COT 5407 Introduction to Algorithms
Homework 3

Due *in my office ECS 212b* on Monday, December 11, 2017

This homework covers Ch 15,16,25

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1. [10 points] A string w of parentheses (and) and brackets [and] is balanced if it satisfies one of the following conditions:

   - w is the empty string.
   - w = (x) for some balanced string x
   - w = [x] for some balanced string x
   - w = x y for some balanced strings x and y

   For example, the string $w = ([()][]())[()()]()$ is balanced, because $w = xy$, where $x = ([()][]())$ and $y = [()()]()$. Describe and analyze an algorithm to compute the length of a longest balanced subsequence of a given string of parentheses and brackets. Your input is an array $w[1 \ldots n]$, where $w[i] \in \{(,), [,]\}$ for every index i.

2. **[10 points]** Solve exercise 15.1-5 from Cormen.

3. **[10 points]** Solve exercise 15.2-1 from Cormen.

4. **[10 points]** Solve exercise 15.4-1 from Cormen.

5. **[10 points]** Solve exercise 15.4-3 from Cormen.

6. **[10 points]** Solve exercise 16.1-1 from Cormen.

7. **[10 points]** Solve exercise 16.2-5 from Cormen.

8. **[10 points]** Solve exercise 16.3-3 from Cormen.

9. **[10 points]** Solve exercise 25.1-5 from Cormen.

10. **[10 points]** Solve exercise 25.2-1 from Cormen.