

Interview Questions (optional)

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1.

Java autoboxing and equals(). Consider two double values `a` and `b` and their corresponding `Double` values `x` and `y`.

- Find values such that `(a == b)` is true but `x.equals(y)` is false.
- Find values such that `(a == b)` is false but `x.equals(y)` is true.

*Note: these interview questions are ungraded and purely for your own enrichment.
To get a hint, submit a solution.*

`a`

Thank you for your response.

Hint: IEEE floating point arithmetic has some peculiar rules for `0.0`, `-0.0`, and `NaN`. Java requires that `equals()` implements an equivalence relation.



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2.

Check if a binary tree is a BST. Given a binary tree where each Node contains a key, determine whether it is a binary search tree. Use extra space proportional to the height of the tree.

a

Thank you for your response.

Hint: design a recursive function `isBST(Node x, Keymin, Keymax)` that determines whether `x` is the root of a binary search tree with all keys between `min` and `max`.



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3.

Inorder traversal with constant extra space. Design an algorithm to perform an inorder traversal of a binary search tree using only a constant amount of extra space.

a

Thank you for your response.

Hint: you may modify the BST during the traversal provided you restore it upon completion.



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4.

Web tracking. Suppose that you are tracking n web sites and m users and you want to support the following API:

- User visits a website.
- How many times has a given user visited a given site?

What data structure or data structures would you use?

a



Thank you for your response.

Hint: maintain a symbol table of symbol tables.

