Tutorial - 4

Masker Theoren-

The masks Theosen applies to securences of the following form: T(n)= aT(n/b) + f(n) where a>11 and b>1 are constants and fln) is an asymptotically Positive function.

Q1) T(n)= 3T(n/2)+n2

- a=3,b=2, f(n):n2 n 10969 = n 10323 Comparanj = mlog 2 and m2

nlog23 < n2 (case 3)

. , according to master Theorem T(n) = O(n2)

Q2) T(n) = 4T (n12)+ n2

a=4, b=2

nlog ba = nlog 24 = n2 = f(m) [case 2]

... according to masters thewsen T(n)= O(n2/0,9 n)

Q3) T(n)=T(n/2)+2h

- a=1, b=2

n log 21 = no =/

=>/1<2 h (case 3) .'. According to Maskos theorem T(n) = 0(2n)

Q4) T(n) = 2hT (n/2) + nh

- . . Masker's theorem is not applicable as a us function of n.

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05) T(n)= 16T(n/4) +n
       a=16, b=4 1 f(m)=n
        nlogb9 = nlogy16 = n2
                 n27f(n) (couse 1)
                 ., T(n) = O(n2)
Q6) T(m)= 2T(m/2) + m/0gm
       a=2, b=2, f(n)=nlogn
       n 10969 = n 10922 = n
        Now fcn)>n
          ... According to Maskers T(n)= O(nlogn)
 (1) T(n)= 2T(n/2)+ m/109n
 -> a=2, b=2, f(n)= m
     nlogo : nlog 22 = n
        m 7 f(n)
      . '. According to master theorem T(n): O(n)
  8) T(n)= 2T (n/4)+ no.21
        9 = 2, b=4, f(n)= n0.51
         nlog64 = nlog42 = nois
         No.2 T t(N)
         . . According masks theorem T(n) = O(n°'s)
       T(n)= 0.57(n12)+12
   (9)
          . Masters Not applicable as all
        T(n)=16T(n14)+n!
   (10)
           a=16, b=4, f(n)=n!
          nlo86a = nlogy16 = n2
            . . According to masters , T(n) = a(n))
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-> a=41 b=> 1f(n)=logn
    7/09 pa = 7/09, 4 = 22
     N2 > f(N)
    · · According to masker's , T(n)= O(n2)
12) T(n)= Sqst(n)+ (n/2)+ logn
-> .'. Maskr's Not applicable as a in not constant.
13) T(n) = 3T (m/2) +n
 -> 9=3, b:2, f(n)=n
      21.3Pd = 21083 = 21.20
      n1.58 > f(n)
        . . According to master's theasen, T(n) = 0 (n'0923)
 14) て(か)=37(か13)ナイが
 - a=3, b=3, f(n)=Vn
      nlogba = nlog 33 = n
           ハッショ
        -'. According to masters theorem, T(n) = Q(n)
 15) T(m)=47 (M/2)+(n
         a 24, b= 2, fen)= can
         nlog 69 = nlog 24 = n2
           m2) C+ ~
        -. According to masters theosem, T(n) = O(n2)
  16) T(n)= ST (M/4)+ nlogn
          9=3, b=4, f(n): nlogn
          n 103 69 = n 10343 = n0.79
             noira < nlogn
          . . According to masters theorem, T(n) = O(nlogn)
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11) 1411 ... 411 0...