Interview Questions: Hash Tables

Help Center

Warning: The hard deadline has passed. You can attempt it, but **you will not get credit for it**. You are welcome to try it as a learning exercise.

These interview questions are for your own enrichment and are not assessed. If you click the *Submit Answers* button, you will get a hint.

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Question 1

4-SUM. Given an array $a[\ ]$ of N integers, the 4-SUM problem is to determine if there exist distinct indices i, j, k, and l such that $a[i] + a[j] = a[k] + a[l]$. Design an algorithm for the 4-SUM problem that takes time proportional to N^2 (under suitable technical assumptions).

Question 2

Hashing with wrong hashCode() or equals(). Suppose that you implement a data type `OlympicAthlete` for use in a `java.util.HashMap`.

- Describe what happens if you override `hashCode()` but not `equals()`.
- Describe what happens if you override `equals()` but not `hashCode()`.
- Describe what happens if you override `hashCode()` but implement `public boolean equals(OlympicAthlete that)` instead of `public boolean equals(Object that)`.

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