Interview questions I

- Write a C program to reverse the words in a given string without instantiating another string buffer (e.g. "I love xyz very much" becomes "much very xyz love I")
- Write a C program to count the number of times string B appears in string A. Discuss some of the possible problems.
- Write a function to compress one row of an image. Assume every value is repeated. Given a pointer to the row of color values and the length, without instantiating another image buffer, replace the color values with the number of color values in a series followed by the color value. Return the new length of the array (e.g., [50 50 50 251 251 50 50 75 75 75 75] length = 11; becomes [3 50 2 251 2 50 4 75] with a length = 8)
- Write a function: given a char, return the bits in reversed sequence. Emphasize speed.
- Write the C++ class declaration for the following: get, set, append, insert, remove pointers in an array. Compare results, methods, and requirements between using a linked list template and an array.
- Write the output of the given C++ program. The program has base class A and derived class B, constructors, virtual destructors, virtual functions, and non-virtual functions. The program instantiates a new A, new B, and an A pointer with a new B. Each function has a cout in it.
- What is the difference betwen a virtual function and regular function in C++?
- Write the class(es) for a linked list.
- Write code for traversing a binary tree.
- What is a static variable in C++?
- If you had a class with the method "draw," and wanted sometimes to draw a circle, sometimes a rectangle, and sometimes a line, what would you do? What if I wanted to draw two different shapes?
- What are some cross-platform issues?

- What are some distributed processing issues?
- What are some Multi-threaded issues?
- What artifact is shown when a wavelet is applied to an image represented by one long row, instead of a series of rows and columns? (This was part of the interviewer's Master's thesis, I'm sure...)
- What is multiple inheritance? Is it to be avoided? Why? How do you avoid it?
- In MFC, describe the Document/View architecture. What is the first thing that happens at start-up?
- In C++, what is the difference between method overloading and method overriding?Overloading a method (or function) in C++ is the ability for functions of the same name to be defined as long as these methods have different signatures (different set of parameters). Method overriding is the ability of the inherited class rewriting the virtual method of the base class.
- What methods can be overridden in Java? In C++ terminology, all public methods in Java are virtual. Therefore, all Java methods can be overwritten in subclasses except those that are declared final, static, and private.
- In C, what is the difference between a static variable and global variable? A static variable declared outside of any function is accessible only to all the functions defined in the same file (as the static variable). However, a global variable can be accessed by any function (including the ones from different files).
- In C, why is the void pointer useful? When would you use it? The void pointer is useful becuase it is a generic pointer that any pointer can be cast into and back again without loss of information.
- What are the defining traits of an object-oriented language? The defining traits of an object-oriented langauge are:

    encapsulation

inheritance

polymorphism