Array Data Structure - Multiple Choice Questions

Instructions

Answer all 10 questions. Each question has 4 options (A, B, C, D). Select the most correct answer based on your understanding of arrays.

Time Limit: 20 minutes
Total Questions: 10
Passing Score: 70% (7 out of 10)

Questions

Question 1: Array Definition

What best describes an array data structure?

A) A collection of elements stored in non-contiguous memory locations
B) A collection of similar data types stored in contiguous memory locations
C) A dynamic collection that can only store integers
D) A linked sequence of nodes with pointers

Correct Answer: B

Question 2: Array Indexing

In most programming languages, what is the index of the first element in an array?

A) 1
B) 0
C) -1
D) Depends on the programming language

Correct Answer: B

Question 3: Time Complexity of Access

What is the time complexity of accessing an element in an array by its index?

A) O(n)
B) O(log n)
C) O(1)
D) $O(n^2)$

Correct Answer: C

Question 4: Array Declaration in C++

Which of the following correctly declares and initializes an array in C++?

A) `int arr[5] = {1, 2, 3, 4, 5};`
B) `array arr[5] = [1, 2, 3, 4, 5];`
C) `int arr = {1, 2, 3, 4, 5};`
D) `array[5] int = {1, 2, 3, 4, 5};`

Correct Answer: A

Question 5: Insertion Time Complexity

What is the time complexity of inserting an element in the middle of an array?

A) O(1)
B) O(n)
C) O(log n)
D) O(n log n)

Correct Answer: B

Question 6: Array Size Declaration

In Java, how is the size of an array determined after declaration?

A) Using the `length()` method
B) Using the `size()` method
C) Using the `length` property
D) Arrays cannot determine their own size in Java

Correct Answer: C

Question 7: Multidimensional Arrays

What is a 2D array?

A) An array that stores only two types of data
B) An array of arrays, organized in rows and columns
C) An array that can store only two elements
D) A dynamic array with two pointers

Correct Answer: B

Question 8: Memory Layout of 2D Arrays

How are elements of a 2D array typically stored in memory?

A) In a circular pattern
B) In row-major order (row by row) or column-major order (column by column)
C) In random locations
D) Based on the element's value

Correct Answer: B

Question 9: Array vs ArrayList

Which statement is TRUE about arrays compared to ArrayLists in Java?

A) Arrays are dynamic, ArrayLists are fixed-size
B) Arrays are fixed-size, ArrayLists are dynamic
C) Arrays and ArrayLists have identical functionality
D) Arrays can store primitives, ArrayLists cannot

Correct Answer: B

Question 10: Deletion Time Complexity

What is the time complexity of deleting an element from the beginning of an array?

A) O(1)
B) O(n)
C) O(log n)
D) $O(n^2)$

Correct Answer: B

Answer Summary

Question	Answer	Concept
1	B	Array definition
2	B	Zero-based indexing
3	C	Direct access complexity
4	A	C++ syntax
5	B	Insertion complexity
6	C	Java array properties
7	B	2D array concept
8	B	Memory storage order
9	B	Array vs ArrayList
10	B	Deletion complexity

Performance Guide

- **9-10 Correct:** Excellent understanding of array concepts
- **7-8 Correct:** Good understanding with minor gaps
- **5-6 Correct:** Adequate understanding, needs review
- **Below 5:** Requires additional study on array fundamentals

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