Apple Software Engineer Interview Questions

May 30, 2016

- Implement a peek using a existing iterator next and has-next function.
- What is the difference between weak and strong pointers
- Reverse a linked list recursively
- Why can't you use primitives in a hash-map.
- Traverse a binary tree recursively.
- Write a basic Fibonacci sequence implementation.
- How does delegation work?
- How does ARC work in Objective C, and how is it different from garbage collection?
- How would you design a data structure that is an array, but with so many elements such that the array almost fills up the entire RAM?
- How would you reverse a singly-linked list?
- What is the run time of a binary search tree.
- Find the most frequent element in an integer array.
- Is Java pass by value or pass by reference?
- What data structure would you use to auto complete a dialer when the phone may have thousands or hundreds of thousands of entries.
- Find the K th largest number in an array.
- What is deadlock and how is it prevented? Intersection of two arrays with optimal Big O.
- What is the instruction used in Matlab to compute the standard deviation?
- Write a simple C++ algorithm involving standard input and output. Provide test cases.

- How do you design a system for detecting people around a door, predict whether this man will go into the door.
- Skyline problem.
- Given a set of interval tuples, find the longest overlapping interval.
- Given a huge log file of a web server, find the IP addresses that had exactly 1 request.
- A network is connected in a line, so that servers can talk only to the servers to their left or right. Servers know if they are the leftmost or rightmost servers. What's a protocol for every server to learn the full topology? How long does it take?
- Implement a queue using array or linked-list.
- What is polymorphism?
- How could you approximate a non-linear function with only multiplication and additions.
- What are the techniques for allocating static and dynamic memory.
- Find the first non-repeated element in C.
- Given a binary search tree, print the nodes at each level on a separate line. With O (n) time complexity and O(1) space complexity.
- Describe the process of an interaction on a web page button from the click to the response.
- What is NTP and explain how TCP works?
- Given an iTunes type of an application that pulls down lots of images that get stale over time, what strategy would you use to flush disused images over time?
- Is there a difference between performSelector and a performSelector with delay of 0?
- Write a function to reverse a string.
- If you have 2 eggs, and you want to figure out what's the highest floor from which you can drop the egg without breaking it, how would you do it? What's the optimal solution?
- What is polymorphism?
- What does final keyword do in Java?
- How would you go through a list of country music words?

- Write code to find out the frequency of common words.
- Given a deck of cards, write a method to determine if it is "flush".
- Given busy slots as a data-set in a person's calendar (ex: (1000,1200),(1415,1530),..) and the time required for a meeting (ex: 45 minutes). Write a method to find an open available slot for scheduling a meeting.
- Assume you have many pages of slides, you want to change the order when you are editing them, say, you would like to insert the 7th page after the 3rd page and before the 4th page. Design and implement your idea.
- Find the smallest number in an array
- Find duplicate words in a file implementing uniq.
- What are the run levels of init.
- There is a mission critical (i.e., cannot to be rebooted) server that is lagging hard. You only have a terminal/shell prompt. How do you debug it?
- Reverse a string in Python without using str.reverse()
- Write code in Objective-C to return the first repeated integer from a given array, with O(n) time.
- How would you speed up your typical bit reversal algorithm?
- How large file can be on HDFS distributed file system?
- Given an integer, write code to list all primes preceding it.
- Explain singleton class in Java
- Given an array with N-2 elements (two missing) from 1 to N, find the two missing elements in linear time and constant memory usage.
- How would you design evernote app.
- Find circular loop in linked list.
- Ants are at the corners of an equilateral triangle labeled 1, 2, and 3, each ant starts moving towards the next one (1 towards 2, 2 towards 3, 3 towards 1) at the same constant speed. How long until they meet?
- How to speed up a database query?
- Implement strstr using a linked list of linked lists.
- Create a synchronization primitive for the operating system/kernel from scratch.

- Create a primitive that doesn't waste CPU cycles. (essentially, how would you create a mutex inside the kernel?)
- Collapse a binary search tree into a sorted list.
- What is the difference between Grand Central Dispatch, NSThread, and NSOperation and when would you use each?
- Implement an iterator for a binary search tree that will iterate the nodes by value in ascending order.
- Explain semaphores.
- Difference between thread and a process.
- What is the difference between 64 vs 32 bit addressing.
- Model an elevator.
- Why do you write "assign" in a property declaration on an Objective-C class.
- Reverse a C string that has a special character encoding.Special characters are two bytes and are preceded by a flag character represented by the highest bit being set to 1, then the following bits specifying how many special characters will follow. The special characters are be interspersed between normal characters.
- Describe MVC
- Describe Categories
- Design an automatic reference counter for Objective-C
- Find the n fibonacci numbers
- Write a function that traverses a binary tree
- Write an array map function in Ruby and in JavaScript
- Given the following struct how much memory is require to store it in a 32-bit and 64-bit system?struct A char t;char *t;
- How do you change permissions of a file from the terminal?