

COEN 70: Formal Specification and Advanced Data Structures

Winter 2015

Lab 2: Operator Overloading

Write a class for complex numbers. A complex number has the form $X = a + b*i$, where a and b are real numbers and i is the square root of -1 . We refer to a as the real part and b as the imaginary part of the number. The class should have two data members to represent the real and imaginary numbers; the constructor takes two arguments to set these members. Define the following operations, given $X = a + b*i$ and $Y = c + d*i$:

- $\text{Re}(X) = a$
- $\text{Im}(X) = b$
- $X + Y = (a + c) + (b + d)*i$
- $X * Y = (a*c - b*d) + (a*d + b*c)*i$

Additionally, include all necessary methods such as default constructor, accessors, mutators, input/output.