

Assignments: Submit answers to 5 problems

Answer any 5 problems among these four slides

- Complete the proof $T(n) = O(n \log h)$ and find the best constant in big-O.
- Consider a set of 2D linear constraints $\{a_i x + b_i y \leq c_i, i = 1, 2, \dots\}$. Given a point (x^*, y^*) How do you prove it satisfies all the constraints or find a violating inequality?
- What is the time complexity of the above question?
- Consider a computer system of memory size \sqrt{n} and hard disk size n . How do you maintain a database which always maintains the operations of finding-median, insertion and deleting median operations. Or do it with the best complexity you can achieve.

Assignments II

- Design a streaming algorithm to find the sorted list of n numbers following the negative exponential distribution.
- Consider a series-parallel graph, design your database for shortest path query on this graph
- Given railway schedule of trains, design your database for the best arrival time query
- Consider any interesting query of the above train problem, show your solution.
- How to do handle delays of trains in updating your database?

Assignment

This is one problem

Find better algorithm to find median w.r.t. better time complexity, or storage, or approximation than that of the delivered algorithm, which was published in 1980

Assignment

These are three problems

To introduce

- Define Optimal Spanner.
- Time and Complexity to find it?
- What about other updates, such as an added edge?