

Applicant's Name, Last name:

Wei Yang

1. What is the difference between a *list* and a *set*?

List allows repetitive values and has sequence as same as the sequence when it is created.

A set is usually unordered and has only unique values.

2. What ways of achieving concurrency do you know? What are the limitations of those ways?

I know about thread and process.

Thread is light-weighted concurrency. Process concurrency contains many threads. The limitation are: it is strongly restricted by hardware, even the concurrency is implemented and works properly, but the fact is if there is only one CUP in the system that it is still not true concurrency. The CPU just does one thing after another. Otherwise if source starvation is occurring the performance of concurrency will drastically drop down.

3. What is the worst case time complexity of a quick sort?

It happens when every time the biggest or the smallest value is chosen as pivot then the time complexity is $O(n^2)$.

4. What is an *eigenvalue* and an *eigenvector*?

An eigenvector is a nonzero vector that after transformation it is still on the same line with the original one, but it can have different direction or length. Eigenvalue is the value which the eigenvector has by some transforming.

5. For a given linked list containing the first 100 numbers (0, 1, 1, 2, 3, 5, 8..., 218922995834555200000), please provide a solution that returns a linked list in the following order: 218922995834555200000, ..., 8, 5, 3, 2, 1, 1, 0.

Please check the attachment, thank you!

6. Are you available to work full-time at our office in Berlin or are looking to work freelance?

I am looking for a full time job with contract.

7. Why do you want to change your current job?

Because the company is insolvent.