

Preperation for Software Company Coding Test & Interview

\$\$ Complexity Finding of any Program/algo

NumberTheory:

- GCD/LCM (iterative)
- Divisor (SOD, NOD)
- Prime Check(iterative, sieve algo)
- Prime Divisor
- Fibonacci(iterative)
- Factorial(iterative)
- Recursion(GCD/LCM,Fibonacci,Factorial,BigMod)

Sorting/Searching:

- Bubble sort complexity: $O(n^2)$ [where n = the number of items]
- Merge sort complexity : $O(n\log n)$ [where n = the number of items]
- Binary search complexity : $O(\log n)$ [where n = the number of items]

Standard Template Library:

- Linq
- Structure(sorting)
- Pair(sorted,unsorted)
- String
- List,2D List(sorted,unsorted)
- HashSet(sorted,unsorted)
- Dictionary(sorted,unsorted)

N.B: Have to know about all the built-in functions provided with the ds.

Data Structure:

- Link List, Binary Tree
- Stack
- Queue
- Dequeue
- Priority Queue

N.B: Have to know about all the built-in functions provided with the ds.

Graph Algorithm:

- BFS/DFS(traverse,path)

Practice: LeetCode Problemset

Practice: Recursion Problems

Practice : LeetCode(array related problem)

Array Related Problems:

- merge two sorted array
- finds the frequency of elements of an array.
- array rotation.
- duplicate value find.
- find missing elements in a sorted array.
- max-min value finds, maximum subarray find.
- maximum subarray sum.
- insert value in a sorted array.
- find an element in an array using binary search.
- Root Finding of a number using Binary Search.
- Matrix multiplication.
- Find a number that is the power of two.
- int to string and string to int conversion.
- binary search on sorted rotated array
- common elements among 2/3 sorted array. Using only loop.
- Check a linked list circular or not
- Linked list middle elements
- Unsorted array missing element

OOP:

- <https://career.guru99.com/top-50-oops-interview-questions/>
- <https://www.c-sharpcorner.com>
- <https://www.c-sharpcorner.com>
- <https://docs.microsoft.com>

Database/SQL:

- <https://www.guru99.com/sql-interview-questions-answers.htm>

Practice: Sql Practice from HackerRank

Networking & Hardware:

- IP/MAC address: IP address stands for Internet protocol address(32-bit address). It's a logical address of the device assigned by the network to a device. MAC stands for Media Access Control address. It ensures the physical address of the device that is unique.
- Dynamic IP /Static IP: When a device is assigned a static IP address, the address does not change. Most devices use dynamic IP addresses, which are assigned by the network when they connect and change over time.
- Class Of IP address(A/B/C/D) : The 32 bit IP address is divided into five sub-classes.
 - Class A: First 8 bits require to represent Network ID, the rest of the 24 bits are for HOST ID.
 - Class B: First 16 bits require to represent Network ID, the rest of the 16 bits are for HOST ID.
 - Class C: First 24 bits require to represent Network ID, the rest of the 8 bits are for HOST ID.
 - Class D: IP address belonging to class D are reserved for multi-casting.
 - Class E: IP addresses belonging to class E are reserved for experimental and research purposes.
- Difference between HTTP and HTTPS: Simply put, HTTPS protocol is an extension of HTTP. That "S" in the abbreviation comes from the word "Secure".
- HTTP requests methods(GET,POST,PUT,DELETE): POST requests have to more secure than others.
- **TCP/IP, UDP:** Transmission Control Protocol, User Datagram Protocol.
 - TCP is a connection-oriented protocol and UDP is a connection-less protocol.
 - TCP establishes a connection between a sender and receiver before data can be sent.
 - UDP does not establish a connection before sending data.

Serial/Parallel port: Used for serial data transmission & Used for parallel data transmission.

Internet: The Internet is a global network of billions of computers and other electronic devices.

DNS: The domain name system (**DNS**) connects URLs with their IP address.

VPN: A virtual private network (VPN) gives you online privacy.

Ethernet: Wired Ethernet Network. The Ethernet technology mainly works with the fiber optic cables that connect devices within a distance of 10 km.

Wifi: Wireless connection. No cables are needed.

VIVA Experience (Dynamic Solution Innovators)

Problem Solving session

Q. Write a program to find the non-pair element from a given array. Like `arr[1,2,2,3,3]`, here 1 is hasn't no pair .so answer will be 1. Find the time and memory complexity of the program that you have written. Tell me how can you optimize the time and memory complexity of your answer. you have used Collections here, what will be the effect on complexity for using collections in your answer?

Q. Find nth Fibonacci number using recursive function.

Q. Sort some array element .where $0 \leq i \leq 10^5$ (i = indexr of elements) and $0 \leq arr[i] \leq 1000$. how can we sort it in $O(n)$?

Q. What is the Complexity of merge sort? can you explain it?

OOP session

Q. Explain briefly OOP principle?

Q. what is Abstraction?

Q. Difference between Abstraction And Encapsulation?

Q. What is method Overloading, Overriding, and Hiding?

Q. What is Interface? Why we use abstract class and Interface?

OOD And Design Principle session

Q. What is Onion Architecture in ASP.NET core MVC?

Q. What is the difference between Builder Pattern and Factory Pattern? Why we use this pattern?

Q. Tell me about the fourth Principle of SOLID? Write a program to explain this principle? what is the meaning of this principle?

Q. What is the difference between OOD and SOLID?

Q. What is REST API? Do you know the usages of REST API?

Database/SQL session

Q. What is No Sql? Have you used It?

Q. What is Normalization? Tell me 1st form of normalization?

Q. What is Indexing in database?

Q. What Web server is used in DotNet? like Java used apache.

Technical session

Q. What is HTTP protocol? Difference Between HTTP and HTTPS?

Q. What is HTTP request method? GET(), POST(), PUT(), DELETE() method.

Q. Tell me about Client to server request Procedure through a URL?

