Software Dev and Interview Prep Guide

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About Me

- I am Ashwani Yadav (1801EE13)
- I was introduced to coding by NJACK
- I used to jam in Music Room and play football.
- I then became the Coordinator of NJACK
- I did GSoC in my 2nd year with RocketChat
- I interned with Zomato, Success Numbers
- I got full time offer from Flipkart (Off-campus), Zomato (On-campus) Success Numbers

You can connect with me on:

- https://github.com/ashwaniYDV
- https://linkedin.com/in/ashwaniydv
- https://www.facebook.com/ashwani.iitp18/
- https://twitter.com/ashwani_iitp

Please read this slide carefully before following the learning contents

- For Internship focus on these topics:
  Projects
  OOP
  OS (not required but if you can do it will be plus point)

- For FTE:
  Projects
  OOP
  OS
  DBMS
  Computer Networks (Asked by some companies)
  System Desing or HLD (Asked by some companies)
  Low Level Desing (will strengthen your OOP concept)


DON'T PANIC

Projects (Page 1)

- Try to include at least one full stack project which leverages DBMS.

  You can use the concept of transactions if you are using RDBMS.
  Example: When you are booking a theatre seat in BookMyShow then that seat will be locked till you are deciding and no other people can book it simultaneously.

- You can also include Chat apps which uses websockets and learn about websocket protocol.

- You can also include ML/DL projects as well or projects done under your electives

Projects (Page 2)

- Be ready to answer these kinds of question for Full Stack projects:
  Why you choose a specific database over other?
  NoSQL vs SQL Databases?
  What are the challenges you faced and how you overcome them?

- Be ready to answer these kinds of question for ML/DL projects:
  What is Backpropagation?
  Explain your model’s algorithm?

Projects (Page 3)

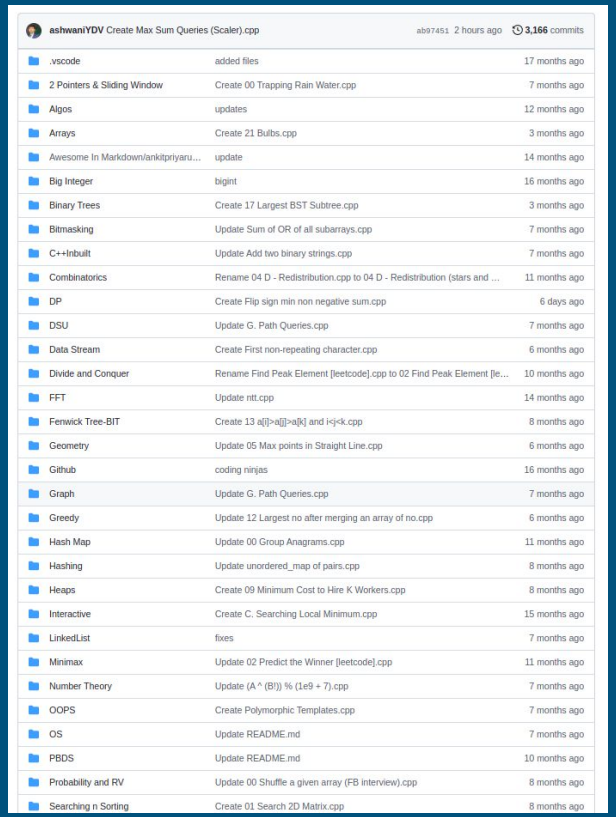
- For full stack project:

  For backend you can learn about any one:
  NodeJS (javascript), Django (python), Spring-boot (java)

  For frontend you can just focus on the most widely used library / framework:
  ReactJS (javascript / typescript), Angular (typescript)

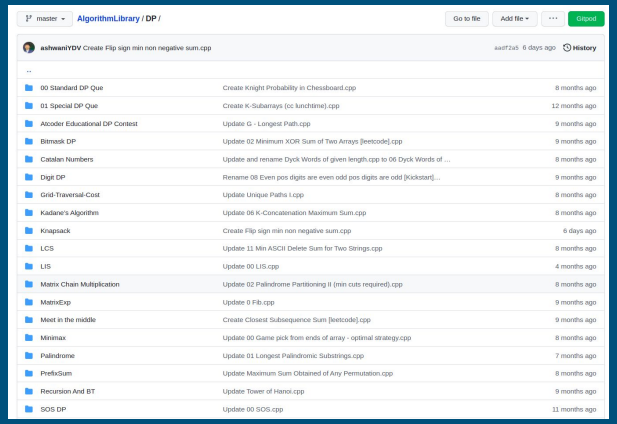
  You can use any database:
  MySQL, PostreSQL, MongoDB, etc

Make your own Algorithm Library on Github



ashwaniYDV Create Max Sum Queries (Scaler).cpp — ab97451 2 hours ago — 3,166 commits

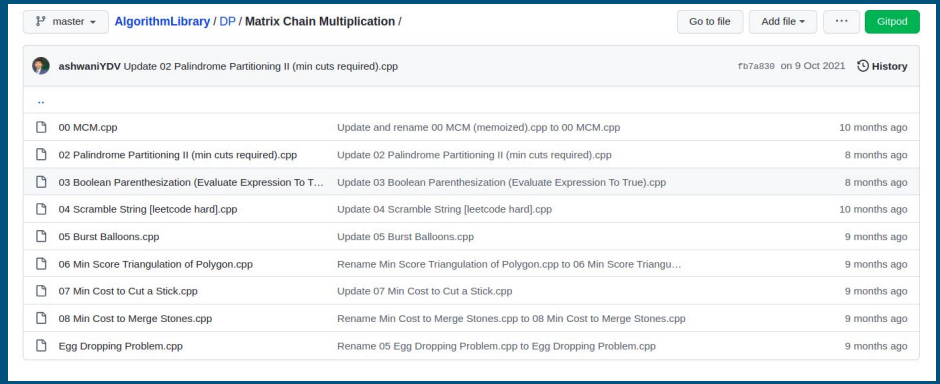
.vscode	added files	17 months ago
2 Pointers & Sliding Window	Create 00 Trapping Rain Water.cpp	7 months ago
Algos	updates	12 months ago
Arrays	Create 21 Bulbs.cpp	3 months ago
Awesome In Markdown/ankitpriyaru…	update	14 months ago
Big Integer	bigint	16 months ago
Binary Trees	Create 17 Largest BST Subtree.cpp	3 months ago
Bitmasking	Update Sum of OR of all subarrays.cpp	7 months ago
C++Inbuilt	Update Add two binary strings.cpp	7 months ago
Combinatorics	Rename 04 D - Redistribution.cpp to 04 D - Redistribution (stars and …	11 months ago
DP	Create Flip sign min non negative sum.cpp	6 days ago
DSU	Update G. Path Queries.cpp	7 months ago
Data Stream	Create First non-repeating character.cpp	6 months ago
Divide and Conquer	Rename Find Peak Element [leetcode].cpp to 02 Find Peak Element [le…	10 months ago
FFT	Update ntt.cpp	14 months ago
Fenwick Tree-BIT	Create 13 a[i]>a[j]>a[k] and i<j<k.cpp	8 months ago
Geometry	Update 05 Max points in Straight Line.cpp	6 months ago
Github	coding ninjas	16 months ago
Graph	Update G. Path Queries.cpp	7 months ago
Greedy	Update 12 Largest no after merging an array of no.cpp	6 months ago
Hash Map	Update 00 Group Anagrams.cpp	11 months ago
Hashing	Update unordered_map of pairs.cpp	8 months ago
Heaps	Create 09 Minimum Cost to Hire K Workers.cpp	8 months ago
Interactive	Create C. Searching Local Minimum.cpp	15 months ago
LinkedList	fixes	7 months ago
Minimax	Update 02 Predict the Winner [leetcode].cpp	11 months ago
Number Theory	Update (A ^ (B!)) % (1e9 + 7).cpp	7 months ago
OOPS	Create Polymorphic Templates.cpp	7 months ago
OS	Update README.md	7 months ago
PBDS	Update README.md	10 months ago
Probability and RV	Update 00 Shuffle a given array (FB interview).cpp	8 months ago
Searching n Sorting	Create 01 Search 2D Matrix.cpp	8 months ago



master — AlgorithmLibrary / DP / — Go to file — Add file — Gitpod

ashwaniYDV Create Flip sign min non negative sum.cpp — aadf2a5 6 days ago — History

00 Standard DP Que	Create Knight Probability in Chessboard.cpp	8 months ago
01 Special DP Que	Create K-Subarrays (cc lunchtime).cpp	12 months ago
Atcoder Educational DP Contest	Update G - Longest Path.cpp	9 months ago
Bitmask DP	Update 02 Minimum XOR Sum of Two Arrays [leetcode].cpp	9 months ago
Catalan Numbers	Update and rename Dyck Words of given length.cpp to 06 Dyck Words of …	8 months ago
Digit DP	Rename 08 Even pos digits are even odd pos digits are odd [Kickstart]…	9 months ago
Grid-Traversal-Cost	Update Unique Paths I.cpp	8 months ago
Kadane's Algorithm	Update 06 K-Concatenation Maximum Sum.cpp	8 months ago
Knapsack	Create Flip sign min non negative sum.cpp	6 days ago
LCS	Update 11 Min ASCII Delete Sum for Two Strings.cpp	8 months ago
LIS	Update 00 LIS.cpp	4 months ago
Matrix Chain Multiplication	Update 02 Palindrome Partitioning II (min cuts required).cpp	8 months ago
MatrixExp	Update 0 Fib.cpp	9 months ago
Meet in the middle	Create Closest Subsequence Sum [leetcode].cpp	9 months ago
Minimax	Update 00 Game pick from ends of array - optimal strategy.cpp	8 months ago
Palindrome	Update 01 Longest Palindromic Substrings.cpp	7 months ago
PrefixSum	Update Maximum Sum Obtained of Any Permutation.cpp	8 months ago
Recursion And BT	Update Tower of Hanoi.cpp	9 months ago
SOS DP	Update 00 SOS.cpp	11 months ago



master — AlgorithmLibrary / DP / Matrix Chain Multiplication / — Go to file — Add file — Gitpod

ashwaniYDV Update 02 Palindrome Partitioning II (min cuts required).cpp — fb7a830 on 9 Oct 2021 — History

00 MCM.cpp	Update and rename 00 MCM (memoized).cpp to 00 MCM.cpp	10 months ago
02 Palindrome Partitioning II (min cuts required).cpp	Update 02 Palindrome Partitioning II (min cuts required).cpp	8 months ago
03 Boolean Parenthesization (Evaluate Expression To T…	Update 03 Boolean Parenthesization (Evaluate Expression To True).cpp	8 months ago
04 Scramble String [leetcode hard].cpp	Update 04 Scramble String [leetcode hard].cpp	10 months ago
05 Burst Balloons.cpp	Update 05 Burst Balloons.cpp	9 months ago
06 Min Score Triangulation of Polygon.cpp	Rename Min Score Triangulation of Polygon.cpp to 06 Min Score Triangu…	9 months ago
07 Min Cost to Cut a Stick.cpp	Update 07 Min Cost to Cut a Stick.cpp	9 months ago
08 Min Cost to Merge Stones.cpp	Rename Min Cost to Merge Stones.cpp to 08 Min Cost to Merge Stones.cpp	9 months ago
Egg Dropping Problem.cpp	Rename 05 Egg Dropping Problem.cpp to Egg Dropping Problem.cpp	9 months ago

OOP

- LearningLad Playlist:
  https://www.youtube.com/playlist?list=PLfVsf4Bjg79DLA5K3GLbIwf3baNVFO2Lq
- Rajeshwar Bhaiya OOP notes
  https://drive.google.com/file/d/1ms6hVN12Nx9JjlCi8OwgtZLnjVxH4c5r/view
- Implement your own vector class:
  https://youtu.be/HN3tZaMcgkw
- SMART POINTERS in C++ (std::unique_ptr, std::shared_ptr, std::weak_ptr)
  https://youtu.be/UOB7-B2MfwA
  https://www.geeksforgeeks.org/smart-pointers-cpp/
- Dependency Injection
  https://www.youtube.com/watch?v=oqYRl06DNHQ
- V pointer and V table
  https://youtu.be/cUCy2ENJjW8
  https://youtu.be/Z_FiER8aAqM

C / C++ Fundamentals

- Pointers in C++: https://www.youtube.com/watch?v=h-HBipu_1P0&list=PL2_aWCzGMAwLZp6LMUKI3cc7pgGsasm2_
- My Code School Channel: https://www.youtube.com/user/mycodeschool

Operating System (Page 1)

- Gate Smashers Playlist: https://www.youtube.com/watch?v=bkSWJJZNgf8&list=PLxCzCOWd7aiGz9donHRrE9I3Mwn6XdP8p
- CodeVault Channel: https://www.youtube.com/c/CodeVault/playlists
- Unix Threads in C: https://www.youtube.com/watch?v=d9s_d28yJq0&list=PLfqABt5AS4FmuQf70psXrsMLEDQXNkLq2
- Unix Processes in C: https://www.youtube.com/watch?v=cex9XrZCU14&list=PLfqABt5AS4FkW5mOn2Tn9ZZLLDwA3kZUY

Operating System (Page 2)

- GFG: https://www.geeksforgeeks.org/operating-systems/
- GFG Quick Revision: https://www.geeksforgeeks.org/commonly-asked-operating-systems-interview-questions/ https://www.geeksforgeeks.org/last-minute-notes-operating-systems/
- 40+ Operating System Interview Questions (2021) - Interviewbit: https://www.youtube.com/watch?v=cex9XrZCU14&list=PLfqABt5AS4FkW5mOn2Tn9ZZLLDwA3kZUY
- Sorting larger file with smaller RAM https://www.geeksforgeeks.org/sorting-larger-file-with-smaller-ram/

DBMS (Page 1)

- Gate Smashers: https://www.youtube.com/playlist?list=PLxCzCOWd7aiFAN6I8CuViBuCdJgiOkT2Y
- GFG Quick Revision: https://www.geeksforgeeks.org/commonly-asked-dbms-interview-questions/ https://www.geeksforgeeks.org/commonly-asked-dbms-interview-questions-set-2/ https://www.geeksforgeeks.org/last-minute-notes-dbms/
- Interactive website to practise and learn on the go: https://sqlbolt.com/
- B Trees and B+ Trees: https://youtu.be/aZjYr87r1b8
- GFG last minute notes: https://www.geeksforgeeks.org/last-minute-notes-dbms/

DBMS (Page 2)

- DATABASES SDE SHEET (RIDDHI DUTTA): https://docs.google.com/document/d/1KZ5mxEwyWjnHyh7ZG8IJtalDpqf-zvRIUC0BS5mpZ-o/edit?usp=sharing
- ACID Properties: https://www.geeksforgeeks.org/acid-properties-in-dbms/
- CAP theorem: https://www.geeksforgeeks.org/the-cap-theorem-in-dbms/

Computer Networks

- OSI Model:
  https://youtu.be/vv4y_uOneC0
  https://www.geeksforgeeks.org/layers-of-osi-model/
- Last minutes notes - GFG:
  https://www.geeksforgeeks.org/last-minute-notes-computer-network/
- https://www.geeksforgeeks.org/what-happens-when-we-type-a-url/
  https://medium.com/@maneesha.wijesinghe1/what-happens-when-you-type-an-url-in-the-browser-and-press-enter-bb0aa2449c1a
- Ipv4 vs ipv6:
  https://www.geeksforgeeks.org/differences-between-ipv4-and-ipv6/
  https://www.geeksforgeeks.org/introduction-and-ipv4-datagram-header/

High Level Design (HLD or System Design)

- Most famous resource (Github repo): https://github.com/donnemartin/system-design-primer
- Gaurav Sen Playlist: https://www.youtube.com/watch?v=xpDnVSmNFX0&list=PLMCXHnjXnTnvo6alSjVkgxV-VH6EPyvoX
- Tech Dummies Narendra L (ye bhagwan aadmi hai) https://www.youtube.com/c/TechDummiesNarendraL
- Consistent Hashing: https://youtu.be/-4XwdbV6Ncg
- Netflix System Design: https://youtu.be/psQzyFfsUGU

Low Level Design (LLD)

- Design an in-memory database: https://vicharon-ki-duniya.vercel.app/blog/in-memory-database-java

Open Source Programs

General Tips:

- Your friends are your best mentors.
- In my friend circle we used to give and take interviews of each other
- We had a whatsapp group where we used to send problem links, useful blogs, system design concepts, etc.
- You can make the interview go in flow with the direction you really are expert at.
- My seniors used to say that one day you will definitely reach there where you truly deserve.

Pain is inevitable, suffering is optional.

Thank You!