

CS202: Programming Systems

LAB 3: Operator Overloading

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1. Write and run the sample below

```
/* Example of overloaded + operator function for Real objects
*/
#include <iostream.h>
#include <conio.h>
class Real
{
private:
    float value;
public:
    Real(float v=0)
    {
        value=v;
    }
    Real operator+(Real &A)
    {
        float temp = real + A.real ;
        return Real(temp) ;
    }
    void display()
    {
        cout<<value;
    }
};
main()
{
    Real A(6.5);
    Real B(3.5) ;
    Real C = A+B ;
    C.display();
    getch();
}
```

2. Add other overloaded operator functions (-, *, /) to the above program.
3. Create a Matrix class including following members

Data members	Description
int n	Row of a matrix
int m	Column of a matrix
float data[][]	Data of matrix

Functions	Description
Matrix()	Constructor allows user to enter values for a matrix from keyboard
Matrix(int M, int N)	create M-by-N matrix of 0's
Matrix(float a[][])	Create matrix based on 2d array
Matrix(const Matrix &A)	Copy constructor
Matrix operator+(Matrix &B)	Addition of two Matrices
Matrix operator-(Matrix &B)	Subtraction of two Matrices
int operator==(Matrix &B)	Comparison of two Matrices
Matrix operator*(Matrix &B)	Production of two Matrices
display()	Print matrix

4. Create a Complex class including following members

Data members	Description
float real	real + j*image
float image	

Functions	Description
Complex(float r=0, float i=0)	Default constructor
Complex(const Complex &A)	Copy constructor
Complex operator+(Complex &B)	Addition of two Complexes
Complex operator-(Complex &B)	Subtraction of two Complexes
int operator==(Complex &B)	Comparison of two Complexes
Complex operator*(Complex &B)	Production of two Complexes
display()	Print Complex

5. Create a Fraction class including following members

Data members	Description
int numerator	$\frac{\text{numerator}}{\text{denominator}}$
int denominator	

Functions	Description
Fraction(int r=0, int i=1)	Default constructor
Fraction(const Fraction &A)	Copy constructor

Fraction operator+(Fraction &B)	Addition of two Fractions
Fraction operator-(Fraction &B)	Subtraction of two Fractions
int operator==(Fraction &B)	Fraction of two Fractions
Fraction operator*(Fraction &B)	Production of two Fractions
display()	Print Fraction

6. Write conversion functions to convert
 - a. a float number to Real object (ex. Real obj = 1.5)
 - b. a Fraction object to a float number (ex. float a = float(FracObj))
 - c. a Fraction object to a Real object (FracObj = RealObj)