Homework 2
Fundamental Algorithms, Spring 2008, Professor Yap

Due: Wed Feb 20, in class.

INSTRUCTIONS:

- Please read questions carefully. When in doubt, please ask. You may also post general questions to the homework discussion forum in class website. Also, bring your questions to recitation on Monday.
- There are links from the homework page to the old homeworks from previous classes, including solutions. Feel free to study these.

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1. (4 Points)
   Exercise A.3 in Lecture 1. (De Morgan's Law applied to quantifiers)
2. (10 Points)
   Exercise 7.6, Lecture 1. (Redoing question from hw1, with new assumptions)
3. (12 Points)
   Exercise 0.2, Lecture 2. (Sensitivity to initial conditions)
4. (10 Points)
   Exercise 2.8, Lecture 2. (Google problem)
5. (0 Points)
   Exercise 3.1, Lecture 2.
6. (18+5 Points)
   Exercise 6.1, Lecture II. (Polynomial- or exponential-type sums)
7. (10 Points)
   Use the Rote Method to solve the following $T(n) = 11T(n/3) + n^2$ You must indicate clearly the EGVS steps.
8. (20 Points)
   Use Real Induction to give good upper and lower bounds on the recurrence $T(n) = T(n/2) + T(n/3) + T(n/4) + n$. HINT try different values of α, β to get bounds of the form $K'n^\alpha \leq T(n) \leq Kn^\beta$ (ev.)