	NAME -> PRAKRITI RAWAT
	SECTION -> CST SPL 1
	ROLL NO → 11 Date
	TI)TD0101 - 0
	TUTORIAL-2
1)	usid fun (int n)
	int $j=1$ , $i=0$ ; while $li < n$ ) $di = i+j$ ;
	while (ian)
	dizitj;
	1++;
	pt time > i=1 2nd time > i=1+2
	2nd time > i = 1+2
	i
	jor ith time > i= (1+2+3+i) < n
	$\Rightarrow i(i+1) < n$
	2
	) i ZAN
	$i = \sqrt{n}$
	yo landonituz O(Tr)
	Jime Complexity = O(In)

	Date
2)	int lib (int n)
	J. O
	$i \in (n < 1)$
	vieturn no
	2 vetwer jib(n-1) + jib(n-2);
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Recuvience Relation
,	f(n) = f(n-1) + f(n-2)
	de et effektive vetanten et
	Let Tim denote time complexity of Fin):
	· For not 120 mot
	T(0) = T( 0) (1) - (1)
	$T(n) = T(n-1) + T(n-2) + \bot$
	For n=0 2 n=1, no addition occurs i. T(0) = T(1) = 0
	2 in (1) 2 1990 1990 (1) 2 1990 1990 1990 1990 1990 1990 1990 19
	+ T(n) = 2 x = T(n-1) +1
· · ·	
	Using backward substitutions
	T(n-1) = 2x T(n-2) + 1
	T(n) = 2x [2x T(n-2) +1] +1
	= 47(n-2) + 3
	we can substitute
	$T(n-2) = 2 \times T(n-3) + 1$
	> T(n) = 8 x T(n-3) + 7.
	Creneral Equation:
	Cheneral Equation: $T(n) = 2^K \times T(n-K) + (2^K - 1)$ —(3)
	10~7 (0) n-K=0 =) K=n
	n-K=0 =) K=n

ı

		5
	Date	
	substituting values in (3)	
	$T(n) = 2^{n} \times T(0) + 2^{n} - 1$	
	= 2n + 2n - 1	
	$T(n) = O(2^n)$	
	Space Comprexity > O(N)	-
	with the same of	
	Realon:	N
	Function calle aux executed scientif. sequentia	lly
	sequential execution quarantees that stack	
	size will never exced the depth of celle.	
	V	-
3)	O (n (logn))	200
		-
	// Merge Sort	-
		*
	#include Riostream>	2
	ueing nancespace std;	Ÿ
		2
	void murge lint * away, intl. intm. intr	)
	d inti, j, K, nl, ner;	
	nl = m-l+1; nr= r-m;	
	int larr [ne]; Haw [ner];	
	Inx(1;=0: (<01: (++)	
	or(i=0; i <nl; d="" i++)="" low[i]="ownay(2++];" td=""  ="" }<=""><td></td></nl;>	
	1 11 2 2 11 2 2 1 1 1 1	
-	lor (j=0; jknr, j++)	
	ravicij = avaycm+1+j];	
	i=0; j=0; K=2;	

Date while (it he 22 jt har)

i) (lower Ci] t = lower Cj])

ld ownay [k] = lower Ci];

i++; } else d away [k] = raw [j]; j++; } void merge\_sort (int \*awray, int lo intr)

d int m;

i) (l < r )

d int m= l+ (r-l)/2; morge\_sort (away, 1,m); morge-sort (averay, m+1, v);
morge(averay, l, m, v); 0 (N3) int main () d int n=10; for (int j=0; ixn; c++) d

for (int j=0; jxn; j++) d

for (int K=0; Kxn; K++)d

cout < "Hey"; 3 7 6

	Date
O (wg (wgn))	
	•
int countprimes (int n) of	1
il (UK2) meturn 0;	
boolean [] nonprime = new boole	or [u];
nonprime [1]: true;	
int numnonprime = 1;	9
jor (int i=2; ixn; i++) d	1
if (nonprime Ci D) continue;	7
	. ** * *
int $j=i \times 2$ ;	
while (jKn) of	
il (! nonprime Cj]) of	*
nonprime [j] = true;	
numnonprime ++;	
A COMPANY OF THE REPORT OF THE PROPERTY OF	
1+=(;	3
2	
	* 1
	- C
. `	William Bal
	. N

- 19

A Company of The State of

9

Date T(n) = T(n/H) + T(n/2) + x2 4) Using Masterie Theorem, T(n) <= 2T(n/2) + (n2  $\Rightarrow$  T(n)  $\angle = O(n^2)$ =)  $T(N) = O(n^2)$ ALLO, TUN) > = (n2) > TUN) > = 0 U2)  $T(n) = O(n^2)$ 5) for i=1 > j= 1,2,3, --- n for i=2 -> j = 1,3,5 ----T(n) = n + n | 2 + n | 3 + - - -= 1 (1+112+118+--) -> O(nlogn)

Date		
Date		

6) for jour iteration  $i=2^{n}$ 2 rol iteration  $i=2^{n}$ 3 rol iteration  $i=(2^{n})^{n}$ :

nth iteration i = 2 k = n
using logarithm;

iz log k (logh)

\* \*

1