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CSCI-B 403

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Worked with: No one

Homework 1

1. Show that
   1. Base Case
      1. n = 1
   2. Inductive Hypothesis
      1. Assume equality is true when n = i
   3. Inductive Step
      1. Test if equality holds when n = i + 1
2. Let and . Show that .
   1. If
   2. If
   3. The inequality above is satisfied by every value of n when .
3. Let be any positive constant. Show that Show that .
   * 1. Every element in the numerator is less than its corresponding element in the denominator, will satisfy the equality for all values of n.
4. Show that but
   * 1. If
     2. The above is not possible for all values of n, as . This means for all possible values of c, there will be a value for n that does not satisfy the final inequality.
     3. If
     4. For all values of , the initial inequality is satisfied for all values of n.
5. Count the number of operations in the below code as precisely as you can, and give its best asymptotic complexity T(N).
   1. The given code will not perform any operations because i is initialized to 1 and j is initialized to 1. In the loop initializing j, j is said to be less than i, which is not true. Therefore, the code within that loop will not be entered and the value for count will not change.
   2. Time complexity: