Object Oriented Programming

Week 01
Object & Class

Department of Software Engineering-FIT-VNU-HCMUS

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Notes

Create a single solution/folder to store your source code in a week.

Then, create a project/sub-folder to store your source code of each assignment.

The source code in an assignment should have at least 3 files:

- A header file (.h): class definition, function prototypes.
- A source file (.cpp): function implementation.
- Another source file (.cpp): named YourID_Ex01.cpp (for main function). Replace 01 by id of an assignment.

Make sure your source code was built correctly before submitting.

Folder structure for submitting file "StudentID_XX.zip"

Folder named Student ID

+ Folder contains assignment 1 (.h; .cpp; …)

+ Folder contains assignment 2 (.h; .cpp; …)

…

+ Folder contains assignment n (.h; .cpp; …)
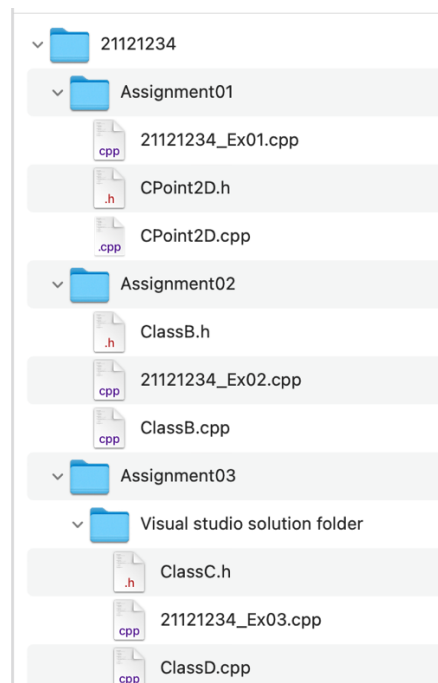
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Content

In this lab, we will review the following topics:

- Implement classes, attributes and methods in C++.

3 Assignments

A: YY: 01

H: YY: 04

Implement the following assignments in C++ language.

3.1. Fraction

Class: Fraction

Attribubtes:

1. Numerator
2. Denominator

Methods:

1. Input
2. Output
3. Add 2 fractions
4. Substract 2 fractions
5. Multiply 2 fractions
6. Divide 2 fractions. throw; if divided by zero
7. Reduce
8. Compare
9. IsPositive
10. IsNegative
11. IsZero

3.2. Triangle

Class Point.

Attributes:

1. x
2. y

Methods:

1. Input
2. Output
3. Distance from point A to point B
4. Distance to Ox
5. Distance to Oy

Class: Triangle

Attributes:

1. Point A
2. Point B
3. Point C

Methods:

1. Input
2. Output
3. IsValidTriangle
4. Type of a triangle.
    a. https://www.dkfindout.com/us/math/geometry/types-triangle/
5. Perimeter
6. Area
7. Center G

3.3. Queue / LinkedList

Class: LinkedListQueue

Attributes:

1. Node *head
2. Node *tail
3. int capacity: max number of elements in the queue
4. int num: current number of elements in the queue

Methods:

1. init(int capacity)
2. enqueue(x) / push(x)
3. int x = dequeue()
4. peek(): return the top element but do not enqueue
5. isEmpty
6. isFull
7. clear

3.4. Online shopping website app

Pickup a well-known eCommerce website/app (Tiki, Shopee, Lazada, ShopeeNow, Grab, MoMo…).
Then, list information for each class:

- At least 5 classes
- At least 5 attributes in each class
- At least 5 method in each class (excluding getters and setters)