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Here time complexity -

for linear search is O(n)
for Inner loop is O(logn)
for outer loop is O(n)

Thus by adding all the time complexity

: Time complexity is O(nelogn).

	- 10
	Solution 2
	Recursive function for Binary Search
	Cut in state of the contract o
	Int Binary Search (int [] A, int low, int high; int x)
	E - Constitution of the State o
	il (low 7 high) {
	netwn-1; } spots + celon t = cont
	int mid=(low+high)/2;
	$ij (x = A[mid]) {$
	getum mid; ?
	el x 0 i 1 (X < A (mid. 1) ?
	return Binary Search (A, low, Mid-1, x);}
	else {
	return Binary Search (A, mid+1, high, x);}
	}
1	24 34 42 210 34 1 = 05 12
	Suppose lue have a total time T(n), In recursive
1	Binary search our trend is going half like n -
	m12-1 n14 - n18
	·: Recurrence relation - T(n) = T(n/2) + c
	DX+1 = 10 17
	By backward Substitution method
	Constitution = carr
	we have recurrence relation
	$T(n) = T(n 2) + C \qquad \qquad \boxed{1}$
	$T(n/2) = T(n/4) + C \rightarrow for n = n/2 \rightarrow \emptyset$
-	T(n/4)= T(n/8)+C -1 for n=n/43

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Substituting eq (3) in eq(1)
$T(n) = T(n y) + c + c - \omega$
Cathing Blain and the State of the Agreement left a
Substituting eq 3 in eq 4
Mant de ament la lace de lace de la lace de lace
T(n) = T(n/8) + C + C + C + C + C + C + C + C + C +
T(n) = T(n(2) + 3C)
And the second of the second o
Similarly of we go for kno of steps
Jakimi A ve tyligale
T(n) = T(n/2k) + kC
7909
To terminate this function we know that T(1)=1
V
in = 1 i.e n=2k ie k=logn.
dk hafter taking
log on both
T(n) = T(n) + kc sides
5 + (state of T(n) = T(1) + kc
T(n) = 1 + kC
to to T(n) = 1+ logne
$T(n) = O(\log_2 n)$
Cario de parentante auch aus de la companie de la c
Strong to the st
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	Solution-03	
346	Recursine program for linear Search	mac4
	The same applicable to the same designation of	
	# include Kiosteleam>	
	using namespace Std;	
	using namespace Std; int Seauch (int avu[], int Size, int key)-	
	{	Ajacolli
	int Jemp;	
	Size; Of (Size, >=0)	
	d (sine, 7=0) = = = = = = = = = = = = = = = = = =	
	(B) - 14(B-ys) = (2-4)	
	g (ang (size) == Key)	
	return size;	> Recursive
	else de de la	function
	Jemp = Search (avv, size, key)	for linear
	Employed standard which are an	Search.
	else	404
	return -1;	
	Heturn Jemp;	
100000	3	
	int main (uoid) {	
	int our[]= {12,34,09,58,6}	
	int size = size of canol / size of ann [0];	
	ent key=3;	art .
	int Index;	
	Indeac = elen Search (aur, size, key):	
	if (9ndex !=-1)	or and a second
	Cout " " " Clement" " Key K" is present at inde	a" «indea « endl;
	else	
	cout « " everment" « key « is not poverent »	ende;
ON ROLL	Meturn 0: }	

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	Solution CS
	Now, as we know, recurrence relation for the
	linear search recursive algorithm is
	and the second of the second o
100	T(n)= T(n-1)+C that many many many
	refine and the Charles about the
	using backward Substitution
	Jacob China
	T(n)= T(n-1)+C - 1.
	T(n-1) = T(n-2) + C - 2
	T(n-2) = T(n-3) + C - 3
	And = Deline And I have
STAR	miles in a series of the serie
audo	T(n-i) = T(n(i+1)) + C - Q
annil "	red (manifesta north roman) a good
Talled.	Now we back substitute the equation.
	we get
	T(n) = T(n-2) + 2C
	T(n) = T(n-3) + 3C
	Chian coince to
	T(n) = T(n-i) + i & (5)
	as we know T(1)=i
	then n-i=1
	h-1=i month to the
	[i=n-1] puttingualue in lig.
	we get
(1° 77 1° 1)	T(n) = 1 + (n-1)c
	T(n)=1+(nc-c)
	T(n) = nc-c+1 100 = 100 100
	T(n) = O(nc-c+1) $T(n) = O(n)$ as constant be eleminated.
	amiraca.

```
solution 04
# include (iOstream)
Using namespace std;
int Binary-Search (int AT), int low, inthigh, int key)
    while (Low (= high)
     int mid=(low+high)12;
if (Almid]<key)
      low = mid +1;
     clse if (A[mid]> key)
     high=mid-1;
    else
    Hoturn mid +1;
int main ()
int ACT = { 20, 30, 45, 77, 89, 90, 94, 99, 100, 150};

Cout K" Enter the key:";
 cin'r key;
```

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	tio and side
	Cout & Binary Search (A, low, high, key);
	netumo;
	3
Long Fall	L. doubter was true I I Vand war are mineral time
	(i) linter the key: 10
	(ii) Enter the key: 152
	-1 tell inti-ward share from
	(iii) Einter the key: 45
7 /	3
	(iv) enter the key: 89
	5
	(proteins) 1 (1 gal)
	Best Case: The best case of bimary search occurs when the element or value which we need to find is present at the
	element or value which we need to find is present at the
	middle In this case the best case will be avrise when
	key=90
	A verage case: Average case lies in blu most case and best
	case it is the key element can be found in less the word
	iteration but greater than best case iteration.
	In this case Average case arrive when key=770r99.
	work case: In this it takes maximum iteration or time
	this happens when element is found after all niterations
	3n this coast the worst case avoisse when key = 39.
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-	and yet with the second