assignment Date. 1918029 Ishika Jain Page No. 1 What do you mean by Asymptotic notations. Define different asymptotic notation with examples. Asymptotic notations are methods assing which we can define suring time of the algorithm based on the input size b.) Big-O: It is for the worst case or the ceiling of growth for a given function ex. $f(n)=3\log n+100$, $g(n)=\log n$.

Big- Ω : It is for the best case or a gloor growth eats for a given function. iii-) Small -0: - It is used to denote upper bound on the growth rate of suntime of algo Small-Omega: It is used to denote dove bound on the growth rate of surtime of algo. Theta: It is used to denote the asymp-statically stight bound on growth rate of runtine of an algorithm.

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(2) What is TC of:

yor (i=1 ton) i = 1.2k-1 i = 1.2

T(n-1) = 3T(n-2) T(n) = 3(3T(n-2)) = 9T(n-2)T(n-2) = 3T(n-3)

T(n) = 27 + T(n-3)= 307 (pek) $3^n + (n-n)$ = 307

 $= 3^n + (0)$

TC= 3"

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6.3	TC? void function (int n) Sint is count=0; for (i=1; i*i<=n;i+4)
er gegen betreuten der det treinen der der den den den der den den der den den den der den den den den den den Der den der mellingsgebilde der den	Court + + ;
	TC? your function (int n)
	$\frac{\sin i}{\sin (i+1)} \frac{1}{\sin (i+1)} \frac{1}{\sin (i+1)} \frac{1}{\sin (i+1)} \frac{1}{\sin (i+1)} \frac{1}{\sin (i+1)}$
	80 (K=1, K<-0, K=K*2)
	n dogn dogn

21)	Complexity of all conting. discussed in class. algorithm name	algo that has been Time Complicity T(2) +1
	Binary Search using Recurrence Relation	
	Lineau Slauch	Worst case: O(n) Best case: O(1) Aug. case O(n)
	Streetie Binary, Search	Best Case: O(1) Worst case: O(n) Aug. case O(n)
	Recuire Biray Search	Best case: O(1) Aug. case: O(logn) Wosistcan: O(logn)

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Name of the same o	
(23)	Write Recursive / Strative pseudo code for binary Search. What is TC & & C. of derivant of binary Search (Recursive of iterative) Recursive:
	Sirary Search. What is 10 230 of
TO RECEIVE THE THE PARTY OF THE	deriear of binary Search (Recurre of iterative
	Recurice:
energy coast interest interest in the control of th	int &s(int al] intel, int 2, ent 2)
n de conventinado meió de de como de conferio de proposicio de la composició de la composic	Recurrice: int &s(int at], int x, int x) int &s(int at], int x, int x) int wid = (1+x)/2; Best can = O(1) int mid = (1+x)/2; Woost can = O(legn) if (at mid) = x) Avg can = O(legn)
an de la care de sendro perdro se an excusión de acomo hombre	int mid= (l+2)/2) What care= O(legn)
- model free has half employed a designal recovered a conscious by the half	if (at mid] == x) Avg case = O(logn
- Some sub-charge and displacement and recognision in contrast.	setup mid;
The second party backward and a second secon	else ist (atmed 7 > x)
	if (af mid] == x) wost can = O(logn) setur mid; else if (atmid] > x) setur & bs (a, l, mid-1, x);
	else setur los (a, med+1, 2, x);
	Austrie: int Oslint al 7, int l, int 2, int 2) { while (l<=r) { while (l<=r)
(:u)	Austrie:
	$\frac{1}{\sqrt{1+\frac{1}{2}}} \frac{\sqrt{1+\frac{1}{2}}}{\sqrt{1+\frac{1}{2}}} \frac{\sqrt{1+\frac{1}{2}}}{\sqrt{1+\frac{1}{2}}}} \frac{\sqrt{1+\frac{1}{2}}$
· · · · · · · · · · · · · · · · · · ·	7 sone (ac s)/2:
A company to the contract of t	if (at mid] = = x) setus mid;
	of (al med I < n) d= m+1;
The second secon	of (atmedJ <n) l="m+1;</th"></n)>
96.53.7.2.3.4.	else a= m=1; Best com
Annual construction of the	3 return -1; Worst care of logn
	3 Aug cone = O (logn)
A very construction and property of the construction of the constr	
	15일 하는 15 The Petrope (14 1) 15 The Petrope

24	Write Recurerce relation for Ginary Recursive
	Coach.
	$T(C) = T\left(\frac{n}{2}\right) + 1$
	T(1) = 1
=	T(n) = T(n) + 10, $T(1) = 1$
	putting n = n in eq 1
	$\frac{T(n)}{2} = T(n) + 1 - \mathbb{D}$
	pulting value of T(2) of eq. (1) in eq. (1)
	$T(n) = T(\frac{n}{4}) + 1 + 1 - ID$
	putting 1=1/4 an equ,
	putting $n = n/y$ in eq. \mathbb{D} , $T(n) = T(n) + 1 - \mathbb{D}$
1	
	putting value of T(n/4) of eq(10) is eq (18)
	T(n) = T(n) + 3
	$T(n) = T\left(\frac{n}{2^k}\right) + k$
	(2^k)

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