derived classes. Now accomplish the following tasks.

a) Create an instance of the Triangle and Rectangle class respectively and you must read their initialization values from the user.

b) Print the status of both instances using the toString() method.

[Hint: Status for Triangle instance: base: p, height: q, area: r and perimeter: s and Status for Rectangle instance: length: p, width: q, area: r and perimeter: s, where p, q, r, s are real numbers.]