CS 261-020
Data Structures

Lecture 18
Final Exam Review
Closing Remarks
3/10/22, Thursday
Odds and Ends

• Assignment 5 due Sunday midnight
• Okay, I changed my mind…
  • No Quiz this week!

• Demo your assignment 4 by tomorrow!
Lecture Topics:

- Final
- Midterm Review
- Closing Remarks
Midterm

• 3/18 Friday during 9:30 – 10:50 am
• Same classroom
• Close book, close notes
• No calculator allowed
• Question types: multiple choices, T/F, short answer
  • Similar to the Midterm Exam
• Bring pencil/pen, and your photo ID (student ID/driver license/passport)
• Scratch paper will be provided upon request
Final

• Topics: Week 5-9 (lecture 9-16):
  • Binary Search Trees
    • Tree vs. Binary Tree
    • BST Operations and their complexity:
      • Finding an element
      • Inserting an element
      •Removing an element
  • Traversal
    • DFS: Pre-order vs. in-order vs. post order
    • BFS: level order
Final

• Topics: Week 5-9 (lecture 9-16):
  • AVL Tree
    • Balance factor of a node
    • Single rotation vs. double rotation
    • Runtime complexity of AVL tree operations
  • Priority Queues
    • Array-based heap (min/max heap)
    • Operations:
      • Insert, remove
      • Percolations
    • Build a heap from an arbitrary array
    • Heapsort
  • Map and Hash table
  • Graph
• Topics: Week 5-9 (lecture 9-16):
  • Map and Hash table
    • Hash functions
    • HT operations and their runtime complexity:
      • lookup
      • Insert
      • Remove
    • Resolve Hash collisions
      • Chaining
      • Open Addressing
  • Load factor
  • Tombstone
Final

• Topics: Week 5-9 (lecture 9-16):
  • Graph
    • Representation: adjacency list vs. adjacency matrix
    • Single source reachability
    • DFS vs. BFS in graph
    • Single source lowest-cost paths
      • Dijkstra’s Algorithm
Be Confident...

Now you are able to...

• Describe the properties, interfaces, and behaviors of basic abstract data types
• Read an algorithm or program code segment and analyze the time complexity.
• State the time complexity of the fundamental operations associated with a variety of data structures.
• Recall the space utilization of common data structures in terms of the long-term storage needed to maintain the structure, as well as the short-term memory requirements of fundamental operations, such as sorting.
• Design and implement general-purpose, reusable data structures that implement one or more abstractions.
• Compare and contrast the operation of common data structures in terms of time complexity, space utilization, and the abstract data types they implement.
Final Remarks...

• Thank you so much for your commitment to this course

• Future improvements?
  • MyOSU → Student Records →

• ULA position
  • Contact me! And apply through: https://jobs.oregonstate.edu/postings/103887
Final Remarks...

• Submit all your work by the deadline
  • Assignment 5

• Final exam on Friday, 3/18 9:30 am
  • Bring your photo ID

• Grade disputation:
  • By 3/20 6pm