Tutosal-4

Sheatenh Komon Dhusu (680:11) Pollino = 03 dem= 4th.

(1) $T(u) = 3T(h/2) + u^2$.

a=3 b=2, $n \log b^a = n \log_2 3$

Now, ndog23 < n2 (6a08 3).

.. accoording to masteris thm: $T(n) = \theta(n^2)$

(2) T(n) = 4T (n/2) + n2.

a = 4 , b = 2

 $n \log_2 4 = n^2 = y(n)$ (Gass 2)

.. according to unastours thu: $T(u) = \theta(rs^2 \log u)$.

(3) T(n) = T(n)2)+2h.

a = 1

h = 2

 $n \log_2 1 = n^\circ = 4$

Clearly 4 < 24 (Gase 3)

.. according to master's thun: T(m) = O(2").

(4) T(n)= 2hT (n/2) + nh.

This can't be solved using Masteri's them as a defends on n.

(5) T(n) = 16T (n/4) + n a = 16, b = 4. n dogba = n dog 4 16 = n2

NOW, n2> Jan - n (Gas 1)

.. According to unastor's thu, T(u) = O(n2)

(6) T(u) = NT(N/2) + n dogn. a= 2, b=2

udogba = ndog22 = n' = n

Now, mologinatyon) = mologu. (6000 2)

.. According to moster's thu: T(u)- O(ulgin).

(4) T(n)= QT(n/2)+n/dogn.

10 Mastrous thu is not applicable some foly would fa.

(8) T(U) = QT (N)+)+ n0.51

a = 2 , b = 4

n dogy 2 = n0.5

no.5 × no.51 = you) (case 3)

". according to masteris thus: T(u). O(no.51)

(9) T(u) = 0.5 T(n/2) + 1/n

Marter's them is most applicable since a < 4.

(10) T(u) = 16T (n/4)+n1

I n! Can be written as La a = 16.

u4. (Polynomial)

ndogba = nlogya > w²

 $n^2 < n1$ (cos 3).

.: according to mester's thus: \(\(\(\mu \) = \theta(\(\mu \)) = \theta(\(\mu \)).

(11) T(u) = 4T(u/2) + dogu.

e=41b=2

n log 69 = n log 24

n2 > dogu = jan (lass 1)

.: according to unasterios thm; Tan) - O(12).

- (12) -(u) = 69,00 (u) T(10/2) + logu.
 - Le Masters the ions applicable sence squot (n) ionst.
- (13) -(n)= 3T(n/2)+h. a=3,b=2.

ulog69 = ilog23 = n1.58

n 1.58 yn (y'st (ans).

.. According to Masteer's thus; T(u) = 0 (n deg 23).

(14) . T (N) = 3T (W/3) + Jh.

a=3,b=3

n logba = n log33 = nol

n > Jh (Case 4)

.. According to Mastero's thm, Tw) = O(n).

(15) T(u) = 4T (10/2) + Gn.

a= 4, b= 2.

n dog 69 = n dog 204 = n 2

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.. According to master's them: T(n)=0(n2).

(6) $T(n) = 3T(n/4) + n \log n$. a = 3, b = 4. a = 3, b = 4. a = 3, b = 4.

n 0.79 r u logn (Case 3).

.: according to masters thum: T(u)= 0 (ulega).

(7) T(u) = BT (w/3) + w/2

a = 8, 6=5

n log 69 = u log 33 = n'

0 (n) = 0 (n/2) (cone-2),

- · according to maston's thus, T(u) = O(udgu).

(18). T(w) = 6+ (n/3) + n2 Logn.

q=6,b=3,

n log 8 6 = n2

n² z n²dogu (lare 3)

· according to mouston's them 17(1)= O(n2loger)

19) $T(n) = 4 + (n/2) + n/\log n$. a = 4, b = 2. $n \log 6 = n \log 2^{4} = n^{2}$.

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" exceeding to masterio the: TCM = 0 (n2).

(50). T(n)=64 T (n/8)-n2 logu,

L Masters thm is most applicable since

y(n) is negative.

(a) $7T(n/3) + n^2$ a = 7, b = 3 $n \log b^9 = n \log a^7 = h^{1/7}$

n1.7 < n2 (come 3)

La corcooding to masters thun; 7 (u) = 0 (u2)

(22) T(n) = T(n/2) + n (Q-600n)

La Masterio tim ionit applicable some orgalosisty andition is violated in case 3.