Data Structures Test Bank 2015

Data Structures Array

Question 1

A program P reads in 500 integers in the range [0..100] exepresenting the scores of 500 students. It then prints the frequency of each score above 50. What would be the best way for P to store the frequencies? (GATE CS 2005)

A. An array of 50 numbers

B. An array of 100 numbers

C. An array of 500 numbers

D. A dynamically allocated array of 550 numbers

Question 1 Explanation:

See question 1 of http://www.geeksforgeeks.org/data-structures-and-algorithms-set-22/

Question 2

Which of the following operations is not O(1) for an array of sorted data. You may assume that array elements are distinct.

A. Find the ith largest element

B. Delete an element

C. Find the ith smallest element

D. All of the above

Question 2 Explanation:

The worst case time complexity for deleting an element from array can become O(n).

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Question 3

The minimum number of comparisons required to determine if an integer appears more than n/2 times in a sorted array of n integers is

```
(A)  (n)
(B)  (logn)
(C)  (log*n)
(D)  (n)
```

A A

B B

C C

D D

Question 3 Explanation:

See Check for Majority Element in a sorted array

Question 4

Let A be a square matrix of size n x n. Consider the following program. What is the expected output?

```
C = 100
for i = 1 to n do
    for j = 1 to n do
    {
        Temp = A[i][j] + C
        A[i][j] = A[j][i]
        A[j][i] = Temp - C
    }
for i = 1 to n do
    for j = 1 to n do
        Output(A[i][j]);
```

A The matrix A itself

B Transpose of matrix A

C Adding 100 to the upper diagonal elements and subtracting 100 from diagonal elements of A

D None of the above

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Question 4 Explanation:

See question 3 of http://www.geeksforgeeks.org/data-structures-algorithms-set-34/

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