OBJECT ORIENTED PROGRAMMING I LABORATORY
Experiment # 8:
Operator Overloading

QUESTIONS

Write a class RationalNumber (fractions) with the following capabilities:

a) Define two **private double** data member (i.e num and den)
b) The constructor of the class is default constructor with values 0.0 and 1.0 for num and den. Also, you must prevent a 0 denominator in a fraction.
c) Include overloaded the addition, subtraction, multiplication and division operators for this class. **Overloaded operators must be public member functions**.
d) Include overloaded the relational and equality operators (==, !=, <, >, <=, >=) for this class. **Overloaded operators must be public member functions**.
e) Include overloaded the stream extraction operator function operator (>>) and the stream insertion operator function operator (<<) for this class. **Overloaded operators must be non-member (friend) functions**.

Test your program with following driver program.

```
#include <iostream>
#include "Rational.h" // include definition of class Rational
using namespace std;

main()
{
    Rational n1,n2,x;

    cout << "Enter rational number in the form num/den:" << endl
    cin >> n1 >> n2;

    cout << n1 << endl << n2 << endl << x << endl;

    x=n1+n2;
    cout << n1 << " + " << n2 << " = " << x << endl;

    x=n1-n2;
    cout << n1 << " - " << n2 << " = " << x << endl;

    x=n1*n2;
    cout << n1 << " * " << n2 << " = " << x << endl;

    x=n1/n2;
    cout << n1 << " / " << n2 << " = " << x << endl;


    if (n1<n2)
        cout << "n1 is less than n2" << endl;

    if (n1>n2)
        cout << "n1 is greater than n2" << endl;

    if (n1==n2)
        cout << "n1 is equal to n2" << endl;

    if (n1!=n2)
        cout << "n1 is not equal to n2" << endl;

    if (n1<=n2)
        cout << "n1 is less than or equal to n2" << endl;

    if (n1>=n2)
        cout << "n1 is greater than or equal to n2" << endl;

}
```

Use the following formulas:

Addition:
(a/b) + (c/d) = (ad + bc) / (bd)

Subtraction:
(a/b) – (c/d) = (ad – bc) / (bd)

Multiplication:
(a/b) * (c/d) = (ac) / (bd)

Division:
(a/b) / (c/d) = (ad) / (bc)

```
Enter rational number in the form num/den:
7/4
3/2
7/4
3/2
0/1
7/4 + 3/2 = 26/8
7/4 - 3/2 = 2/8
7/4 * 3/2 = 21/8
7/4 / 3/2 = 14/12
n1 is greater than n2
n1 is not equal to n2
n1 is greater than or equal to n2
```

```
Enter rational number in the form num/den:
3/2
7/4
3/2
7/4
0/1
3/2 + 7/4 = 26/8
3/2 - 7/4 = -2/8
3/2 * 7/4 = 21/8
3/2 / 7/4 = 12/14
n1 is less than n2
n1 is not equal to n2
n1 is less than or equal to n2
```

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