
UIUC

Technical Interview

— **Christian Yongwhan Lim** —
2pm CT, May 1, 2024

Christian Yongwhan Lim



Education



Part-time Jobs



Full-time Job



Workshops



Coach/Judge



<https://www.yongwhan.io>

Christian Yongwhan Lim



- Christian and Grace Consulting **Owner**;
- Columbia **Adjunct** (Associate in CS);
- Columbia ICPC **Head Coach**;
- ICPC **Internship Manager**;
- ICPC World Finals CLI Symposium **Co-lead**;
- ICPC Curriculum Committee **Co-lead**;
- ICPC North America **Leadership** Team;
- ICPC North America Championship **Operations**;
- ICPC North America Programming Camp **Trainer**;
- ICPC NAQ and Regionals **Judge**;



<https://www.yongwhan.io>

Overview

- **Part I: Data Structures Interview**
- **Part II: Competitive Programming**
- **Part III: Behavioral Interview**

Part I: Data Structures Interview

Interview Types

- **Technical Interview**
 - Tests technical skill-sets required for a job.
- **Behavioral Interview**
 - Tests soft skills (e.g., effective communication, conflict resolution, etc)

Technical Interview

- Recruiter Call
- **0-1 Online Coding Challenge**
 - automated screening with 2-3 questions.
- **2-3 Technical Phone Screens**
 - first technical conversation with human.
- **4-7 Interviews in Onsite**
 - similar to phone screening but more in-depth; you may get probed on your claimed expertise.
- 0-5 Fit Calls & Negotiation

Interview Topics

- **Data Structures and Algorithms**
- System Design

Interview Topics

- **Fundamentals**
 - Arrays and Linked Lists
 - Binary Trees
 - Heaps
 - Sorting

Interview Topics

- **Important**
 - Stacks and Queues
 - Hash Tables
 - Binary Search Trees
 - Searching
 - Recursion

Interview Topics

- **Real Differentiators (Tech vs Quant)**

- **Strings:** Knuth Morris Pratt (KMP); Rabin Karp / String Hashing; Suffix Array; Suffix Automaton;
- **Dynamic Programming:** 1D; 2D; Interval; Tree;
- **Greedy Algorithms** and Invariants: Matroid;
- **Graphs:** Shortest Path; Lowest Common Ancestor; Flow / Matching; Minimum Spanning Tree;

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 - BFS; DFS; Dijkstra; Bellman-Ford; Floyd-Warshall;
 - Ford-Fulkerson/Edmond-Karp; Dinic;
 - Prim; Kruskal (DSU);

Sample Problem

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Any Idea?

Sample Solution

```
int minInsertions(string &s) {  
    int n = s.size();  
    vector<vector<int>> dp(n, vector<int>(n,0));  
    for (int i = 1; i < n; i++)  
        for (int j = 0, k = i; k < n; j++, k++)  
            dp[j][k] = (s[j]==s[k]) ?  
                        dp[j+1][k-1] :  
                        min(dp[j][k-1], dp[j+1][k])+1;  
    return dp[0][n-1];  
}
```


Interview Preparation Resources (Tech)

- **LeetCode:** Solve all four weekly/biweekly problems in **60 minutes!**
 - $3 + 6 + 12 + 24$ (+15 buffer)
- **CodeForces:** Get to **1800+** rating
 - Clear 4 questions out of 6!

Interview Preparation Resources (Quant)

- **LeetCode:** Solve all four weekly/biweekly problems in **20 minutes!**
 - $1 + 2 + 4 + 8$ (+5 buffer)
- **CodeForces:** Get to **2200+** rating
 - Clear 5 questions out of 6 **fast!**

Interview Preparation Resources

- **Tech:** *Elements of Programming Interview*
- **Quant:** *Competitive Programming 4*

Part II: Competitive Programming

Programming Zealots @Discord

- Break into **CodeForces** rating of **2200+** as fast as you can!
- Join the discord server!

bit.ly/programming-zealot



Programming Zealots @CodeForces

- Also, join CodeForces group!

bit.ly/cf-zealots



Success Pathways

- [Programming Zealots](#) @ CodeForces
- 800 - 2100 (A - N)
 - **For those who are just starting**
 - To gain some experiences with an explicit goal to enjoy the process of solving new problems;
 - To make it to the ICPC North America Championship (NAC)!

Success Pathways

- [Programming Zealots](#) @ CodeForces
- 800 - 2100 (A - N)
 - **For those who are just starting**
 - To gain some experiences with an explicit goal to enjoy the process of solving new problems;
 - To make it to the ICPC North America Championship (NAC)!
- 2200 - 3500 (O - ZB)
 - **For those who are more serious**
 - To make it to the ICPC World Finals (and potentially winning a medal)!

Practice Strategy

- If your goal is to get to a rating of **X**, you should practice on problems that are **X + 300** typically, with a spread of 100. So, picking problems within the range of:

$\{X + 200, X + 300, X + 400\}$

would be sensible!

Practice Strategy

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- So, if you want to target becoming a **red (grandmaster)**, which has a lower-bound of 2400, you should aim to solving {2600, 2700, 2800}.
- **(Eventual) Target:** You should focus on solving it for 30 minutes or less!

Practice Strategy (con't)

- You should focus on solving each problem for **30 minutes or less**; if you cannot, you should consider solving a problem with a lower rating.
- You should aim to solve **~5 problems** each day within this range to expect a rank up within six months.

Practice Strategy (con't)

- You should focus on solving each problem for **30 minutes or less**; if you cannot, you should consider solving a problem with a lower rating.
- You should aim to solve **~5 problems** each day within this range to expect a rank up within six months.
- If you cannot solve a problem, here is a sample recipe you can follow:
 - Look at editorial for **hints**, and try to solve the problem.
 - Look at editorial for **full solutions**, and try to solve the problem.
 - Look at **accepted code**, and try to solve the problem.
 - Make sure you **revisit after two weeks** and see if you can solve it.

Popular Training Resources

- **U ICPC:** <https://u.icpc.global/training/>
- **CP Algorithms:** <https://cp-algorithms.com/>
- **USACO Guide:** <https://usaco.guide/>
- **Kattis:** <https://open.kattis.com/>
- **CSES:** <https://cses.fi/problemset/>
- **solved.ac:** <https://solved.ac/>

International Collegiate Programming Contest (ICPC)

- If you would like to get involved in helping out as a volunteer or an official (unpaid) intern, please reach out via christian.lim@icpc.global or internship@icpc.foundation.

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- If you would like to get involved in helping out as a volunteer or an official (unpaid) intern, please reach out via christian.lim@icpc.global or internship@icpc.foundation.
- **Especially great** for getting:
 - Immigration help (e.g., F-1 Post-Completion OPT)
 - Practical experiences
 - Interview and/or programming contest training
- Some Stanford students were previous interns (now at quant)! 😊

Part III: Behavioral

Behavioral Interview

- Becoming an industry standard to have at least one session in typical software engineering interview loop.
- Wants to assess leadership potential.
- Tests soft skills (e.g., effective communication, conflict resolution, etc.)
- Open-ended: **not** about getting it right or wrong!

Sample Question

- Tell me about a time when you led a team to successfully complete a project.

Sample Answer

- Best if you led a hackathon/passion project.
 - Otherwise, if you led a project as an intern, highlight it.
-
- Be **concise**!
 - Include hard **metrics** in terms of %, \$, etc.
 - Provide **concrete** examples.

Resources

- *Behavioral Interview Questions and Answers* by Horatio Bird;
- *Leadership Interview Questions You'll Likely Be Asked* by Vibrant Publishers;

Terse Guides

- Please take a look as needed:

bit.ly/christian-terse-guide



Any Questions?

- Find this slide deck from:

bit.ly/uiuc-tech-workshop

Contact Information

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 - Feel free to send me a connection request!
 - Always happy to make connections with promising students!