

Technical question

- How to emulate FIFO queue using LIFO stack, e.g implement enqueue() and dequeue() using push() and pop()?
- What network protocol to use for distributing stock market data message from single server to multiple desktops (TCP or UDP, broadcast / multicast / unicast)? How to minimize the bandwidths?
- What is difference between java interfaces and abstract classes?
- What is the difference of pointer and reference in C++? how does smart pointer work? What is the advantage?
- How to prevent deadlock? How to implement consumer producer queue? (thread synchronization)
- How to destroy the singleton object instance?
- What is the advantages of hash / map / vector in storing (key, value) pairs?
- What is java object ID? And its usage in data structure likes heap and compare function?
- What is the problem of multiple inheritance in C++? Virtual inheritance? Any benefit of multiple inheritance?
- When to choose inheritance and composition? Give example.
- What kind of development process do you use? (iterative approach)
- How to do testing (unit test and integration test) in your projects?
- How to find a file in the remote computer (linux question)?
- Toss two coins, If one tell there is at least one head, what is the probability of getting two heads?
- How to detect memory leak? How to avoid?
- In the case of call option, what is the premium? (intrinsic value + time value)
- What is the interest rate if you lend money to someone (i) buy a car, (ii) buy a house and (iii) start a business.
- What design pattern have you used?
- Sequence of calling destructors in inheritance hierarchy C++.
- Describe how to use C++ without pointer and just use reference ? (using smart pointer)
- What do you do when the customer (trader) find your program crashes?
- What did you do in your last research project?
- What is time complexity of hash and binary tree in searching?
- When to use set and multiset?
- How to avoid deadlock in a shared FIFO queue?
- Give example that you have done using multithreading.
- What network protocol do you use in transmitting real time data, e.g. stock information?
- Give example you use semaphore? How to emulate mutex by semaphore? How to emulate semaphore by mutex?
- How to check a SIGNED integer that is divisible by two?
- How to reverse a single linked list?
- How to create a thread (pthread, wait, join)?
- Why vector is more useful than hashtable in storing the (tickname, company name) pair? And constraints.
- When to use conditional variable? Conditional variable Vs Mutex Vs Semaphore
- Write a simple C++ program to use C++ vector to lookup price index.
- How to detect memory allocation error using new? Why don't need to check in desktop PC?
- When to use dynamic_cast?

Explanation to Sungard MC questions :

```
(3) namespace cdoi
{
    double x =123;
    void f() { std::cout << x; } // This is fine.
}

namespace cdoi
{
    void f() { std::cout << x; } // Compile error.
    double x =123;
}
```

- (5) Destructor of derived class is not invoked without `virtual` declaration.
- (10) This is GCD, not LCM.
- (14) Please see virtual inheritance in C++03 document.