Algorithm list

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Behavioral Questions:

1. What do you day dream about?
   - For this question I would be gauging how genuine the person was, this would be useful for the rest of the interview.

2. Talk about a success story in your Computer Science Career/studies.

3. What did you take away from that success?
   -I would be looking for how excited they are by the subject, a good candidate would clearly be excited by what they've learned and been able to do. I would want people working for me that love the career path they've chosen.

4. Talk about a failure in your Computer Science Career/studies.

5. What did you take away from that failure?
   -For these questions I would be curious to see how many details of the failure that they remembered and how they talk about it. A good candidate would show that the experience changed them and they wouldn't make the same mistake again. A bad candidate would be brief and vague. "One time I turned in an assignment that didn't compile and I got a bad grade."

6. Things move fast in the tech industry, how will you keep up?
   -I would want the candidate to demonstrate that computer science is a journey and they've only taken the first step. I would want them to express that they intend on improving their craft. I would want them to mention recent advances in tech and new items and show that they've already researched and worked with these things.

7. Talk about a group project you participated in and what you contributed to that project.
   -It's important to work well with others. Real software isn't written the night before the due date by one person. It's a collaboration.

8. What is your least favorite aspect of Computer Science?
   -I would want to know what their least favorite thing to do was and perhaps how they've dealt with it. A good response would be "My least favorite aspect of Computer Science is rigorously testing code. I know that it is important for building good software so it's any area that I've worked on improving and will continue working on"

Technical Questions:

1. Give an overview of red/black trees and explain what they are good for.
   -I wouldn't expect a candidate to be able to explain red-black tree algorithms in detail but I would expect them to know what they were useful for. Bonus points if they were able to write insert and delete in red-black trees from memory.

2. Explain quicksort to me as if I'm a non-technical person.
   - I would be looking for how well they communicate ideas. Most CS majors have quicksort down but how well can they explain it? This would demonstrate good ability to communicate ideas to teammates and explain items to clients.

3. What is the theoretical limit of comparison based sorting algorithms?

   -This is just a piece of trivia, I think it is something that programmers should know.

4. What is your favorite data structure and why? n
   -This could probably fall into the behavioral category but I would be looking for signs of in depth knowledge of the structure. "I like hash tables" wouldn't cut it. "I like hash tables, it's fascinating how you can implement them with separate chaining or linear probing. It's also great how much research is done on hash functions."

5. Explain how to implement a graph using an adjacency matrix.
   -This question is similar to number 2 but more technical. I would be looking for how well they understand an adjacency matrix and how well they are able to convey that information.

6. Write a function that reorders a link list by smallest, largest, second smallest, second largest etc.
   -I think this question is relatively unique, I would want to see their process. I wouldn't care how fast they went but rather how they approached the problem. I would probably ask that they think aloud so I could follow that process closely

7. Describe a useful data structure augmentation.
   -For this question I would be looking to see that they understand that data structures are very malleable. I would want to see that they can think outside of the box.

Location

This test would take place in a comfortable room with a white board. I would want them to be able to be able to draw as much or as little as they wanted to as they thought through the problems.

Evaluation

I would evaluate the candidates based on a combination of behavioral answers and technical answers. The ideal candidate would perform exceptionally well on the behavioral questions and reasonably well on the technical questions. I'd be willing to overlook mistakes in the technical questions if the candidate demonstrated willingness to work hard, showed enthusiasm for the potential position, exhibited genuineness, and understood that becoming great at the position was a process. I wouldn't be inclined to hire someone that aced the technical questions but performed poorly on the behavioral questions.