University of Nevada, Las Vegas Computer Science 477/677 Fall 2026

Study for Examination October 29, 2026

1. Cuckoo hashing.
2. What is the asymptotic time complexity of these code fragments, in terms of n? Substitution may be needed.
3. Find asymptotic solutions to these recurrences using:
   (i) The master theorem.
   (ii) Akra Bazzi theorem.
   (iii) Anti-derivative methold.
   (iv) Using substitution with any of the above.
4. Graphs and directed graphs.
   (i) Connected graphs.
   (ii) Strongly connected graphs.
   (iii) Binary trees.
   (iv) Planar graphs.
   (v) DFS algorithm for finding strong components.
5. Write C++ code for a dynamic program which computes a solution to some problem?
6. Dynamic Programming and Memoization. How many memos do we need for an example problem?
7. Write C++ code for an implementation of a binary tree, or of a a queue or stack using either an array or a linked list.
8. Kruskal's algorithm, but not union/find.
9. Walk through Dijkstra's algorithm.
10. Walk through the A* algorithm.
11. Walk through Johnson's algorithm.
12. Treaps. Walk through insertions, showing roatations.
13. What is the asymptotic time complexty of some of the algorithms introduced this semester?
14. Because of poor performance on the last test:
    (i) Pseudocode for the Bellman/Ford algorithm
    (ii) Pseudocode for the Floyd/Warshall algorithm