40 Lecture - CS301

Important Subjective

1. What is a skip list?

Answer: A skip list is a probabilistic data structure that allows efficient searching, insertion, and deletion operations in a sorted sequence of elements.

- How does a skip list differ from a linked list? Answer: A skip list differs from a linked list in that it allows for logarithmic search time by adding layers of pointers to the underlying linked list.
- 3. What is the time complexity of searching in a skip list? Answer: The time complexity of searching in a skip list is O(log n).
- 4. What is the advantage of using a skip list over a binary search tree? Answer: The advantage of using a skip list over a binary search tree is that it requires less memory overhead and is simpler to implement.

5. How is a skip list constructed?

Answer: A skip list is constructed by layering multiple levels of nodes on top of a linked list, where each level skips over nodes in the lower levels with a certain probability.

6. What is the maximum number of levels in a skip list? Answer: The maximum number of levels in a skip list is typically O(log n).

7. How are nodes inserted into a skip list?

Answer: Nodes are inserted into a skip list by first searching for the correct position in the lowest level, then flipping a coin to determine if the node should be promoted to a higher level.

8. How are nodes removed from a skip list?

Answer: Nodes are removed from a skip list by first searching for the node to be removed, then updating the pointers of the surrounding nodes to bypass the node to be removed.

9. Can a skip list be used to implement a priority queue? Answer: Yes, a skip list can be used to implement a priority queue by maintaining the elements in sorted order.

10. What is the space complexity of a skip list?

Answer: The space complexity of a skip list is O(n log n).