Interview Preparation

Client interview preparation plan

A) System design

1. Solve the questions you already have (coffee machine listed below)
    a. Video tutorial can be found here
2. Try to find similar system design tasks and solve them (example: the ticketing system in the back, elevator system, etc)

Example of system design:

1. **Elevator**: try to simplify the requirement if you find it complex
- https://medium.com/@kunal_15600/elevator-system-design-case-1-736b6e32fdf0
- https://thinksoftware.medium.com/elevator-system-design-a-tricky-technical-interview-question-116f396f2b1c
- https://medium.com/geekculture/system-design-elevator-system-design-interview-question-6e8d03ce1b44

Important Side Topics: Threads, mutual exclusion, semaphore, dead locks

mutual exclusion: https://www.geeksforgeeks.org/mutual-exclusion-in-distributed-system/

Semaphore: https://www.geeksforgeeks.org/semaphores-operating-system/

Mutex VS Semaphore: https://www.tutorialspoint.com/mutex-vs-semaphore

Deadlock:https://www.geeksforgeeks.org/operating-system-process-management-deadlock-introduction/

Threads: https://www.geeksforgeeks.org/operarting-system-thread/
https://www.geeksforgeeks.org/operating-system-threads-types/

Concurrency and Threads in iOS: https://www.viget.com/articles/concurrency-multithreading-in-ios/

B) Algorithms: make sure to solve questions as much as you can and make sure to cover below topics to use as solutions (these are just example, should practice more algorithms questions on leet code Link that containts alot of questions ranging Easy/Medium/Hard):

1. Trees
2. Linked list
3. Stack, queue
4. Recursion
5. Brute force algorithms
6. Review sort/search algorithms , etc

Coffee Machine

Design a coffee machine (Desktop application) that has multiple users and a server that has multiple resources (Milk (Hot/Cold) , Coffee, Water, Sugar).

1. Sketch a user interface which will be used for selecting different kinds of Coffee and sending the order to the server.
2. What components are used in your interface.

1. Draw class diagram for your coffee machine.
2. Implement Handling Orders Function in the server side.
3. Implement getting Resources from dataBase function.
4. Implement function uses the resources(Milk, Coffee, water) and take into consideration that multiple orders may use the same resources what are you going to do? What if we are making Coffee (water, Coffee), and Cappuccino (water, Coffee, milk) here milk is not used how can we take advantage of this by making these two orders in parallel without problems?
5. What if using Coffee resource time is greater than using milk resource time, what should we do?
6. VIII.Assuming each order has a priority (0: highest, 9: lowest). You need to re-implement the algorithm above in a way serve the highest priority available.
7. What is starvation? how would you prevent that from happening to your algorithm above. Keep in mind, you always execute orders according to priorities.
8. What timer would you use, how would you implement it.