Object Oriented Programming

Week 01
Object & Class

Cảm ơn thầy Trần Duy Quang đã cung cấp template cho môn học

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1

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

Make sure your source code was built correctly. Use many test cases to check your code before submitting to Moodle.

2

Content

In this lab, we will review the following topics:

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

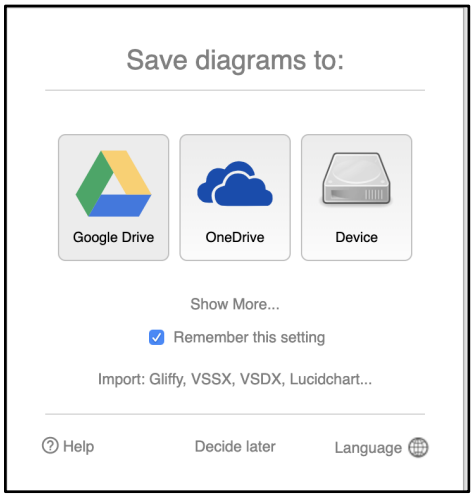
3

Basic class diagram creation in draw.io

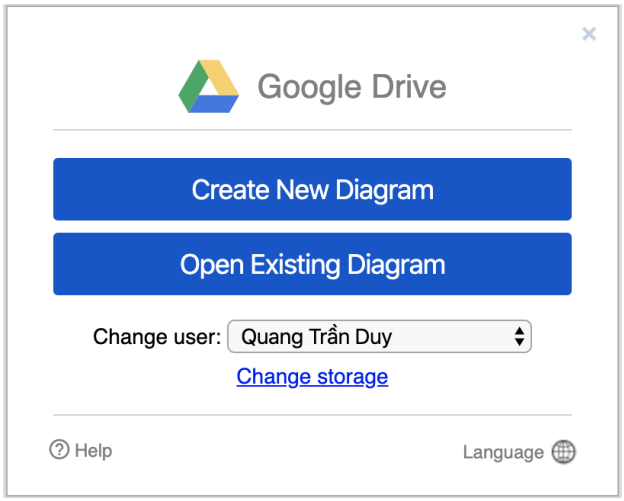
(Credit to Mr. Trần Duy Quang)

Using draw.io to create class diagram

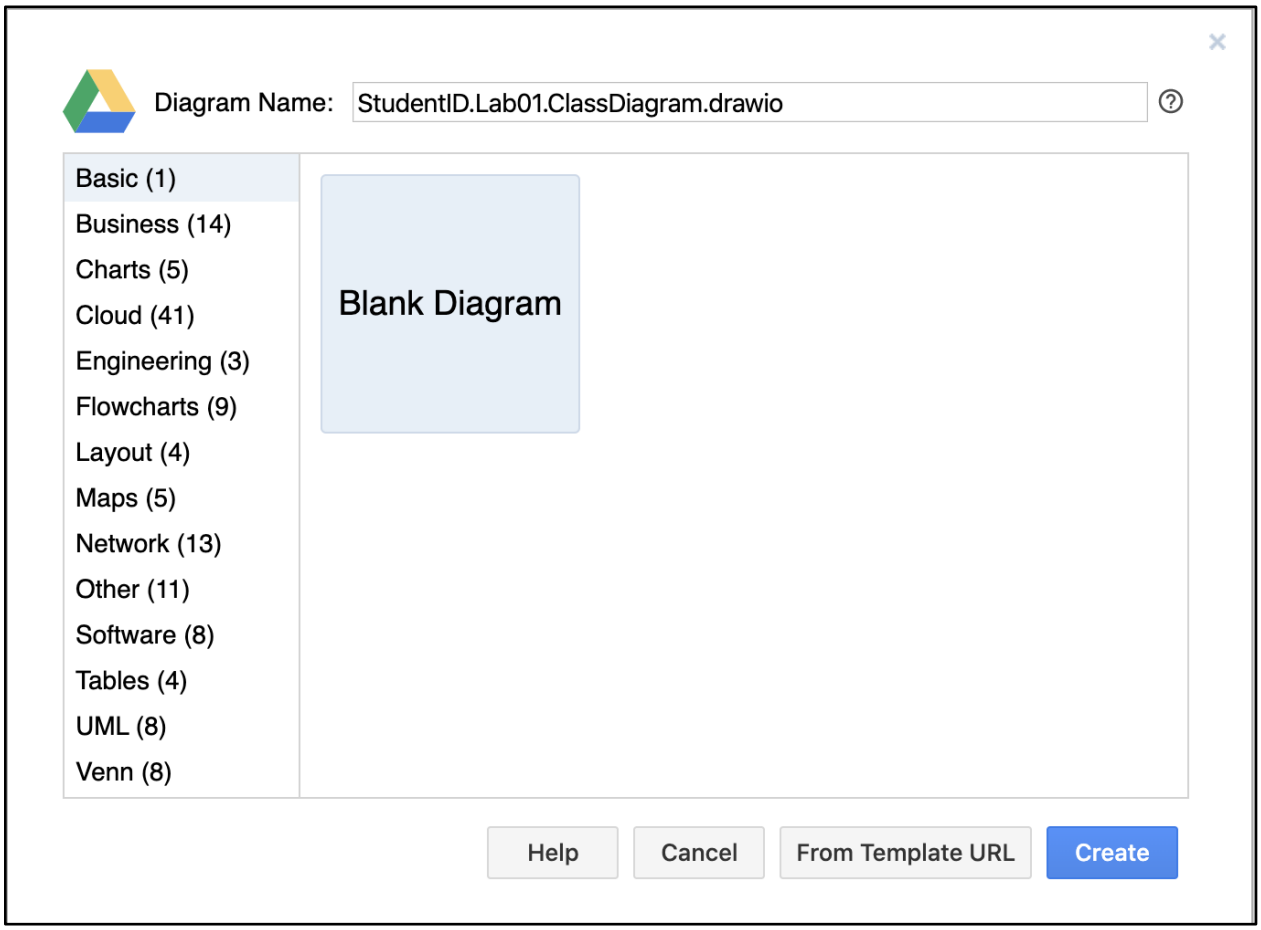
- **Step 01**: Access http://draw.io, choose to save your diagrams using Google Drive (recommended).



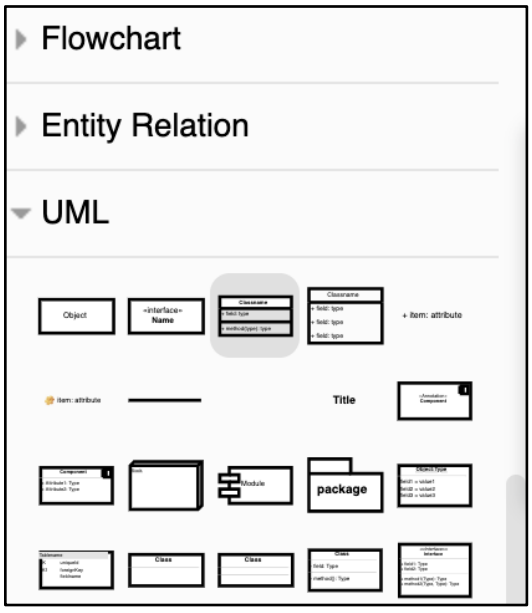
- **Step 02**: Choose **Create new diagram** to create a blank diagram.



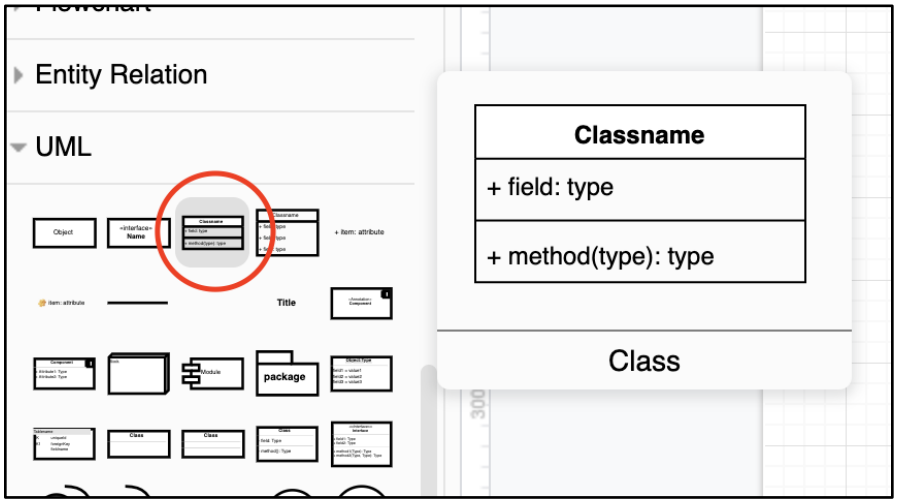
- Step 03: Create a Blank diagram, name it in the following format:



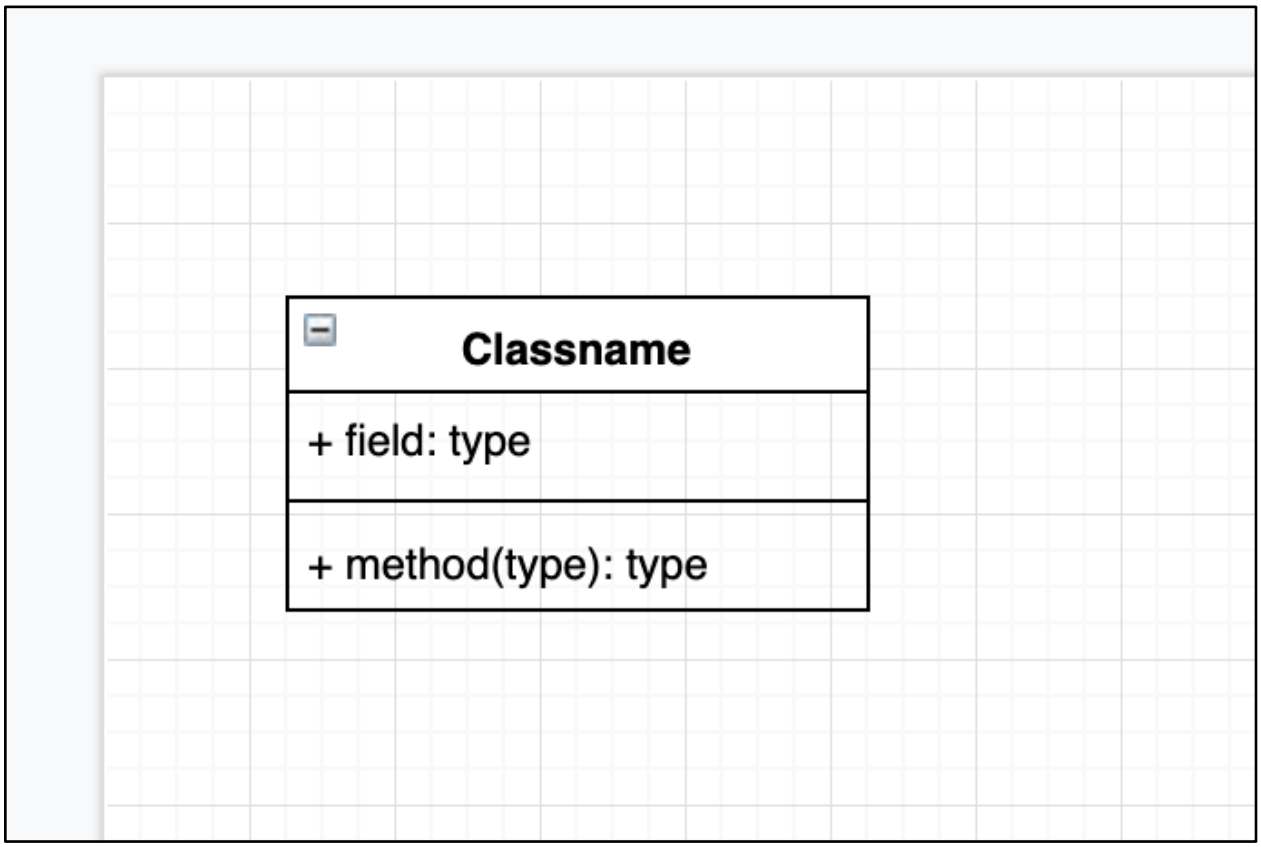
- Step 04: On the left panel, expand the UML node for all the shapes needed for creating class diagram



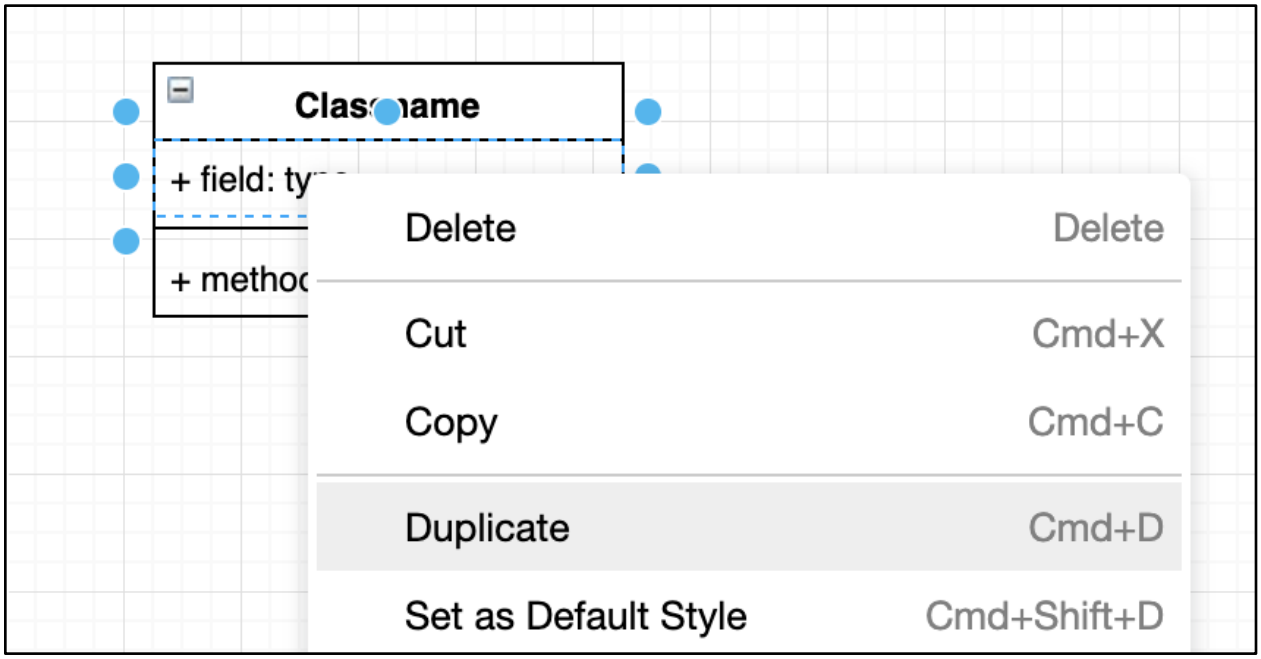
- Step 05: Create your first class diagram by choosing class

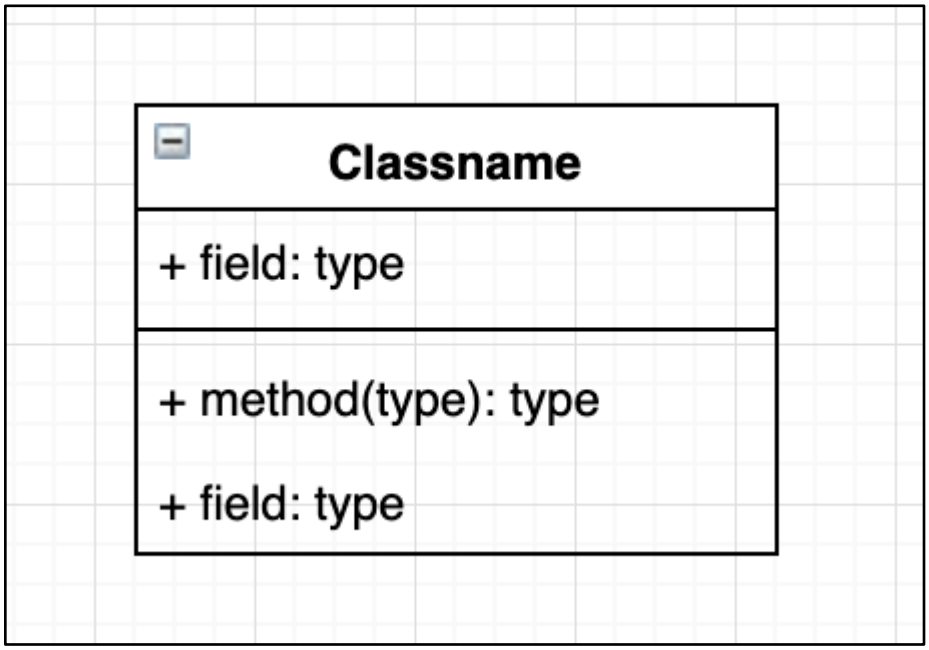


This is the default result you will see:

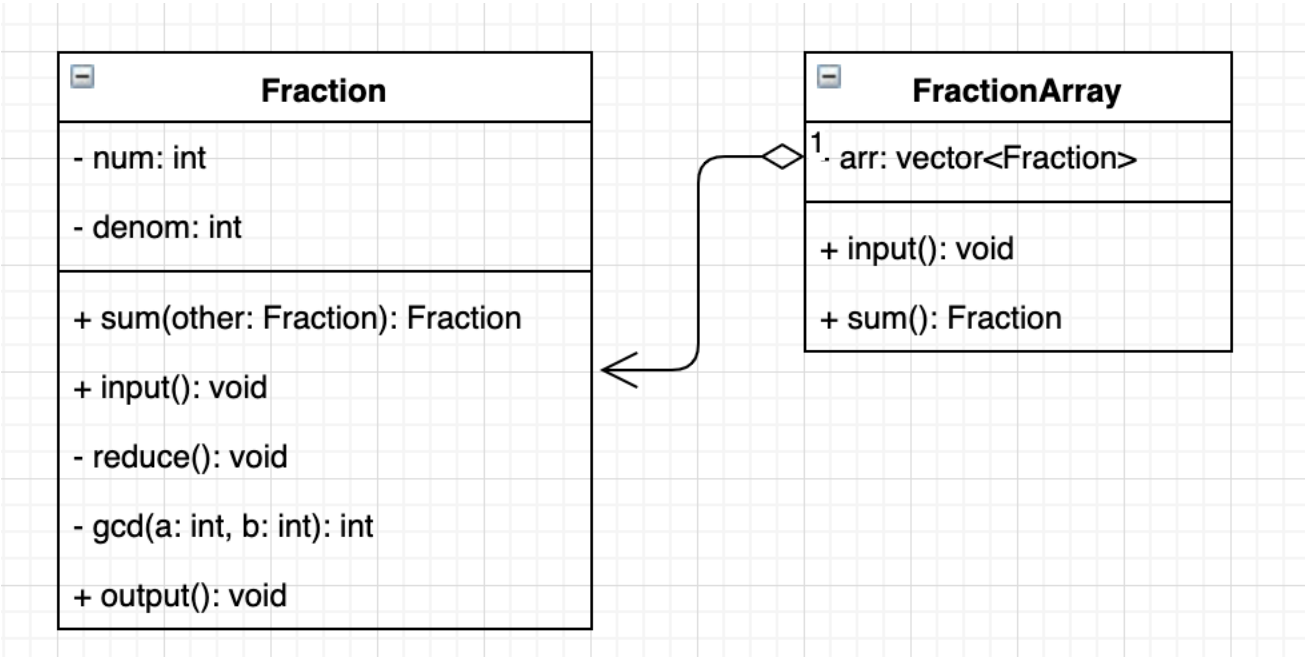


- **Step 06**: To create new attribute field, right click and choose Duplicate, then drag it into attribute section (the middle one)

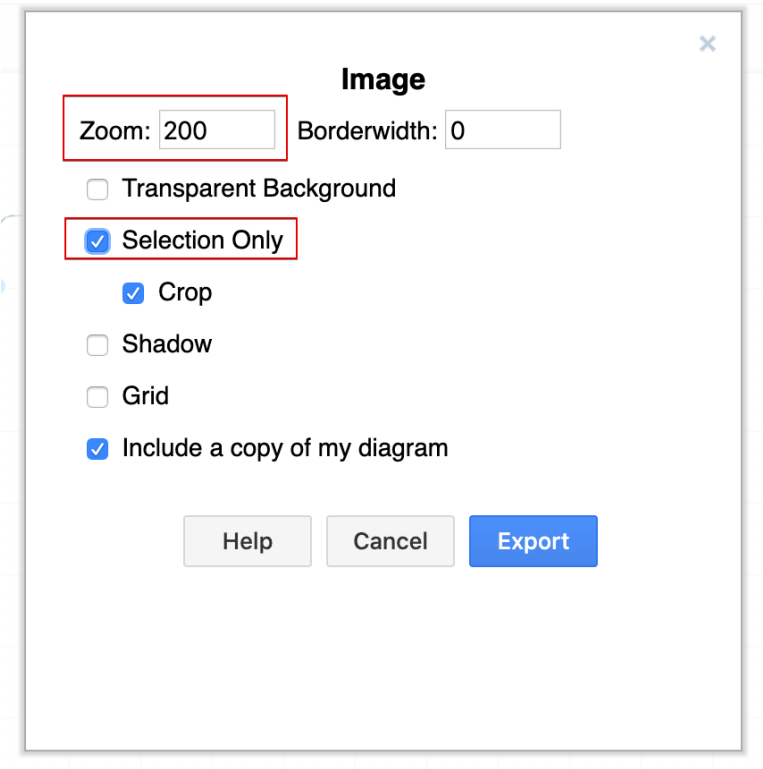


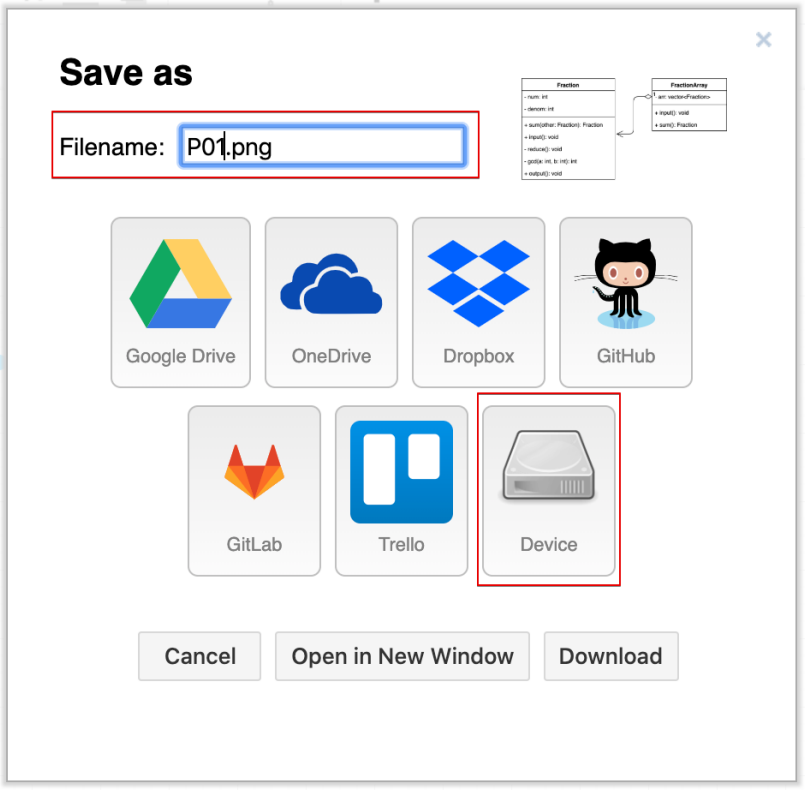


- Step 6: Here is a class diagram



- Step 7: To submit your work. Firstly, drag and select your diagram. Secondly, choose menu File – Export as – PNG. Thirdly, Zoom: 200%, Selection Only. Export. Finally, choose your local device and download.




Save as
Filename: P01.png
Google Drive
OneDrive
Dropbox
GitHub
GitLab
Trello
Device
Cancel
Open in New Window
Download

4 Assignments

A: YY: 01

H: YY: 04

Implement in C++, the following methods.

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. Stack / Array

Class: ArrayStack

Attributes:

1. int * data
2. int capacity: max number of elements in the stack
3. int top: index of top element or current number of elements in the stack

Methods:

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

3.4. Queue / LinkedList

Class: LinkedListQueue

Attributes:

4. Node *head
5. Node *tail
6. int capacity: max number of elements in the queue
7. int num: current number of elements in the queue

Methods:

8. init(int capacity)

9. enqueue(x) / push(x)
10. int x = dequeue()
11. peek(): return the top element but do not enqueue
12. isEmpty
13. isFull
14. clear