Homework Assignment 1

(100 points)

Assigned Date: Wednesday, September 22, 2010

Due Date: 5:30 PM Wednesday, September 29, 2010

> ## Your answer must show your work to avoid zero points.

Educational Goal

Become familiar with Asymptotic Analysis (O, Ω, Θ).

Questions

1. (50%) Using the rules specified by the lecture notes, calculate the complexity function for the following code fragments, and determine the Big-Oh of the function.

    (a)   ```
sum = 0;

for (i =0; i < 3; i ++)

        for (j =0; j < n; j++)

                sum ++;
```

    (b)     ```
x = getInput();

passCnt = 0;

if x<60

        Print("Failed.");

else

        passCnt++;

        Print("Passed.");
```

2. (50%) For each of the following pairs of functions, either f(n) is in O(g(n)), f(n) is in Ω (g(n)), or f(n) is in Θ (g(n)). For each pair, determine which relationship is correct.

    (a) $f(n) = \log n^2$; $g(n) = \log n + 5$

    (b) $f(n) = n\log n + n$; $g(n) = \log n$

```
(c) f(n) = 10; g(n) = log10
```

Submission Requirements

1. Must type your answer (we do not accept handwritten solution).
2. Turn in the paper copy and soft copy of the assignment. Submit a softcopy of the file through your UMassOnline account at http://boston.umassonline.net/index.cfm. Submit the paper copy along with the cover page in class. Paper copy should be bound firmly together as one pack (for example, staple, but not limited to, at the left corner). 5 points will be deducted for unbounded homework.
3. Name your file with CS310_ lastname_firstname_hw1. For example, student John Smith should name his file as CS310_Smith_John_hw1.
4. No hard copies or soft copies results in 0 points.