

CSC 226: Summer 2018: Lab 5

Midterm Review

June 12, 2018

Asymptotic Notations: Big Oh, Big Omega, Little Oh, Little Omega, Big Theta; Rules of Big Oh; functions in order of growth

Sorting: Selection Sort; Insertion Sort; Quick Sort; Mergesort; heapsort; Radix-sort; Shellsort; Bubble sort; Shaker sort

Discrete and Combinatorial maths: Permutation; Combinations; Binomial Theorem; Combinations with repetition; Pigeonhole principle; Posets

Sorting lower bound: Proof, decision tree

BST: Insertion, Deletion; insertion and deletion in 2-3 trees; Height of 2-3 tree; proofs on 2-3 trees

Red-Black Trees: 1-1 correspondence with 2-3 trees with proof; insertion in RBT, left and right rotations, flipping colors; deletion from RBT

Graphs: Graph terminologies (e.g., walks, paths, strongly connected components, DAGs etc.); Proof of degree sum; Euler circuits; Trees and Forests

MST: edge weighted graphs; edge weighted adjacency lists; MST definitions; Prim's algorithm, cycle property, cut property, pseudocode, proof of correctness, eager implementation; Kruskal's algorithm; Borůvka's algorithm