Exercise 1
Class Constructors and Destructor

Duration : 60 minutes (including submission)

Exercise Materials
- Program templates are provided for this exercise. Please download from the elearning and extract the ZIP file to your local drive.
- The questions and tasks to be completed are stated in the program templates.
- You have the choice to use Microsoft VS Code, Dev C++ or any other IDEs to write the code for this exercise.

Deliverable Item
- Submit only the s**ource code** file you have edited (i.e., **exercise1.cpp**)
- The submission must be done at elearning. Other than that, e.g., email, telegram, etc. is not acceptable.

Plagiarism Policy
- Discussions among the students are still possible during the exercise session.
- However, all works must be done individually.
- Any kind of plagiarism (e.g., copy and paste code by any mean) would lead to disqualification of submissions for both parties (i.e., students that copy others' code and students that give their code to others).

Late Submission Policy
- **10% deduction for every 5 minutes late**.
- For example: if the duration of the exercise is 60 minutes, and your submission is received on the 61st minute, you are only eligible to earn 90% at maximum of the total marks.

Question

In this exercise, you will be defining a class named `Arithmetic` to model an arithmetic operation. Each arithmetic operation consists of two operands, left and right, and an operator.

For example: 5 / 2, the left operand is 5 and the right operand is 2, whereas the operator is a division.

Complete the program **exercise1.cpp** according to the following tasks:

Task 1:

Declare and define the class `Arithmetic`. You can use either inline or separation style for these tasks. The attributes have already been given in the class declaration.

Add the following methods to the class:

a. A default constructor which sets all the attributes to zero values.
b. A constructor that accepts only a parameter to set the operator.
c. A constructor that accepts three parameters to set the attributes, respectively.
d. A destructor which shows a message, for example **"The object is being destroyed"**.
e. Accessor (or getter) methods for all the attributes,.i.e. `getLeft()`, `getRight()`, and `getOper()`
f. Mutator (or setter) methods for all the attributes.
g. A method named `evaluate()` that performs the arithmetic operation depending on the operator.

Task 2:

a. In the function `main()`, create an `Arithmetic` object named `a1` using an appropriate constructor to evaluate the arithmetic division of : **5.0 / 2.0**
b. and print the result onto the screen using an appropriate method.

Task 3:

a. Create another `Arithmetic` object named `a2` using the second constructor (from Task 1(b)) to set the operator to '*' (i.e., multiplication).
b. Then, set the `left` and `right` operands for the object with the values entered from the keyboard.
c. Finally, evaluate and print the result onto the screen.

Output:

Expected result of the program is as shown in the following figure. **Bold** text indicates keyboard inputs.

```
a1 result = 2.5

Enter the operands for a2 => 3   8
a2 result = 24
```