Interview preparation questions

Theoretical

1. What is OOP?
2. Class vs Struct vs Instance?
3. If we can use Struct for everything, then why do we need a class?
4. Inheritance vs Abstraction vs Encapsulation vs Polymorphism. Examples.
5. Static vs Dynamic Polymorphism.
6. Stack vs Queue
7. Difference between a linked list and an Array.
8. What is a transaction in DB and why do we need them?
9. What is the difference between DROP and Truncate in DB.
10. Constructor and Deconstructor. Their order of calling.
11. Deep memory vs Shallow memory.
12. What is an interface?
13. Interface vs Virtual Class.
14. Reasons for making a virtual class?
15. What are indexing, advantages, and disadvantages?
16. What is Boyce Cord Normal Form?
17. Association vs Composition vs Aggregation.
18. What are overloading and overriding?
19. Why do we use aggregation?
20. Why do we use composition?
21. What even are Data Structures?
22. Why do we make new Data Structures?
23. Advantages of Stack/Queue.
24. Advantages of linked list.

25. Difference between Binary Tree and Binary Search Tree?
26. What are deadlocks in the database?
27. Difference between the ‘where’ clause and ‘having’ clause in a Query.
28. TCP vs UDP?
29. Http vs Https vs DNS.
30. What is a memory leak?
31. What are the types of polymorphism and inheritance?
32. What are stored procedures?
33. PUT vs PATCH?
34. Is it possible to overload a function in a derived class that has been inherited from the base class?
35. Explain the diamond problem in inheritance.
36. How do we reduce the capacity of a circular linked list?
37. What is the difference between a primary key and a unique key in a database?
38. What are views in DB.
39. What is the difference between unique and distinct in SQL.
40. Which one is better performance-wise. Subquery or join?
41. What is normalization in the database? Advantages and Disadvantages.
42. Having a pointer ptr. What does ptr = ptr + 1 do?
43. What are the advantages and disadvantages of multiple inheritances? How do we do it in java?
44. Can we do polymorphism without inheritance?
45. What are access modifiers?
46. How many default constructors can we define?
47. What is face data structure? (????)
48. What are ACID properties in DB?
49. What are anomalies in DB with examples?
50. What are joins? Explain.

Practical

a. Take an array with random numbers. Set all the positives on the right side and all the negatives on the left side of the array. How will you do it?
b. Swap two variables without using the third.
c. There are three bags. One has black balls, one has red balls and one contains a mix of both. Find out which has which. (???? Idk ????)
d. Write a query to get the department of an employee whose name is Ahmad from the given Table.
e. Add an age column in an existing database.
f. Delete a node whose data and address are given but no head address.
g. An array contains all the duplicate numbers and only one single number. Find the single number in O(n).
h. a range of numbers is given in an array with only one missing number. Find the missing number in O(n) complexity.
i. Write a function such that if we send parameter (8), it returns (7) and vice versa.
j. Rotate non-prime numbers in an array using only one loop (????).

k. There are three buckets with capacity 12l, 8l, and 5l. the bucket with 12l capacity is full while the other two are empty. We need to divide the water such that the initial
l. Make a function that takes an array and a number(x) as parameters. It shifts the array x times. But if the last element is zero then it keeps it there and shifts the 2nd last element. All the zeroes should remain in place.
m. You have the head node and tail node of two linked lists. Find out if they share a node with the same address or not.
n. How would you find a key in an infinite array?
o. An array contains positive and negative numbers. Write a code that places them in such a way that no two positive numbers are side by side and the same with negative numbers. For E.g. two positive numbers are separated by a negative number.
p. Write a code that checks whether a Binary Tree is Binary Search Tree or not.
q. Write a recursive code for finding a factorial of a number.
r. Write a recursive as well as iterative code that finds the size of a binary tree.
s. There are two ropes. Each rope takes 60 minutes to burn completely. Measure 45 minutes using these two ropes.
t. Write a code to reverse a singly linked list.
u. Write a code to see whether a loop exists in a single linked list.
v. Write a query to find students who are registered but took no class.
w. What are hexadecimal numbers? Convert them to binary, add both numbers, and return their sum. (????)
x. Delete the nth last node from a linked list using recursion.
y. Find pair of numbers whose sum sums up to 10.
z. Make a stack using a queue.
aa. Write a query to return the 3rd lowest salary from a record from DB.
bb. Convert in-order traversal result into pre-order.
cc. Given an array, find a sequence with the largest sum in O(n).
dd. Given the pointer to an element of an array, delete it. No head node is given.
ee. Given an array of infinite size, what approach would you use to find a number? It must be better than O(n).
ff. You have 8 pieces, 7 of these have equal weight and one is heavier. You are given a leveler scale. Find the heavier piece in just 2 steps.
gg. If C is inherited from A and B. what is the order of calling of destructors?
hh. Code to find anagrams.
ii. Write a query to find employees having the same salary.
jj. A blind man has 3 medicines, they have the same shape, size, and smell except for color. The blind man must eat two meds of different colors without anyone's aid. If he eats two of the same color, he'll die. Solve.
kk. Cut a cake into 8 slices using 3 cuts.

Concepts to revise.

1. Data Structures and Algorithms
2. Programming Fundamentals
3. Object Oriented Programming
4. Database and Architecture

5. Linked list.
6. Binary Search Tree.
7. Association, Encapsulation
8. Normalization (DB)
9. Operating Systems

Some Links.

OOP interview questions

DB interview questions

DSA interview questions

PF interview questions

Analytical Questions