**Lab 4 20-09-2017**

**Object Oriented Concepts and Programming**

**Learning Objectives**

1. Introduce the concept of a constructor and its purpose
2. Introduce the no-argument and parameterized constructor and method overloading in this context
3. Emphasize the importance of constructor and what exactly should be done inside a constructor

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| **Lab Walkthrough** |

**Program 3.1**

A sample Dog **class**.

**Fields** are name and age.

**Methods** are bark and wakeTheNeighbors.

**Program 4.1: The Dog class**

public class Dog {  
 String name;  
 int age;  
  
 Dog() {  
 name = “Fido”;  
 age = 5;  
 }  
  
 private void bark() {  
 System.out.println("Woof!");  
 }

* public void wakeTheNeighbors(int quantity ) {
* System.out.println(age + “ years Dog ” + name + “ says: ”)  
   while (quantity > 0) {  
   bark( );  
   quantity = quantity – 1;  
   }  
  } // end the method
* } // ends the class

**Program 4.2: The DogTest class**

public class DogTest {

public static void main(String[ ] args) {  
 Dog fido = new Dog();  
 fido.wakeTheNeighbors();  
}

}

**Output:**

**5 years Dog Fido says:**

**Woof!**

**Woof!**

**Woof!**

**… 50 times**

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| **Lab Demo** |

**Lab Demo 4.1.**

* + Walkthrough

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| **Lab Task (Evaluated in Lab)** |

**(Will be evaluated as lab mini-assignment-1)**

**Lab Task 4.1**

* Write a class to simulate a bank account.
  + Data
    - Account Title
    - balance
  + Constructors
    - One parameterized constructor for account name, assign default value of 500 to balance.
    - One parameterized constructor for both name and balance
  + Methods
    - A method to print balance
    - To deposit given amount into balance
    - To withdraw given amount from balance

**Lab Task 4.2**

* Write test class for Account class
  + Create an account object using parameterized constructor.
  + Show the current balance
  + Ask the user amount to deposit (use Scanner)
  + Deposit the amount
  + Show the new balance
  + Ask the user amount to withdraw (use Scanner)
  + Withdraw the amount
  + Show the new balance

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| **Home Task** |

**(To be submitted on turnitin before next lab)**

**Home Task 4.1**

* Design a class Cylinder, which has following members:
  + Data:
    - radius
    - height
  + Constructor
    - A no-argument constructor
    - A one-argument constructor receiving height and setting radius to default value 1
    - A two-argument constructor receiving height and radius
  + Methods:
    - Setter functions (total 2)
    - Getter functions (total 2)
    - computeArea
    - computeVolume
      * look for the relevant formulae over internet
    - displayInfo
      * Showing cylinder height, radius, area and volume
* Test class to test Cylinder
  + Demonstrate all the above constructors/methods by creating different objects and calling each constructor/method at least once