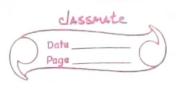
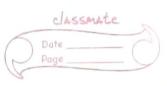
	TUTORIAL -2
	The Line of the Control of the Contr
01	What is the time comparity of below
	What is the time complority of below Void fur (int n)
	i + N = 1; i = 0
	int $j=1$; $i=0$ uplify $(i < n)$?
	i = i + 1
	ý++; 3
	3
Ans	i=0 1 3 6 2 10 bt saw K time
/ 1/45/	So viven horm would be
	So given form mould be K(K+1)
	2
	$K^{\pm 2}$ tour $h = K(K+1) = n$
	2
	$k^2 + k = 2n$
	$k^2 = n$
	K=In
	Time conflictly $h = O(Jn)$
02	Write securierce golation for the occursion
	function that paintes bibonacci series. Solve
	the seconserve relation to get the time
	complority of this peopean and unly.
AnolZ	int fib (int n) 2
	art $(n = 1) \leftrightarrow O(1) = i$
	setion n;
	action fib (n-1)+ fib (n-2)→ Th-1) + T(n-2)
	3
	Recurrence relation T(n) = T(n-1)+T(n-2)+C
	Now $T(n-1) \simeq T(n-2)$



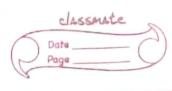
	Tn = 2T(n-1)+C
	By backwood substitution $T(n-1) = 2T(n-1-1) + (3)2T(n-2) + (6)$
	T(n) = 2 C2T(n-2) + CJ + C
	= 47(n-2)+3C
	Now $T(n-2) = 2T(n-2-1)+C$
	=27(n-3)+0
	T(n) = 4T(n-2) + 3C
	= 4 (2 T(n-3) + c) + 3c
	T(n) = 8T(n-3) + 7c
	grocolizing: 2KT (n-K)+(2K-1) C
	source $n-k=0 \Rightarrow n-\emptyset K$
	$=2^{n}+(0)+(2^{n}-1)c$
	$=2^{n}+(2^{n}-1)($
	$= 2^{n} + (2^{n} - 1) c$
	$=2^n$
	Time comploxity = 0(2 n)
	<i>'</i>
	Space composity:
	For pronaci space required in directly a
	to macinum dette of Recussion toa.
	For filonaci space required in directly a to maximum defth of Rocussion toa. Since more defth is dia to no of almosts.
93	White a Scopean which have comforty
	n (log n)
0	goz (i=1; i≤ n; i+) €
	$\frac{g_{oq}(j=1;j=n;j=j*2)}{2 \text{sum} = \text{sum} + (j)}$
	2 sun = sun +(;
	3



<u> </u>	n^3 Om $(i-A-i-m-i+1)$ \leq
	n^3 for $(i=0; i=n; i+t)$ ε
	for(j=0;j< n;j+t) $for(k=0;k=n;k+t)$
	Sum = Sun + K;
	3
	3
	3
3	$\log n(\log n)$ $\log (i=1; i=n; i=i*2)$ $\log (k-1; k-1, k-1, k-1)$
	goz (i=1; i=n; i=i*2)
	GOZ (- 1) (- 1) (- 2)
	Sun = Sun + j
	3
	3
	3
0.11	
04	Solve the securosence solution
Λ 1/	$T(n) = T(n/4) + T(n/2) + (n^2)$ T(n/4) = T(n/2)
Any	$T(n) = 2T(n/2) + Cn^2$
	$f(\pi) = 2f(\pi) = 2f(\pi)$
	$a \ge 1$ and $b \ge 1$
	Ru wing moster's mothed
	By using moster's mothed $f(n) = f(n/b) + f(n)$
	$R(n) > n > (n^2) n^c$
	$7(n) = O(f(n))$ $O(n^2)$
	0 (n ²)
05	What is the time complexity of
	What is the time complexity of bollowing from ().



	int fun (int n) for (int $i=1$; $i=n$; $i+1$) q for (int $j=1$; $j \in n$; $j+1$) q Some $O(1)$ trade 333
	Box (int i -1: 100 n : 1+ 56) {
	(am O(1) trade 3 3 3
	SOM CC)
Angs 5	Box (=1 → 1+2+3+ · · · (n+1)=n
	Bor (=3 → 1+4+7+ - ··n → n/2 βor (=3 → 1+4+7+ - ··n → n/3
	for i=3 > 1+4+7+ · n > n/3
	$\frac{n+n+n+\cdots+1}{2}$
	$\Rightarrow n(1+1+1+\cdots+1)$
	Now up Popul
	Now up from $n(1+1+\cdots+1) \leq n(1+1+1+\cdots+1)$ $\geq 3 \qquad n$
	$n(1+1+1+\cdots 1) \leq n(1+0.5-\cdots)$
	O(nlogn)
07	Abrite a recurrence relation color
	quick nort respondedly divides the sony
	Ac show the secressive the time
	composity the difference in leight of both the octome foots what do
	you understand by the analysis.
	again market of
Ars 7	49 to 1 in suich sort
,	upen fixet is whoo from forent or
	and duais.
	$T(n) = \frac{1}{7}(99/100) + T(n/100) + O(n)$



	-T(n)
	T(99n) T(n/bo)
	$\frac{7/99)^2}{(100)^2} \times n$ $\frac{7/99n}{(100)^2}$ $\frac{7/99n}{(100)^2}$ $\frac{7/n}{(190)^2}$
	199 1K
	$n = \frac{77}{100}$
	$\partial s \alpha n = K \partial s \alpha 99$
	$\log n = k \log \frac{99}{190}$
	K = log n loo
	Time composity = n log
08	Agana the bollowing in increasing order
	Agang the following in increasing order
NA	
A/0./8	non log ny log log ny goot (n) rog(n!)
	$n\log n$, 2 , 2 , 1 , 1 , 1 , 1 , 1 , 1 , 1 , 1
Ang 8	$ \omega = \log (\log n) \leq \log n \leq \log^2 n \leq \ln \ln \ln \log n$ $\leq n \log n \leq \log^{2n} \leq n^2 = 2^n \leq 4^4 \leq 2^{2n} \leq n$
. ,	$ ooe log (logn) < log n < log^2 n < \sqrt{n} < n < logn)$ $< n log n < log^2 n < n^2 = 2^n < 4^4 < 2^{2n} < n$
	Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q