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Complex Arithmetic in C

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This short paper (which forms part of Technical Report #109 with two other papers) describes the use of data abstraction in C to implement a complex data type. It is implemented as a class using the data-hiding facilities present in the C++ language. (See "Data Abstraction in C" by Stroustrup). Its purpose is presumably to demonstrate certain features of the C++ language and to discuss some of the ways it can be used to advantage. To this end it meets its goals, but only a few of the new features of C++ are demonstrated. These are: operator overloading, consistent initialization and creation of data objects (in the form of generic constructor functions for classes), and class structures to some degrees. My main complaint about this paper is that it is neither fish nor fowl. If this is the reader's first introduction to C++, then the examples provided are too sketchy to really get an appreciation for the power of the extensions being made to C. But for the reader who has read one of the other papers on C++, this paper will seem like an oversimplification. To its credit, it presents the text of a full program - something all too often overlooked in papers of this sort. However, the example program necessarily contains some constructs not explained in the paper. (For example the 'friend' or the 'inline' mechanism). All in all, the paper is useful for someone who has read another paper on C++ and wants to look at an example program, albeit a simple one. The example concentrates on one or two of the more easily defensible features of the language. Some of the more complicated (and in my mind, questionable constructs) are not at all exercised here. Stroustrup, in "Data Abstraction in C" states the C++ has been used to implement non-trivial programs, using its data abstraction features to advantage, but here he chooses to show a simplistic example concentrating mainly on the fact that one can define a new data type, complete with operators.