

EEE 102 C++ Programming and Software Engineering II

Assessment 1 SDP Report

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Problem statement:

Exercise 2 requires students to design a class which could represent a fraction. The fractions can have these functions: add, subtract, multiple and divide. In addition, it can compare the values of two fractions and has the function of inputting and outputting. Moreover, the fraction could fix its format such as $1/-2$ can be converted into $-1/2$. Lastly, the final fraction can be converted into decimals.

Model Answer – Software Development Process**Analysis**

Input:

- User input the real number and use space to separate numerator and denominator.
- Input the operation: +, -, *, /.
- Input another fraction.

Output:

- Show the marked words.
- Show the result of two fraction which have been operated.
- If this is any 0 in denominator, it will report to user.

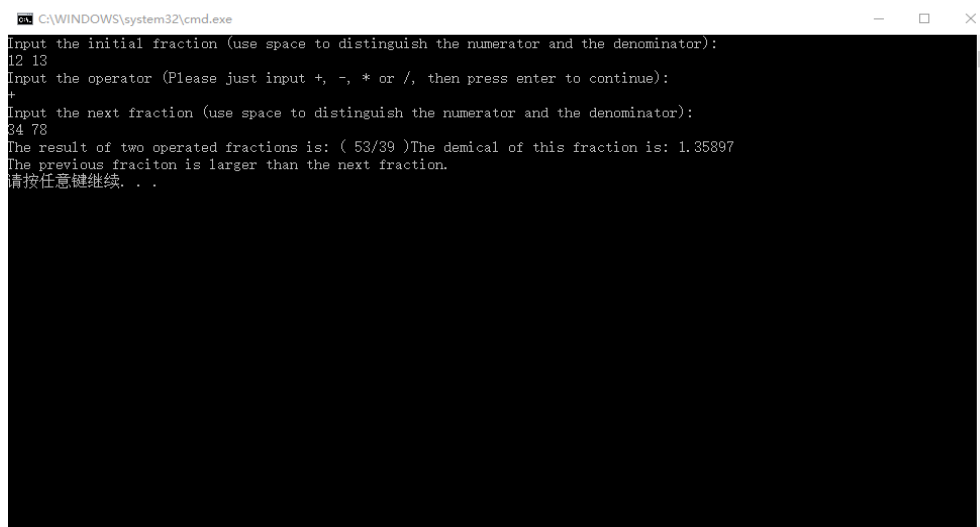
Design:

1. Create a constructor to initialize the top and the bottom.
2. Create an algorithm to realize the function of comparison.
3. Get greatest common divisor for each fraction to normalize the format of the resulting fraction.
4. Show the marked words.
5. Create menu (switch) to choose operation.

Implementation:

See the code for algorithm 1 in the file: exercise 2.cpp.

Testing:



```
C:\WINDOWS\system32\cmd.exe
Input the initial fraction (use space to distinguish the numerator and the denominator):
12 13
Input the operator (Please just input +, -, * or /, then press enter to continue):
+
Input the next fraction (use space to distinguish the numerator and the denominator):
34 78
The result of two operated fractions is: ( 53/39 )The demical of this fraction is: 1.35897
The previous fraciton is larger than the next fraction.
请按任意键继续. . .
```

Figure 1: Create two fractions and do add operation.

```
CA\WINDOWS\system32\cmd.exe
Input the initial fraction (use space to distinguish the numerator and the denominator):
13 20
Input the operator (Please just input +, -, * or /, then press enter to continue):
-
Input the next fraction (use space to distinguish the numerator and the denominator):
-23 60
The result of two operated fractions is: ( 31/30 )The demical of this fraction is: 1.03333
The previous fraciton is larger than the next fraction.
请按任意键继续. . .
```

Figure 2: Create two fractions and do subtract operation.

```
CA\WINDOWS\system32\cmd.exe
Input the initial fraction (use space to distinguish the numerator and the denominator):
12 -13
Input the operator (Please just input +, -, * or /, then press enter to continue):
*
Input the next fraction (use space to distinguish the numerator and the denominator):
23 45
The result of two operated fractions is: ( -92/195 )The demical of this fraction is: -0.471795
The previous fraciton is smaller than the next fraction.
请按任意键继续. . .
```

Figure 3: Create two fractions and do multiple operation.

```
CA\WINDOWS\system32\cmd.exe
Input the initial fraction (use space to distinguish the numerator and the denominator):
23 19
Input the operator (Please just input +, -, * or /, then press enter to continue):
/
Input the next fraction (use space to distinguish the numerator and the denominator):
56 78
The result of two operated fractions is: ( 897/532 )The demical of this fraction is: 1.68609
The previous fraciton is larger than the next fraction.
请按任意键继续. . .
```

Figure 4: Create two fractions and do divide operation.

```
CA\WINDOWS\system32\cmd.exe
Input the initial fraction (use space to distinguish the numerator and the denominator):
34 0
Do not devide by zero Error,
请按任意键继续. . .
```

Figure 5: If the top is equal to 0.

```
C:\WINDOWS\system32\cmd.exe
Input the initial fraction (use space to distinguish the numerator and the denominator):
12 67
Input the operator (Please just input +, -, * or /, then press enter to continue):
+
Input the next fraction (use space to distinguish the numerator and the denominator):
13 0
Do not devide by zero Error,
请按任意键继续. . .
```

Figure 6: If the bottom is equal to 0.