CS4104 Fall 2010 Homework Assignment 3
Due at 11:00pm on Wednesday, September 15
50 Points

Pledge: I (we) have not received unauthorized aid on this assignment. I (we) understand the answers that I (we) have submitted. The answers submitted have not been directly copied from another source, but instead are written in my (our) own words.

1. [15 points] Use subtract-and-guess or divide-and-guess to find the closed form solution for the following summation. You must first find a pattern from which to deduce a potential closed form solution, and then prove that the proposed solution is correct.

$$\sum_{i=1}^{n} 1/2^i$$

2. [15 points] Use subtract-and-guess or divide-and-guess to find the closed form solution for the following summation. You must first find a pattern from which to deduce a potential closed form solution, and then prove that the proposed solution is correct.

$$\sum_{i=1}^{n} i/2^i$$

3. [20 points] Consider the following code fragment.

```
sum = 0; inc = 0;
for (i=1; i<=n; i++)
  for (j=1; j<=i; j++) {
    sum = sum + inc;
    inc++;
  }
```

In class, we found its running time.

(a) Determine a summation that defines the final value for variable `sum` as a function of n.

(b) Determine a closed-form solution for your summation.