CSC373 Worksheet 0

July 18, 2020

1. **CLRS 4.3-1:** Show that the solution of $T(n) = T(n-1) + n$ is $\mathcal{O}(n^2)$.
2. **CLRS 4.3-2:** Show that the solution of $T(n) = T(\lceil n/2 \rceil) + 1$ is $\mathcal{O}(\lg n)$.
3. **CLRS 4.3-3:** We saw that the solution of $T(n) = 2T(\lfloor n/2 \rfloor) + n$ is $O(n \lg n)$. Show that the solution of this recurrence is also $\Omega(n \lg n)$. Conclude that the solution is $\Theta(n \lg n)$.
4. **CLRS 4.3-5:** Show that $\Theta(n \lg n)$ is the solution to the "exact" recurrence (4.3) for merge sort.
5. **CLRS 4.3-6:** Show that the solution to $T(n) = 2T(\lfloor n/2 \rfloor + 17) + n$ is $O(n \lg n)$.