

## Exercise 10

### Implementing Classes 1: Cylinder Tank Problem

#### Introduction:

Volume of the cylinder:  $v = \pi r^2 h$

Creating constructors and destructors

```
classID ();  
~classID();
```

Implementing constructors

```
classID::classID()  
{  
    //initialization of variables  
}
```

Implementing destructors

```
classID::~~classID()  
{  
}
```

**Objectives:** To create a class for a cylinder tank with the appropriate functions.  
To implement and test the functions that are in the class.

**Materials:** Pen, Paper and C++ Compiler (MinGW using Code::Blocks IDE)

#### Procedure:

1. Create a class named `cylinderTank` with the private variables indicated as follows:

```
double height           // the height of the tank (meters)  
double radius           //the width of the tank (meters)  
double aveDrainRate     //average drain rate of the tank (liters/sec)  
double aveFillRate      //average fill rate of the tank (liters/sec)
```

2. In your class, write the function prototypes as indicated below

```
cylinderTank()           //default constructor, sets all variables to 0  
void setHeight (double) //set tank height  
void setRadius (double) //set tank radius  
void setDrainRate (double) //set tank drain rate  
void setFillRate (double) //set tank fill rate  
double getHeight ()     //return the value of the height  
double getRadius ()     //return the value of the radius  
double getDrainRate (double) //return the value of the drain rate  
double getFillRate (double) //return the value of the fill rate  
double volume ()        //computes and returns the volume
```

```
double timeToFillEmpty()  
//computes and returns the time to fill in hr:min:sec if tank is  
empty
```

```
double timeToFillPartial(double)  
/*computes and returns the time to fill in hr:min:sec if the tank is  
partially filled from the value of the passing parameter.*/
```

```
~cylinderTank() //default destructor, no content on function body
```

3. Implement the algorithm of the function from the class `cylinderTank` then test the operation of these function on function `main()`. **Note:** Implement the content of the constructor and destructor first.