Due date
Wednesday, September 4, 2013

Program objectives
The objectives of this assignment are as follows.
An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution (ABET b).

Value
This program is worth 12 points. The distribution of points will be as follows.

Criterion	Value
Problem 1	6
Problem 2	2
Problem 3	4

Delivery Method
Turn in a hardcopy at the beginning of class on the due date.

Problems

1. Find the Big-O approximation of the following expression. **BE CERTAIN TO SHOW EACH STEP AND THE BIG-O RULES USED IN ORDER TO GET FULL CREDIT**. I suggest you break the expression into subexpressions separated by low precedence operators, simplify the subexpressions, then use the max rule on what's left. Be very neat and concise. I suggest you use the style I showed in class, where the justification for each step is shown at the right margin of that step. Please used lined paper or TYPE to keep the rows aligned. 6 pts
   $f(n) = \sqrt[3]{n+233}\lg(n^9)\ \sqrt[3]{411n^2} + (7n^{11} + 14n^5\ 2n)/((54n^2)^5 + 70n) + 9\lg(n^2 + 3\lg(n^n))$

2. Given: $f(n) = n^{4/3}(\lg 4)n^{1/2}$
   For each of the $g(n)$ below, circle all in which $f(n) = O(g(n))$ 2 pts
   (a) $g(n) = 4n^2\lg n$ (b) $g(n) = 2^n$ (c) $g(n) = 2n^{3.5}$ (d) $g(n) = (4^3 n)$

3. Show (a) the exact number of operations and (b) the Big-O estimate of the following: 4 pts

```
void func(unsigned long n)  // n is a large, positive number
{
    int x=1, y=x--, z=--y+x;
    for(; z<n; ++x, ++y, z*=2)
    {
        if(x>z || z<y || !z)
             z=n/3;
        else
             z=n-1;
    }
}
```