



HO CHI MINH UNIVERSITY OF SCIENCE  
FACULTY OF INFORMATION TECHNOLOGY  
SOFTWARE ENGINEERING DEPARTMENT  
ADVANCED PROGRAM IN COMPUTER SCIENCE  
COURSE: **INTRODUCTION TO CS II – KỸ THUẬT LẬP  
TRÌNH**  
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**WEEK 01**

## **ASSIGNMENT 01**

 TRƯƠNG PHƯỚC LỘC

 HỒ TUẤN THANH

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## 1 Inclass Assignment

### 1.1 Problem 01: Fraction

Define class Fraction with 2 attributes (numerator and denominator) and the following methods:

1. Simplify (reduce) a fraction
2. Input a fraction from screen/file
3. Output a fraction to screen/file
4. Add 2 fractions.
5. Divide a fraction by another fraction.
6. Update the numerator of a fraction
7. Update the denominator of a fraction.
8. Get the numerator of a fraction
9. Get the denominator of a fraction
10. Compare 2 fraction.

Write a small program using the above methods.

### 1.2 Problem 02: Complex Number

Define class ComplexNumber with 2 attributes (real number and imaginary number) and the following methods:

1. Input a complex number
2. Output a complex number
3. Add 2 complex numbers.
4. Subtract a complex number from another.
5. Find the absolute value of a complex number.
6. Test whether 2 complex numbers are equal.

Write a small program using the above methods.

## 2 Homework

### 2.1 Problem 01: Point2D

Define class Point2D with 2 attributes (x and y) and the following methods:

1. Input a point from screen/file.
2. Output a point to screen/file.

3. Update the element x of a point.
4. Update the element y of a point.
5. Get the element x of a point.
6. Get the element y of a point.
7. Calculate the Euclidean distance between 2 point.
8. Check whether a point belongs to the first quadrant.
9. Check whether a point belongs to the third quadrant.
10. Move a point to up/bottom/left/right by one unit.

Write a small program using the above methods.

## 2.2 Problem 02: Circle

Define class Circle with 2 attributes (center point and its radius) and the following methods:

1. Input a circle from screen/file.
2. Output a circle to screen/file.
3. Find the area of a circle.
4. Find the perimeter of a circle.

Write a small program using the above methods.

## 2.3 Problem 03: APCSSStudent

Define class APCSSStudent:

1. Attributes:
  - a. StudentID: a string, max length = 7 characters
  - b. Fullname: a string, max length = 30 characters
  - c. Address: a string, max length = 50 characters
  - d. Date of birth: use class DateTime from Mr Tien's assignment
  - e. Grade: 0 – 10
2. Methods:
  - a. Input a student info from screen/file
  - b. Output student info to screen/file
  - c. Classify a student based on his/her grade

Write a small program using the above methods.