

DOLAT Capital Interview Experience - Jay Jain

Tech round (2 hours)

I was interviewed by 2 Senior Employees of DOLAT Capital at their office.

1. The Interview will be completely on Cpp and OOPs
2. Avoid using Standard template libraries (STL) in codes
3. How long have I been doing Cpp and how would I rate myself on Cpp and OOPs
(I told him I wasn't quite experienced in Cpp but had been practising it for placements since a month only but I have been studying DSA in my coursework)

The interview began with a few starter Cpp and OOPs questions

1. Pillars of OOPs. Explain all (Encapsulation, Abstraction, Polymorphism, Inheritance)
2. How to implement abstraction in Cpp (Access specifiers) (**Code it on paper**)
3. Combined questions on Inheritance, object creation and Abstraction
 - a. Difference between **public**, **private** and **protected**
 - i. While inheriting
 - ii. While creating objects
 - iii. While passing or accessing (Getters & Setters)
4. Types of Inheritance (Explain each and **Code on paper** a few problems in each)
Like having same named inherited data variable in case of multiple inheritance
How can you solve it -> Using ":" operator. Then follow up questions like
 1. How to inherit public data members as private in child class
 2. Use of scope resolution operator "::"
5. Difference between Compile Time and Run Time Polymorphism
6. Function Overloading and Function Overriding. I was given multiple functions with same name but different arguments and asked which function will be invoked when defined with specific formal and default parameters (**Code on paper**)
7. Basic questions on many more operators like ">", "<", "<=", ">=", "&", "&&"
8. Constructors and Destructors
 - a. Default, parameterised and public or private constructors
 - b. Use of **delete** keyword
 - c. Use of **this** keyword

DSA Questions (I was asked to **code on paper** all the following questions as pseudocode functions in Cpp, not complete just the logic is enough)

1. Given a string, example - "J12A34Y56" print only integers from string in reverse order (Best approach was using **ASCII** codes since STL was not allowed, store in **vector** since we do not know how many integers could be in string and print the vector in reverse order)
2. Build a class of **singly** LinkedList without using STL that has InsertAtHead, InsertAtTail, DeleteAtPos, Pop, printLL functions
3. Given a singly LinkedList 1, 2, 3, 4, 5, 6, 7 -> print 1 3 5 7 7 5 3 1
I used a count variable to check for odd positions in LinkedList while forward traversal and store their data values in vector. I had to store before printing because the output also requires a reverse order printed as well since back traversal in singly Linked List is not possible

4. Given a sorted array 1, 5, 7, 10, 11 -> return the indices of two numbers that add up to a given target. Example if target = 8 return 0, 2
First approach is using a $O(n^2)$ loop but I straight off mentioned it and avoided it. The interviewer mentioned I could use Hash Maps but I wasn't aware about Hashes. Since it was a sorted list I could firstly have a check to exclude all elements greater than target to reduce n in $O(n^2)$. Loop traversing from 1st element to last, I could subtract that element from target and search for the remaining value using Binary search reducing the complexity from $O(n^2)$ to $O(n \log n)$.
5. Implement a Stack using Queues. I used 2 queues one for push and other for Pop

Then quite alot of Cpp theory

1. Types of Pointers
2. Garbage Collection and Memory Leak in Cpp (Smart Pointers)
3. Difference between Static and Dynamic Allocation of objects
4. Keywords - new, malloc, static, void, this

I was able to answer most questions except a question on malloc and Hash Maps

HR Round (15 mins)

1. Introduce yourself
2. Family members
3. Why DOLAT?
4. Why not current internship company's PPO?
5. Masters Plan?
6. Tech Stack I'm proficient and interested in?

Then I was given some knowledge about DOLAT, its vision, its services, teams etc.