42 Lecture - CS301

Important Subjective

1. **What is collision in hash tables?**
   Answer: Collision in hash tables occurs when two or more keys hash to the same index.

2. **How can we resolve collisions in open addressing?**
   Answer: In open addressing, we resolve collisions by probing through the table and finding an empty slot to store the collided key.

3. **What is chaining in hash tables?**
   Answer: Chaining is a technique used to resolve collisions in hash tables by storing the collided keys in a linked list at the hashed index.

4. **What is the load factor in hash tables?**
   Answer: The load factor in hash tables is the ratio of the number of keys stored to the total number of slots in the hash table.

5. **What is rehashing in hash tables?**
   Answer: Rehashing is the process of increasing the size of the hash table and redistributing the keys in order to reduce the load factor and maintain O(1) average time complexity.

6. **What is the worst-case time complexity of hash table operations?**
   Answer: The worst-case time complexity of hash table operations is O(n), where n is the number of keys stored in the hash table, but in practice, hash tables have an average-case time complexity of O(1).

7. **What is the difference between linear probing and quadratic probing?**
   Answer: Linear probing resolves collisions by probing the next slot in the table, while quadratic probing uses a quadratic function to determine the next slot to probe.

8. **How do you calculate the load factor of a hash table?**
   Answer: The load factor of a hash table is calculated by dividing the number of keys stored by the number of slots in the table.

9. **What is the worst-case time complexity of searching in a hash table?**
   Answer: The worst-case time complexity of searching in a hash table is O(n), but in practice, searching has an average-case time complexity of O(1).

10. **What is a perfect hash function?**
    Answer: A perfect hash function is a hash function that generates unique indices for every key, so there are no collisions.