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.

2. **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).