Xi'an Jiaotong-Liverpool University

西交利物浦大学

Department of Electrical and Electronic Engineering

EEE102 C++ Programming and Software Engineering

Assignment2 Class and Objects[1]
SDP Report

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I certify that I have read and understood the University's *Policy for dealing with Plagiarism, Collusion and the Fabrication of Data* With reference to this policy, I certify that:

- My work does not contain any instances of plagiarism and/or collusion.

- My work does not contain any fabricated data.

By handing in my assignment for marking, I formally declare that all the above information is true to the best of my knowledge and belief.

Signature: __Zheng Sun____

[1]Last updated on March 19, 2017

1. Problem Statement:
The assignment aims to test the basic concepts about Classes and Objects and to reinforce the understanding of OOP. Overall, the object of the assignment is clear and lucid.

a) Two classes are there to be designed to <u>hold two different types of data(attributes)</u> – the Fraction type and the Complex type.

b) Methods of the two classes will need to be designed to satisfy the <u>behaviours</u> of the class.
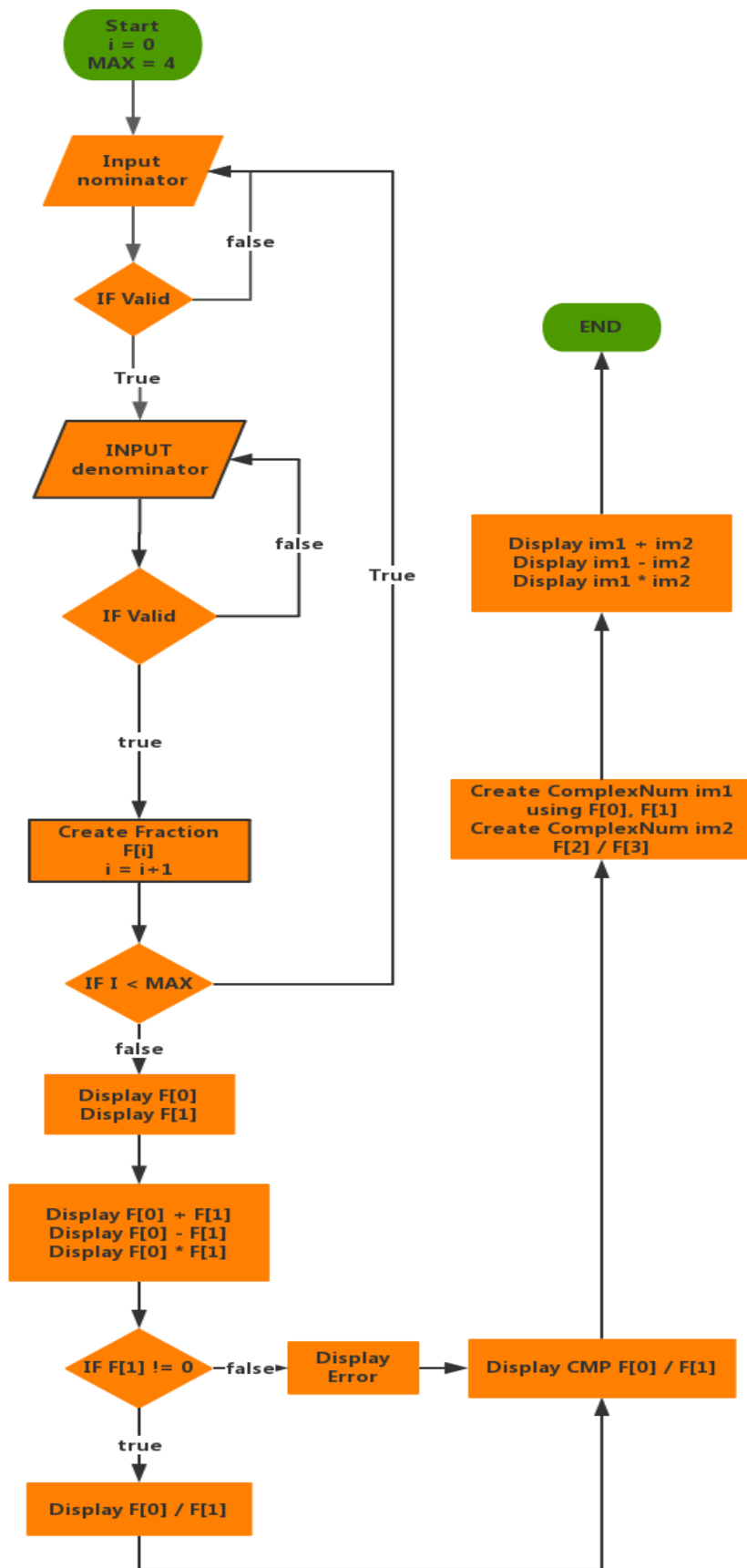
2. Analysis:

a) Inputs:
Accept 8 int type numbers in total, as to convert them to 4 Fraction Type samples (each occupies 2 inputs as nominators and denominators) or 2 ComplexNum type samples (each need 2 Fraction type to construct the real part and imaginary part).
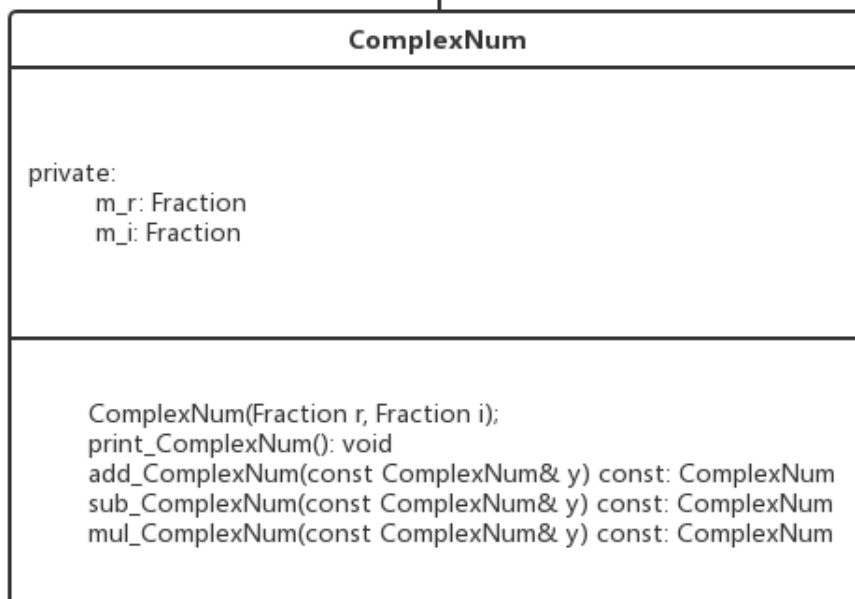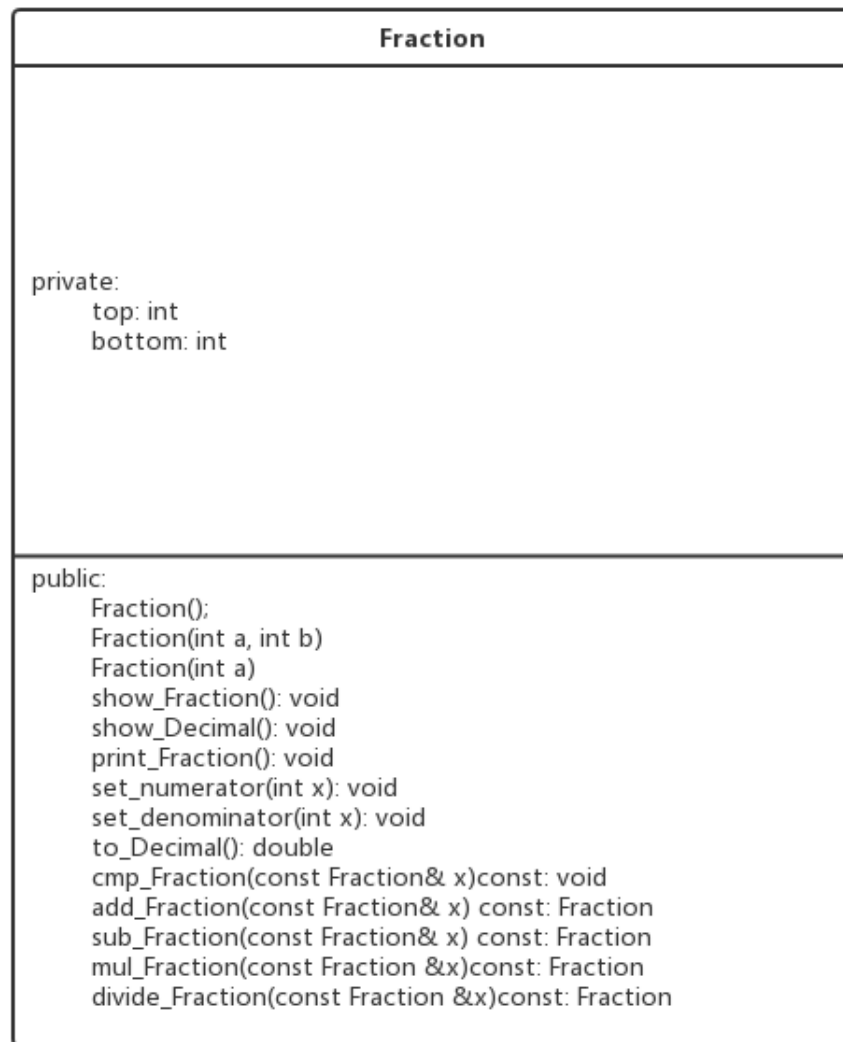
b) Output:
The demonstration of the behaviours of the class Fraction and ComplexNum as required by the client, such as addition, subtraction, multiplication, etc**.**

3. Design

a) main() function design

b) Class Design: class Fraction will be the base class for ComplexNum

Fraction

private:
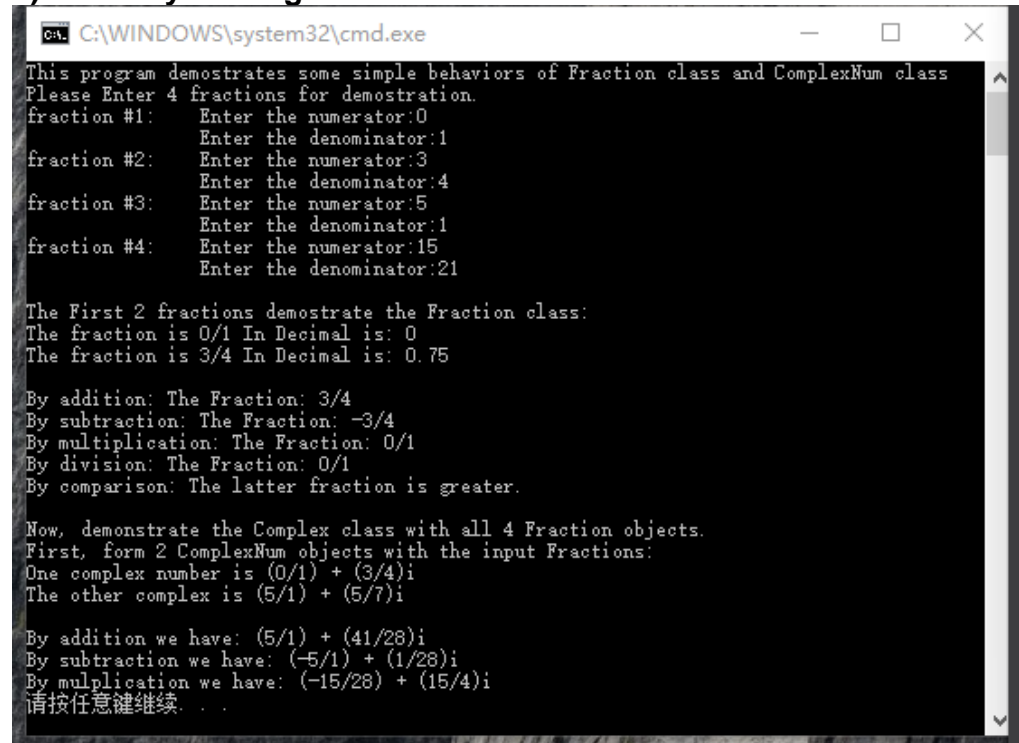   top: int
    bottom: int

public:
    Fraction();
    Fraction(int a, int b)
    Fraction(int a)
    show_Fraction(): void
    show_Decimal(): void
    print_Fraction(): void
    set_numerator(int x): void
    set_denominator(int x): void
    to_Decimal(): double
    cmp_Fraction(const Fraction& x)const: void
    add_Fraction(const Fraction& x) const: Fraction
    sub_Fraction(const Fraction& x) const: Fraction
    mul_Fraction(const Fraction &x)const: Fraction
    divide_Fraction(const Fraction &x)const: Fraction

ComplexNum

private:
    m_r: Fraction
    m_i: Fraction

ComplexNum(Fraction r, Fraction i);
print_ComplexNum(): void
add_ComplexNum(const ComplexNum& y) const: ComplexNum
sub_ComplexNum(const ComplexNum& y) const: ComplexNum
mul_ComplexNum(const ComplexNum& y) const: ComplexNum

4. Implementation:

EEE102_Assgnmet_2 _Zheng.Sun15_1507820\ClassDec.h
EEE102_Assgnmet_2 _Zheng.Sun15_1507820\MemberFunctions.cpp
EEE102_Assgnmet_2 _Zheng.Sun15_1507820\Source.cpp

5. Testing
a) Ordinary Testing

b) Erroneous Input