GeeksQuiz

Computer science mock tests for geeks

Analysis of Algorithms (Recurrences)

Question 1

What is the value of following recurrence.

```
T(n) = T(n/4) + T(n/2) + cn^2
T(1) = c
T(0) = 0
```

Where c is a positive constant

(A) $O(n^3)$

(B) $O(n^2)$

(C) $O(n^2 Logn)$

(D) $O(nLogn)$

Discuss it

Question 2

What is the value of following recurrence. T(n) = 5T(n/5) + [ ], T(1) = 1, T(0) = 0

(A) Theta (n)

(B) Theta (n^2)

(C) Theta (sqrt(n))

(D) Theta (nLogn)

Discuss it

Question 3

What is the worst case time complexity of following implementation of subset sum problem.

```cpp
// Returns true if there is a subset of set[] with sun equal
bool isSubsetSum(int set[], int n, int sum)
{
    // Base Cases
    if (sum == 0)
      return true;
    if (n == 0 && sum != 0)
      return false;

    // If last element is greater than sum, then ignore it
    if (set[n-1] > sum)
      return isSubsetSum(set, n-1, sum);

    /* else, check if sum can be obtained by any of the follow
       (a) including the last element
       (b) excluding the last element  */
    return isSubsetSum(set, n-1, sum) ||
           isSubsetSum(set, n-1, sum-set[n-1]);
```

```
}
```

A O(n * 2^n)

B O(n^2)

C O(n^2 * 2^n)

D O(2^n)

Discuss it

Question 4

Suppose $T(n) = 2T(n/2) + n$, $T(0) = T(1) = 1$ Which one of the following is false. (
GATE CS 2005)
a) $T(n) = O(n^2)$
b) $T(n) = \square(n\log n)$
c) $T(n) = \square(n^2)$
d) $T(n) = O(n\log n)$

A A

B B

C C

D D

Recent Discussions

Discuss it

Question 5

Consider the following recurrence:

$$T(n) = 2T\left(\left\lceil \sqrt{n} \right\rceil\right) + 1, T(1) = 1$$

Which one of the following is true?

(A) T(n) = Θ(loglogn)
(B) T(n) = Θ(logn)
(C) T(n) = Θ(sqrt(n))
(D) T(n) = Θ(n)

A   A

B   B

C   C

D   D

Discuss it

Question 6

The running time of an algorithm is represented by the following recurrence relation:

```
if  n <= 3  then   T(n) = n
else T(n) = T(n/3) + cn
```

Which one of the following represents the time complexity of the algorithm?

(A) Θ(n)
(B) Θ(n log n)
(C) Θ(n^2)

(D) $\square$(n^2log n)

(A) A

(B) B

(C) C

(D) D

Discuss it

Question 7

The running time of the following algorithm

```
 Procedure A(n)
 If n <= 2 return(1) else return A(        );
```

is best described by

(A) O(n)

(B) O(log n)

(C) O(1og log n)

(D) O(1)

Discuss it
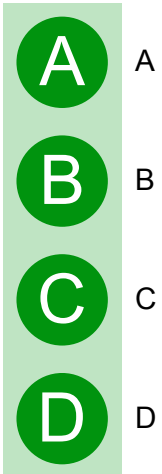
Are you a developer? Try out the HTML to PDF API

Question 8

What is the time complexity of the following recursive function:

```c
int DoSomething (int n)
{
  if (n <= 2)
    return 1;
  else
    return (DoSomething (floor(sqrt(n))) + n);
}
```

(A) ☐ (n)
(B) ☐ (nlogn)
(C) ☐ (logn)
(D) ☐ (loglogn)

A   A

B   B

C   C

D   D

Discuss it

Question 9

The time complexity of the following C function is (assume n > 0 (GATE CS 2004)

```c
int recursive (mt n)
{
   if (n == 1)
     return (1);
   else
     return (recursive (n-1) + recursive (n-1));
```

```
}
```

A O(n)

B O(nlogn)

C O(n^2)

D O(2^n)

Discuss it

Question 10

Consider the following recurrence T(n) = 3T(n/5) + lgn * lgn What is the value of T(n)?

(A) [   ]

(B) [   ]

(c) [   ]

(D) [   ]

A A

B B

C C

D D

Question 11

Consider the following recurrence. T(n) = T(⬚) + ⬚ What is the value of recurrence?

(A) ⬚
(B) ⬚
(B) ⬚
(B) ⬚

(A) A

(B) B

(C) C

(D) D

Question 12

Which one of the following correctly determines the solution of the recurrence relation with T(1) = 1?

```
T(n) = 2T(n/2) + Logn
```

(A) $\Theta(n)$

(B) $\Theta(nLogn)$

C Θ(n*n)

D Θ(log n)

Discuss it

There are 12 questions to complete.

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