	(3 (2)	· · · · · · · · · · · · · · · · · · ·
_	> Randonizad Al	11 11 11 11 1 1 1 1 1 1 1 1 1 1 1 1 1
	Randonized Algorithms	Anartized Analysis
	(a) ((ga) -> Rondonized analy Coul	<i>i</i> =
	- Marke Carly - min count	
_		y wanter
-	- Quick Sort	Potential Analysis
	A che et un	
	Quick sont and	to property solo
	Quick Sort (int 1, int x) }	fortition (intl. int x) {
	if (l < x) {	CLIA = seria
	p= partition (2, x).	1501 (2) (2)
.?	Quicksorte (Supp W. w.	de la course (i < j) {
	Quick Sort (pet, m).	
	3 9 cmi	do {
	5	1114
· N		(toviq [I]A) slubar ?
	· Rest Cove : She about	3 cm
,	· Best case: The privat is always in	1
,	the middle,	3 while (A[i] pivot):
	N Oceth = logn	if (i > i)
•	with with with the o (w rodu)	
2	o Cu cogn)	3 swap (AG), AGI).
	· Worst case :- If already sorted	
	(choosing A (5) in according)	swap (ACL), ACC);
1	expth= n	netwa j.
	Fach level = n	3
	o (Nr)	
	1 to 1 1	
	· Rondonized Phrot -> Never worst care	
-	Always o (n logn)	. 740

-	· Dynamic Dua	and the second	<u> </u>	1		
	· We kee	ep doubling	size of own	y to accomodo	the more elements,	(a) : ·
			Size	Cord		41
	Time Shine But	10 10 mus	WWW NO	refor A) west	14.1K	
		1		· 000 49 AD	giorit.	
		10 20	2 1 3m.	grade their or	. 204 - 4.3	
		7			92 dest	
	1.	0 20 30	4	241,	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
	•	• 1			,,	
Q*V	7474	0 20 30 4	\$ 1/2 /L, ()	19 = Week	August 181	
89	lodge 1 milit	b . a. ((3) , 2011			
	10 20	30 40 50	8	4+1		
			£	3' to your	ach element	
	* Asympto	Heally, Pries	ution takes	O(a) time o	s every ten de	ration
we need to copy the ostroy.						
however realistically there are more elements					elements taking a	(6)
time than tolding O(n) time. Thus, we need to to						nacide
	# For 10	d enothropy;	ere, the cost	(8)		
	· · · · · · · · · · · · · · · · · · ·	1+3+1+3141	1984149	= 25 / 64	Imblotic moning as Ti	<u>o)</u>
	eta igi dani si	19 401,10	MY WOOT -	TIEN GRIS	imptotic would be ju	
	3/9 3/26 -04	Amortized !	Lualysis (Aggr	egate) :	1 'u'	
	a 60	verally, we	name !	Figur Bur	= N+(8N-1) = Q	
. 4	1. 1	a attend	-) A (1+2	+50+ -2001) =	= n+(2n-1) = Q	7)
	-3417.00	14 25111035	tor Valuear	v raci w	, ^	
-				int man in		
	e Uzes mond	on humbers	(or) dissinces	to decide to	he next step (07) li	spic
	· · · Possible b	o reduce t	one and s	pare complexi	ty,	
	Las Ve	gas (A, n, x)	Story - west	- ATTIEN TO AND T	100 H 2 MI 0	
	West in the	wie (true) ?	क्षा च व्यक्ति व	navilianie ie	* Trevition	itaux!
	2 m (4 h m 2 m 20 f m	undiner select	In element	out of m' eteme	inte can be a	
		if concile to	rund)	took of stooks	in a large.	
· vote	••	neturn	true ?	. 1' , ,	* Always	gives
	3	7	, 1	n o c	coved	anstra
	- 1 Land					

	Honke Could (A, N, N) {	3 %
	120, pag = false	y the state of the
•	white (i <=n) {	
2	randomly select on element out of 'n' elements	* Iterations (runting
	worth the man to the way the Part	is fixed.
2. 7r.y. 11 3	if (n is found)	* May or may not
	flag = true	give and onwer.
	3	<i>p</i> *
	2.	
	Delivered Anick Sort Comes out to	
	Rodmized Duick Sut	
	If we choose It as plust,	
	of the same	
	10 531 15 16 18 20	
	Here, 3 is only compared with @ and	3 not everything else.
	Time complexity Analysis (Rondom indicator variable)	
	Xij = I sither 0 or) 1	
	* If 7: is compared to Z; then Kij=1	21, Z) are simply two numbers
	If they are not compared, then Xij=0	[simply two numbers]
		-
	For example, in selection sort, we home	Line House Ho Line
	For example, in selection sort, we have $\sum_{i=1}^{\infty} \sum_{j=i+1}^{\infty} X_{ij}$ (as time complexity)	win of bot then carl I
	िटा हेटोमा	
	Here, for rondonized quide sort, we need to find the	expected time complexity
	E[N] = E[\frac{1}{2} \frac{1}{2} \text{Yij}] = \frac{2}{5} \frac{2}{5} \text{E[Xij]}	
	المراج ال	:
	$=\sum_{i=1}^{\infty}\sum_{j=1}^{\infty}P_{ij}$	is Audiability of comparing
	ि। विस्ति	
	(i-i+1) elements	
	We have, (j-i+1) elements	
	(1-1) elements (N-j) elements	
	[(-() 8000B (N-3) COM(N-3)	

	touis		
*24	we choose from sect	in II, (Z; Zi)	will mot be compared
			× 1
	=> examplities	= D	not taking alm as we are
Ligar Verse	· * * there is	to esta processo or	not taking 21m as we are taking 2 for all (ivi)
	T T without mis	is will not h	are other suitable plats
	2 £ (2/j-in	1)	
· France in			
	A		
	27 we let k=((-()/	
	\sum_{1=1} \sum_{k=1} (2/k)	(()	347
	0.5		
	2 2 121.	H). (\(\hat{\Sigma} \frac{\Sigma}{\Sigma} \	11.
	2 2 (TK	(H) . 2 2 ((1(c) · · · · · · · · · · · · · · · · · · ·
			District 1
		< Ellign)
and the same	2 5 . 4	< 0 (n log	N) 6 304