Name: Ishu Verma Section: CST SPL 2 Clars Rolling: 04 University Rolln 0: 2016790 DAA Tutorial 1 Asymptotic notations are the mathematical notations used to describe running time of an algorithm when the input tends towards a Annalation value or a limiting value Asymptotic notations are mainly contegorised

Big O notation - It gives the worst case complexity.

Omega notation- It gives the best case complexity.

Theta notation- It gives the average case complexity.

into following 3 types.

Bubble sort algorithm has O(n) time complexity in best case and  $O(n^2)$  time complexity in worst case and O(n2) in average case.

for (i=1 to n) <u>i=i \* 2j</u>

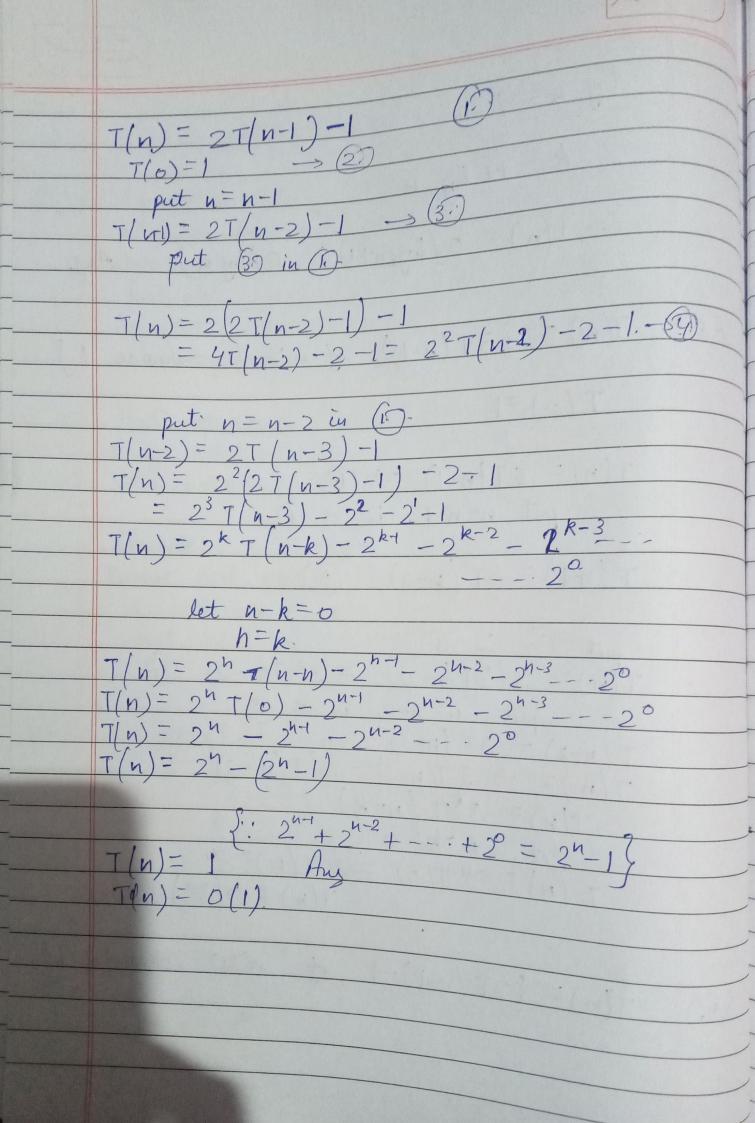
n -> 9.P 1=1,2,4,8,--

 $a_{k} = a_{k}^{k-1}$   $a_{k} = 1 \cdot 2^{k-1}$   $n = 2^{k-1}$ a=1, r=2

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log_n= k-1
           k= 1+ 6924
         :. T(n) = 0 (log2n+1) = 0 (logn) Aug.
 &3.) T(n) = {3T(n-1) if n>0, otherwise 13
         T(0)=1.
        T(n) = 3T(n-1) \rightarrow (\overline{n})

put n=n-1 in eq. (\overline{n})
       T(n-1) = 3T(n-2) (3:)
       put (3) in (1)

T(n) = 3(3T(n-2)) = 3^2 T(n-2) (9)
       T(n-2) = 3T(n-3)
T(n) = 3^2 3T(n-3) = 3^3T(n-3)
T(n) = 3^kT(n-k)
           let n-k=0
          T(n) = 3^{n} T(0) = T(n) = 3^{n}
                             T(n) = 0(3n) Ang
84) T(n)= {2T(n-1)-1 if n70, otherwise 14
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(5) int i=1, s=1;
        while (sc=n)
       λ= s+i;

Printf("#");
               1=1
       i=2. s=3 s=1+2+3

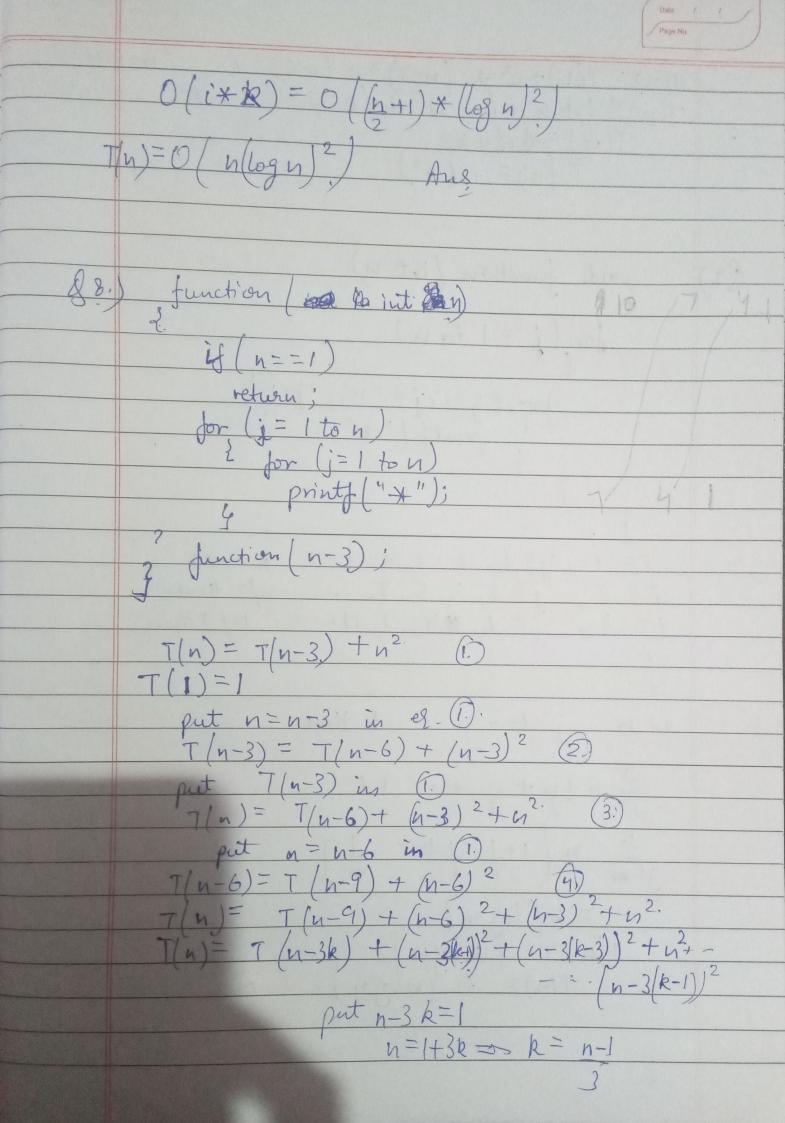
i=3 s=6 s=1+2+3
                                1=1+2+3
                               5= 1+2+3+4
        3=1+2+3+4+-+k= k(k+1) >n (:s(=u)
        J = k^2 + R > n.
       R 7 Ju
    T(n)=0 (Jn) Aug
 6) roid function (int n)

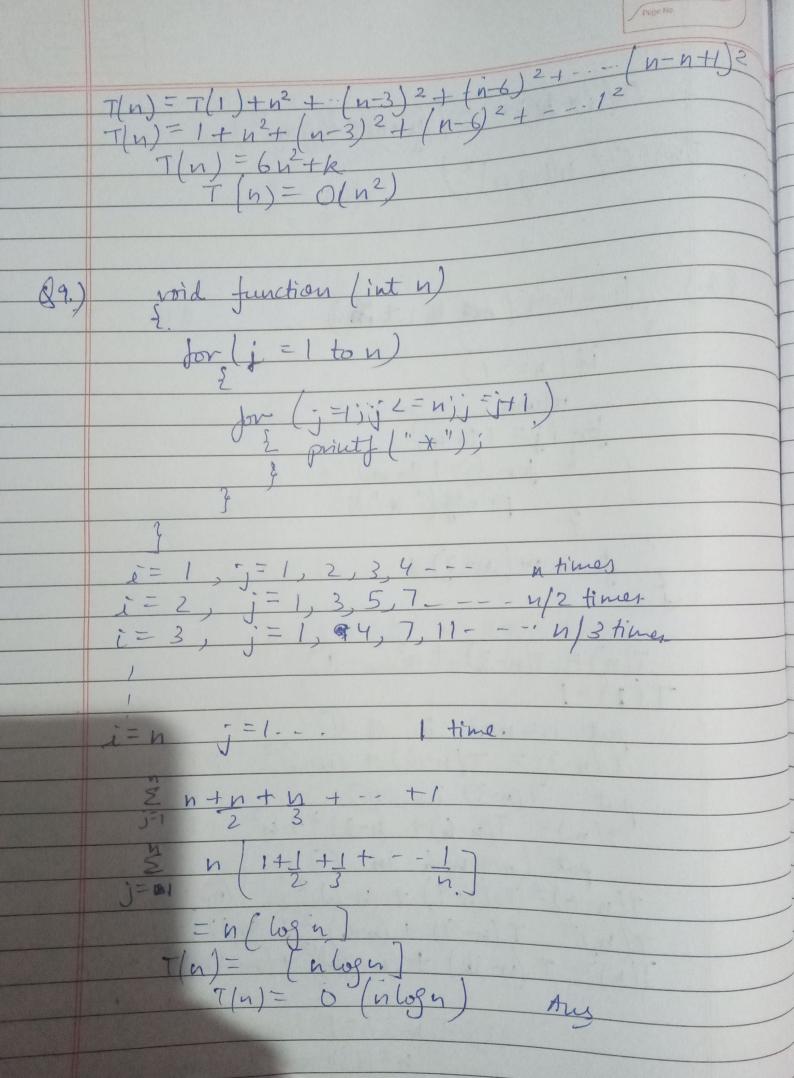
{ int i, count = 0;

fr (i=1; i x i <= n; i++)

{ count ++;
              = 1, 2, 3, -- h
2 = 1, 2^{2}, 3^{2} -- h
             1 € 2 = n.
=>i <= (Tn
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 $a_{k} = a + (k-1)d$   $a_{k} =$ gr.) void function (int n) int i), k, count = 0; for (i=n/2; i<=n; i+t) for (j=1)j2=n')j=j\*2) for (k=1) k=n; k== k+2 { count ++; (log 1)2. ma 4 + 1 times





 $n^{k} = 0(c^{n})$ as  $n^{k} < = a.c^{n}$ for n = 1  $c^{2} = 2$ + n3 no 1RZ= Q2