

# Object Oriented Programming Lab

## Lab 05

**Marks 10**

### Instructions

Work on this lab individually. You can use your books, notes, handouts etc. but you are not allowed to borrow anything from your peer student. *You are strictly **NOT ALLOWED** to include any additional data-members/functions/constructors in your class.*

### Marking Criteria

Show your work to the instructor before leaving the lab to get some or full credit.

### What you must do

Program the following task in your C++ compiler and then compile and execute them. *Write the **main** function first and keep testing the functionality of each function once created.*

### ADT: Student

Write a class named **Student** that has the following:

- The class should have following **five private data members**
  - An **int** named **regNo** that holds the student's **registration number**. The value of **registration number** should fall in **between 501 to 565 both inclusive, 0** otherwise.
  - A **string** named **firstName** that holds the student's **first name**.
  - A **string** named **lastName** that holds the student's **last name**.
  - A **string** named **program** that holds the student's **degree program** in which he/she is registered.
  - A **float** named **cgpa** that holds the student's **current CGPA**. The value of **cgpa** must fall in **between 0.0 and 4.00 both inclusive, -1** otherwise.
- Provide the implementation of **mutators** for all the data members (**regNo**, **firstName**, **lastName**, **program** and **cgpa**) of the class.
- Provide the implementation of **accessors** for all the data members (**regNo**, **firstName**, **lastName**, **program** and **cgpa**) of the class.
- Provide the implementation of following **constructors** and a **destructor**
  - The constructor should accept the **student's registration number, first name, last name** and **program** as arguments. These values should be assigned to the object's appropriate member variables. The constructor should also assign **-1** to the **cgpa** member variable.
  - The constructor should accept the **student's registration number, first name** and **program** as arguments. These values should be assigned to the object's appropriate member variables. The constructor should also assign **empty string ("" )** to **last name** and **-1** to the **cgpa** member variable.
  - The constructor should accept the **student's registration number, first name, last name, program** and **cgpa** as arguments. These values should be assigned to the object's appropriate member variables.
  - A **copy constructor** to initialize a student's object with already existing object.
  - A **destructor** that do nothing except displaying a simple message "Destructor executed..." on the screen.
- Provide the implementation of following member functions
  - set** method accepts **student's registration number, first name, last name, program** and **cgpa** as arguments and assigns them to the appropriate member variables.
  - read** method to **initialize the data** of a student **taken** from the user.
  - write** method to display the information of a particular student.
  - isFirstSemester** method should return **true** if the student is **enrolled in first semester** i.e., a student having **CGPA -1**, **false** otherwise.
  - getPercentage** method should provide the facility to **calculate and return the percentage** of the students' **CGPA** only if the value of **CGPA is greater than or equal to 0.0**, otherwise return **-1**.
  - isPromoted** method should return **true** if the students' **CGPA** is greater than or equal to **2.00**, **false** otherwise.
- Once you have written the class, write **main** function and test its functionality by creating some objects of **Student**.

😊😊😊 **BEST OF LUCK** 😊😊😊