SC205- Discrete Mathematics

Home Work 6

Tutorial Discussion Week: February 24, 2020

(1) The **ternary search algorithm** locates an element in a list of increasing integers by successively splitting the list into three sublists of equal (or as close to equal as possible) size, and restricting the search to the appropriate piece. Specify the steps of this algorithm.

(2) Explain what it means for a function to be $O(1)$.

(3) Let k be a positive integer. Show that $1^k + 2^k + \ldots + n^k = O(n^{k+1})$.

(4) Show that $3x + 7 = \Theta(x)$.

(5) Give a big-O estimate for $(n \log n + n^2)(n^3 + 2)$.

(6) Give a big-O estimate for $n \log(n^2 + 1) + n^2 \log n$.