Basis: \(\frac{1}{2} \) \text{the function divide } \(2, \frac{1}{2} \) \text{ setions} \((0, 0) \) \(\text{S.t.} \text{2.0} \) \(\text{Hospitalisis} : \] \(\text{lol divide } \((k, y) = (a, b) \) \(\text{S.t.} \text{k.2}	Breplem : 3	
S.t. 2: 0(y) * 0 = 0 Basis helds Induction Hypothesis: Led divide (K,y) = (a,b) St. K: ya+b, 230, 0 < b \(\sum_{y} \) The months of the standard by Algo] I x-2K (9, 9) * divide (K, y) BA = (2,b) By IH 91: 2a 91: 2b I.1 it 2b < y then (2a,2b) i.e. 2x: (2a) · y + 2b by IH K: 0y+b \(\sum_{y} \) > 2K = 2ay+2b Also 2a > 0 \(\sum_{y} \) > 2b \(\sum_{y} \) Induction Hypothesis: Induction Hypothesis:		(0,0)
Induction Hypothesia: lat divide (K,y) = (a,b) 320 , 0≤b≤y Tinduction Step: [Bom Rosse, BA means By Algo]	s.t. x: o(4)+0=0	
Induction Hypothesia: [a] divide (K,y) = (9,b) St. K = ya + b; 230, 05b & y Induction Step: [Beam Peace, BA means By Algo] [Q-37!* I : x = 2K (9, 9) * divide (K,y) BA = (9,b) By IH 91 = 20 91 = 2b I.1 15 2b < y then (20) y + 2b by IH K = 0y + b		
Let divide (K,y) = (a,b) St	1- por 112 so 112 site site 12 .	
Lot divide (K,y) = (a,b) St	Induction Hypothesis:	
St K: ya+b , Q > 0	lot divide (Ky) = (a,b)	
Induction Step: [Geom horse, BA means By Algo] [Question of the property of	s.t. K= ya+b; a>o, 0 < b < y	
[Esom Borre, BA means By Algo] $(y, y) = \frac{1}{2}$ $(y, y) = 1$	The state of the s	
[Som Bore, BA means By Algo] $(q, s) \cdot divide(k, y) = BA$ $= (Q, b) = By IH$ $q1 = 2a$ $s1 = 2b$ I.1 $b = 2b = 2b$ $ten(2a, 2b)$ $ten(2a, 2b)$ $ten(2a, 2b)$ $ten(2a, 2b) = 2b = 2ay + 2b$ $ten(2a, 2b) = 2ay + 2b$ t	Tonduction Cleb:	
I $x=2K$ $(q, n) = divide(k, y)$ $= (q, b)$ $= (q,$	[From Rose BA means By Algo]	
I $x=2K$ (q, x) = divide (k, y) BA = (Q,b) By IH 91 = 2a 91 = 2b I.1 ib 2b < y then (2a,2b) i.e. $2K = (2a) \times y + 2b$ by IH $K = ay + b$ $\Rightarrow 2K = 2ay + 2b$ Also $2a \ge 0$ $\Rightarrow 2b \le y$ (By Gee) I.2 if $2b \ge y$ then $(2a+1, 2b-y)$ By IH $K = ay + b$ $2K = 2ay + 2b$ $2K = (2a+1)y + (2b-y)$ S.t. $2a+1 \ge 0$ $0 \le 2b \ge y$ ($2b \ge y$ A $2b \le y$) I $x = 2k+1$	for the state of t	
(9,9) = divaide (x,y) BA = (2,b) By IH 91: 2a 9:1 = 2b I.1 \$\frac{1}{2}b < \frac{1}{2}b \text{then (2a,2b)} i.e. 2x = (2a) \times \frac{1}{2} + 2b \text{by IH } K = ay + b \times 2k = 2ay + 2b Also 2a \times 0 \times 2\times 0 \leq 2b \leq y (By Gee) I.2 if 2b \times y \text{then (2a+1, 2b-y)} By IH K = ay + b 2K = 2ay + 2b 2k = (2a+1)y + (2b-y) S.t. 2a+1 \times 0 \leq 2b - y \leq y \leq \times 2b \times y \text{b \leq y} II : \times 2 = 2b + 1		
= (Q,b) By IH 91: 2a 91: 2b I.1 it $2b < y$ then $(2a,2b)$ i.e. $2k = (2a) \times y + 2b$ by IH $k = 0y + b \Rightarrow 2k = 2ay + 2b$ Also $2a \ge 0$. $a \ge 0$ $0 \le 2b \le y$ (By Gee.) I.2 it $2b \ge y$ then $(2a+1, 2b-y)$ By IH $k = ay + b$ $2k = 2ay + 2b$ 2k = (2a+1)y + (2b-y) $5:t. 2a+1 \ge 0 \le 2b \le y$ ($2b \ge y$ d.) II $x = 2k+1$	(9, 92) = divside (1, 4) BA	
$9.1 = 2b$ I.1 it $2b < y$ then $(2a, 2b)$ i.e. $2k = (2a) \times y + 2b$ by IH $k = 0y + b \Rightarrow 2k = 2ay + 2b$ Also $2a \ge 0$. $a \ge 0$. $0 \le 2b \le y$ (By Gaze) T.2 if $2b \ge y$ then $(2a+1, 2b-y)$ By IH $k = ay + b$ $2k = 2ay + 2b$ $2k = (2a+1)y + (2b-y)$ S.t. $2a+1 \ge 0$ Os $2b - y \le y$ ($2b \ge y$ decay) I : $x = 2k+1$		
$9.1 = 2b$ I.1 it $2b < y$ then $(2a, 2b)$ i.e. $2k = (2a) \times y + 2b$ by $TH = k = ay + b$ $\Rightarrow 2k = 2ay + 2b$ Also $2a \ge 0$ $\Rightarrow 2k = 2ay + 2b$ I.2 if $2b > y$ then $(2a+1, 2b-y)$ By $TH = k = ay + b$ $2k = 2ay + 2b$ $2k = (2a+1)y + (2b-y)$ S.t. $2a+1 \ge 0$ $0 \le 2b - y \le y$ $(x \ge 2b \ge y)$ II: $x = 2k+1$ $y = 2b+1$	91 = 2a	Table 1
then $(2a, 2b)$ i.e. $2x = (2a) \times y + 2b$ by IM $K = 0y + b \Rightarrow 2K = 2ay + 2b$ Also $2a \ge 0 \Rightarrow 2b \le y$ (By Gee) T.2 if $2b \ge y$ then $(2a+1, 2b-y)$ By IM $K = ay + b \Rightarrow 2K = 2ay + 2b$ $2K = (2a+1)y + (2b-y)$ S.t. $2a+1 \ge 0 \Rightarrow 2k = 2ay + 2b$ $5 \le 2a + 1 \ge 0 \Rightarrow 2k = 2ay + 2b$ $2k = (2a+1)y + (2b-y)$ $3x = 2k + 1 \Rightarrow 2x = 2ay + 2b$		
then $(2a, 2b)$ i.e. $2k = (2a) \times y + 2b$ by $JH K = 0y + b \implies 2k = 2ay + 2b$ Also $2a \ge 0 \implies a \ge 0 0 \le 2b \le y (By Gee)$ $J = 2b \ge y (By Gee)$	I.1 1 2 b < y	
by IH $K = ay + b$ $\Rightarrow 2K = 2ay + 2b$ Also $2a \ge 0$ $\therefore a \ge 0$ $0 \le 2b \le y$ (By Gee) T. 2 if $2b \ge y$ then $(2a+1, 2b-y)$ By IH $K = ay + b$ $2K = 2ay + 2b$ $2K = (2a+1)y + (2b-y)$ S.t. $2a+1 \ge 0$ $0 \le 2b - y \le y$ ($\therefore 2b \ge y$ d $b \le y$) II: $x = 2k + 1$	then (2a, 2b)	
by IH $K = ay + b$ $\Rightarrow 2K = 2ay + 2b$ Also $2a \ge 0$ $\therefore a \ge 0$ $0 \le 2b \le y$ (By Gee) T. 2 if $2b \ge y$ then $(2a+1, 2b-y)$ By IH $K = ay + b$ $2K = 2ay + 2b$ $2K = (2a+1)y + (2b-y)$ S.t. $2a+1 \ge 0$ $0 \le 2b - y \le y$ ($\therefore 2b \ge y$ d $b \le y$) II: $x = 2k + 1$	i.e. 2x = (2a) xy + 2b	
Also $2a > 0$. $a > 0$. $a > 0$ T. 2 if $a > 0$. $a > 0$ Then $(2a+1, 2b-y)$ By IH $k = ay + b$ $2k = 2ay + 2b$ $2k = (2a+1)y + (2b-y)$ S.t. $2a+1 > 0$ 052b-y $\leq y$ ($2b > y$ d $a > 0$ If $a > 0$	$\Rightarrow 2k = 2ay + 2b$	(B (000)
T. 2 if $2b > y$ then $(2a+1, 2b-y)$ By IH $K = ay+b$ $2K = 2ay+2b$ 2K = (2a+1)y + (2b-y) $5 \cdot t \cdot 2a+1 > 0$ $052b-y = y$ $(\cdot \cdot \cdot \cdot 2b > y d$ b = y $)II : x = 2k+19:2 = 2b+1$	Also 2a 30 , a 30 0 = 20 mg	Ly Ose
then $(2a+1, 2b-y)$ By IH $K = ay+b$ $2K = 2ay+2b$ $2K = (2a+1)y + (2b-y)$ $5 \cdot t \cdot 2a+1 \ge 0$	J.2 if 2579	
$2k = (2a+1)y + (2b-y)$ $5 \cdot t \cdot 2a+1 > 0 0 \le 2b - y \le y (: : 2b > y)$ $1 = x = 2k+1$ $9 \cdot 2 = 2b+1$	then (2001, 25-4)	
$2k = (2a+1)y + (2b-y)$ $5 \cdot t \cdot 2a+1 > 0 0 \le 2b-y \le y (: : 2b > y)$ $1 = x = 2k+1$ $9 \cdot 2 = 2b+1$	By IH K= ay+b 2K = 2ay+2b	
II: $\chi = 2k+1$ 9:2 = 2b+1	5 (2) (12)	2 4 &
9.2 = 26+1	s.t. 2a+170 052b-ymy b m	4)
9-2 = 26+1	$II: \chi=2k+1$	
	9-2 = 26+1	
II.1 (2b+1<4) then (2a, 2b+1)	II.1 (2b+1<4) then (2a, 2b+1)	

Teacher's Signature S.t. 2K+1= 2ay+(2b+1) By IH K = ay + b => 2K = 2ay + 2b : 2K+1 = 2ay + (2b+1) S.t. 2020 25-14 05261 < 4 (By Case Cord M) I.2 (2b+1 > y) then (2a+1, 2b+1=y) By IH K= ay+b 2K+1 = 2ay + 2b+1 = (2a-1) y+ (2b+1-4) 0 < 2 b+ - y < y : 2b+17,4 & 2b+1 < 24 Since the June is recurring :. T(m)= \$T(m div 2) + O(1)

T(m)= 0 (log_m)

Let 7(0)20

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