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Cpts 350

HW 1

1. a) {n: n=pq}

   b) {n: n=pq, for p and q are prime numbers}

   c) {A: A accepts w}

   d) {w: w is accepted by A}

2. 1. $2n^3 - 18n \leq cn^3 \leq cn^4$ => $2 \leq c \leq cn$

      $2n^3 - 18n \leq cn^2 \log n$ => $2n \leq c$ #contradiction

   2. $3n^2 2^{2n} \leq 2^{cn}$ => $\log 3n^2\, 2^{2n} \leq cn$

3. I think using the methods of data mining is a good approach. Classify the characteristics, regress them, cluster them, and do summarization and link analysis. After this process, we can know which characters of two maps are similar and which characters are not.

Bonus.

Actually, nXn multiplication is $O(n^2)$ since the worst case is when you multiply n number of integers n times and add them up. Its best case is $\Omega(1)$ which is multiplying whole thing at once. For instance, 123456789x123456789 can be multiplied at once as 1x1 can be multiplied at once. That means, it is impossible to make the calculating process faster than 1, but it is possible to make the process faster as close to 1. Well, it is impossible to make the process twice faster when n=1 which is the best case.