# Homework Assignment #1

Posted on Sunday, 4/3/2016.
Due 10PM, Monday, 4/11/2016.

1. (25 points) Modify Problem 3-3 in the textbook by squaring every function in columns 1, 3, and 5. Solve this problem for the functions in the second and third rows. Justify your answers.

2. (25 points) In the following, the functions $F_1(n)$, $F_2(n)$, ..., $F_6(n)$ and $G_1(n)$, $G_2(n)$, ..., $G_6(n)$ refer to the functions in the first and fourth rows, respectively, in Problem 3-3 in the textbook.

   Simplify the following six functions as much as possible in terms of the asymptotic Theta notation. Justify your answers.

   1) $F_1(n) + G_1(n) \times G_2(n)$
   2) $F_2(n) \times \log(G_2(n)) + (G_4(n))^3$
   3) $F_3(n) + G_3(n) + \log(G_6(n))$
   4) $F_4(n) \times (G_4(n))^3 + F_3(n)$
   5) $F_5(n) \times F_6(n) \times G_6(n) + F_2(n)$
   6) $2^{G_5(n)} + F_3(n)$

3. (25 points) Problem 3-5 in the textbook.

4. (25 points) Modify Problem 3-6 in the textbook by adding 2 to each value of c in the table. Solve parts a, c, e, g, h. Prove your answers.