CS 405

Summer Quarter 2018

Homework 1

Due: Monday, July 2[[1]](#footnote-1)

1. Prove by appeal to the formal definition that , trying to make the necessary constants minimal and elegant.
2. Suppose we have the recurrence and we assume (guess) that. Derive a contradiction from this assumption, showing the derivation.
3. Consider the recurrence defied by
   1. Find an exact closed form expression for this recurrence, i.e., an exact solution to the recurrence.
   2. Prove by induction that your proposed closed form is correct.
4. Give the value of but, of course avoid unnecessary arithmetic operations by bringing to bear what you know about sums. Show the derivation
5. Formalize using sigma notation:
6. Derive a closed form for the summation in problem 5 above, showing the derivation.

1. Due in class, on paper, and typeset using LaTeX or the Microsoft Equation Editor. Note that your answers will be evaluated according to their (1) accuracy, (2) clarity and (3) elegance. [↑](#footnote-ref-1)