DESIGN AND ANALYSIS OF ALGORITHM 01 CT 0512

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(1)
$$T(n) = 3T(\frac{n}{2}) + n^2$$
 $q = 3$

case 3:
$$a < b^k$$

$$p = 0$$

$$3 < 2^{2}$$

Assignment - 3

Q Calculate Oroden of Complexity Using Theorem:

(1)
$$T(n) = 3T(\frac{n}{2}) + n^2$$
 q

Assignment - 3

(1) $T(n) = 3T(\frac{n}{2}) + n^2$ q

(2) $T(n) = 4T(\frac{n}{2}) + n^2$ q

(3) $p > 0$, $T(n) = O(n^2 \log^2 n)$ q

(4) $T(n) = O(n^2 \log^2 n)$ q

(5) $T(n) = O(n^2 \log^2 n)$ q

(6) $T(n) = O(n^2 \log^2 n)$ q

(7) $T(n) = O(n^2 \log^2 n)$ q

(8) $T(n) = O(n^2 \log^2 n)$ q

(9) $T(n) = O(n^2 \log^2 n)$ q

(10) $T(n) = O(n^2 \log^2 n)$ q

(11) $T(n) = O(n^2 \log^2 n)$ q

(12) $T(n) = O(n^2 \log^2 n)$ q

(2) $T(n) = O(n^2 \log^2 n)$ q

(3) $T(n) = O(n^2 \log^2 n)$ q

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(15) $T(n) = O(n^2 \log^2 n)$ q

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(20) $T(n) = O(n^2 \log^2 n)$ q

(21) $T(n) = O(n^2 \log^2 n)$ q

(22) $T(n) = O(n^2 \log^2 n)$ q

(33) q

(44) $T(n) = O(n^2 \log^2 n)$ q

(45) q

(5) $T(n) = O(n^2 \log^2 n)$ q

(6) $T(n) = O(n^2 \log^2 n)$ q

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(10) $T(n) = O(n^2 \log^2 n)$ q

(11) $T(n) = O(n^2 \log^2 n)$ q

(12) $T(n) = O(n^2 \log^2 n)$ q

(13) $T(n) = O(n^2 \log^2 n)$ q

(14) $T(n) = O(n^2 \log^2 n)$ q

(15) $T(n) = O(n^2 \log^2 n)$ q

(16) $T(n) = O(n^2 \log^2 n)$ q

(17) $T(n) = O(n^2 \log^2 n)$ q

(18) $T(n) = O(n^2 \log^2 n)$

(2)
$$T(n) = 4T(\frac{n}{2}) + n^2$$

case
$$2 : a = b$$

(a)
$$p > -1$$
 $T(n) = O(n^{\log n} \log^{p+1} n)$

$$= O(n^{\log \frac{1}{2}} \log n)$$

$$= O(n^{2} \log n)$$

$$= O(n^2)$$

$$a=4 \qquad k=2$$

b = 2

P = 0

 $T(n) = O(n^2 \log^2 n)$

(3)
$$T(n) = T(\frac{n}{2}) + n^2$$
 $a = 1$ $k = 2$ $b = 2$ $p = 0$ $a = 1$

$$= O(n^2)$$

(4)
$$T(n) = 16 T(\frac{\Lambda}{4}) + n$$
 $a = 16 k = 1$ $b = 4 P = 0$

$$T(n) = O(n^{\log \frac{\alpha}{2}}) = O(n^{\log \frac{1}{\alpha}})$$

$$= O(n^2)$$

(5)
$$T(n) = 2T(\frac{n}{2}) + n\log n$$
 $q = 2 k^{-1}$

(a)
$$p > -1$$
; $T(n) = O(n^{\log a} \log^{p+1} n)$

$$= O(n^{\log_2^2} \log^2 n)$$

(6)
$$T(n) = 2T(\frac{n}{2}) + \frac{n}{1090}$$
 $a = 2$ $k = 1$

(b)
$$p = -1$$
; $T(n) = O(n^{\log \log n})$

(7)
$$T(n) = 2T(\frac{n}{4}) + n^{0.51}$$
 $q=2$ $k=0.51$ $b=4$ $p=0$

$$= O(n^{0.60} \log n)$$

(8)
$$T(n) = 8T(\frac{n}{3}) + n^2 \log n$$
 $q = 8 + 2$

$$b = 3 + p = 1$$

(a)
$$T(n) = 7T(\frac{n}{3}) + n^2$$
 $a = 7 + k = 2$
 $b = 3 + p = 0$

(a)
$$p7/0$$
; $T(n) = O(n^2 \log^0 n)$

(10)
$$T(n) = 4T(\frac{n}{2}) + \log n$$
 $case 1 : a > b^{k}$
 $T(n) = O(n^{\log_{2} n})$
 $= O(n^{(\log_{2} k)}) = O(n^{2})$

(11) $T(n) = 16T(\frac{n}{4}) + n!$
 $case 3 : a < b^{k}$

(a) $p > 0 : T(n) = O(n^{\log_{2} n})$
 $= O(n^{\log_{2} n})$

(12) $T(n) = 3T(\frac{n}{2}) + n$
 $= O(n^{\log_{2} n})$
 $= O(n^{\log_{2} n})$

(13) $T(n) = 3T(\frac{n}{4}) + n\log_{2} n$
 $= O(n^{\log_{2} n})$

(a) $p > 0 : T(n) = O(n^{\log_{2} n})$
 $= O(n\log_{2} n)$

1-1

//_ (14) $T(0) = 3T(\frac{2}{3}) + \frac{2}{3}$ 6 - 3 case 1: as bk T(n) = O(n 109 ") = 0 (n log,3) = 0(n) 2 9 $T(n) = 2T\left(\frac{n}{2}\right) + n$ (15) K = 1 0 (a) p > -1; $T(n) = O(n^{\log_0^{p+1}} \log_1^{p+1} n)$ = 0 (n log 2 log n) = O(n logn) 1 1 1 .