

B-Trees Quiz

LASA Advanced Computer Science

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Question 1. What is one characteristic of the leaves on a B-Tree?

- (A) They are linked to other leaves on the same height
- (B) They have no children
- (C) They must be at different distances from the root node
- (D) They contain information about their parent nodes

Question 2. What was the primary goal of the B-Tree outlined by Bayer and McCreight in 1972?

- (E) Benchmark computing power
- (F) Create an intuitive, user-friendly data structure
- (G) Reduce number of disk accesses
- (H) Streamline database management systems

Question 3. What is a root node?

- (A) The first node in a tree data structure
- (B) The nodes between the first and last nodes
- (C) Nodes with leaves as children
- (D) The last nodes of a tree data structure

Question 4. If a node has n keys, then how many children c must it have?

- (E) $c =$ The order of the B-Tree, m
- (F) $c = n$
- (G) $c = n+1$

- (H) $c = n!$

Question 5. A B-Tree has an order of 4. If c is the number of children of an internal node, and m is the order (i.e. $m=4$), then what is the maximum value of c ?

- (A) 3
- (B) 4
- (C) 5
- (D) $4!$

Question 6. Suppose a value is inserted into a B-Tree, but results in a leaf having too many values (it has more values than it is intended to hold). What happens to the leaf?

- (E) The value cannot be inserted
- (F) Create children nodes for the leaf, placing values into those nodes
- (G) Split the leaf into two, promoting the middle value to the parent node
- (H) Replace the "most equal" value within the leaf with the value to be inserted

Question 7. Which of these is a difference between a B+ Tree and a B-Tree?

- (A) B+ Trees are always larger
- (B) B-Trees have data in internal nodes, while B+ Trees only have data in the leaves
- (C) B-Trees don't have data at all: just pointers
- (D) B-Trees have pointers between leaves

Question 8. Where do B-Trees tend to place similar data values?

- (E) There is no tendency
- (F) Where the distance between those data values and the root node are the same, but not necessarily in the same nodes or levels
- (G) On the same level, but not necessarily the same nodes
- (H) In the same nodes

Question 9. Given B-Tree where order $m = 3$, sequentially place the values 1, 2, 3, 4, 5, 6, and 7 in the tree.

Question 10. Using the B-Tree you made in question 9, insert the values 8 and 9.