Quiz Number 4 – Solutions  
(Closed book/Closed Notes:10 minutes)  
Thursday, April 20, 2006

Question 1: Consider a class Foo which contains an int member variable val and a single Constructor which takes an int, i.e. Foo(int x) {val = x;}
(a) Write the declaration of operator+ as class method.

const Foo& operator+(const Foo& rhs) const;

(b) Write the declaration of operator+ as global function.

friend const Foo& operator+( const Foo& lhs, const Foo& rhs);

Question 2: From Question 1, I want to be able to do the following:

```c++
int main()
{
    Foo f1(7);
    Foo f2(9);
    Foo f3 = f1 + f2;
    Foo f4 = f1 + 7;
    Foo f5 = 8 + f2;
}
```

(a) As you notice, we need an operator+. How should we define it? Global function or Class method? Are both possible? Which one is preferable? Why?

Usually both (global function and class method) are possible but, in this case, the last statement mandates that you use the global function definition.

(b) What other thing(s) I might need to do in the Class definition. No code needed.

We should provide a constructor that performs default construction from an int to a Foo object to make sure that the last two statements work (7 and 8 need to be default-converted to a Foo object). You can avoid providing this constructor (from int to Foo), but then you would need to provide three global functions to make sure that all three statements above work.

Question 3: Can we overload insertion operator (“<<”) as a class method? If not, why?

We can not overload the insertion operator as a class method and, hence, it must be overloaded as a global function. This is because the left hand side of the insertion operator is a stream object (e.g., cin or cout) and we can not go back and modify that stream class.