	DATA STRUCTURE	CHEMEN	A soft			
	- A relation of data that is characterized	d by the	operations			
	used to access & satisfy the data		directs			
KOAN	45 Data Structures:	Sheed be	Transfer Land			
	4> Arrays a Venctor		Ac equided			
	4) Dynamic Arrays -> Array Lists	Will be				
	15 Dynamic Arrays >> Array Lists 15 Linked List >> List 15 Stack					
	4) Stack	14-6,76	World How			
	4 Quene	(10				
	Thio SORTING ALGORITHMS	- Not	in place			
	Two SORTING ALGORITHMS Not in place  -Insertion Sort - Merge Sort -					
in place.	-REQ: General use etc. characteristics - NOT CODING A					
The call a	the transportation of a postular of the	mus mal	a g + word			
	ALGORITHM EFFICIENCY					
To also	-Time -Space (memory)					
	Will talk about time efficiency 99% of this semester					
	Space Arri	ay a	Busble			
	Space Arm - In Place		2 sort			
Either	4 Constant number of temp values	1 10				
1971	- 5 Do not use (really) any exotra mem.		Merge			
24500	- Not in Place		D   Sort			
- Not in Place DODDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD						
		port: reorga	nizes inside larray			
	Merge Sort: Creates multiple arrays to sort					
	TIME EFFICIENCY	1	my shall had shad			
0(n)	- 2 ways of measuring efficiency		only			
2 "order",	45 "official mathematical way"	/	Lill be using			
factor that	4 in-practice by every coder & cs major this (O(n))					
relates to size						
orinput	- big-0 O(n) = Either an upper bound or tight bound (Notation) order I Factor that relates to size of input					

	TIME ÉFFICIENCY	(CONT.)		1130970 ATAG		
	Graph (not to scale) of common/important growth rates of					
	algorithms, ou	industrial of	ntogni"ntogni"	Exponential (		
	Time 1 (logn) "logn"					
	> O(1) Constant Time (REALLY GOOD)					
	small N (data size)					
	(who cares?)					
	santa ai Para		August Has	Appertice of T		
	Sanario					
Competitor	A fast computer 1 billion ips 2x theoretical - Godes Insertion sort					
lowself	B Slow computer 10 million ips 50x Theoretical - Clodes Mage Sort					
· warmasad.	Ardama Essiciency					
Dec.	* Choice of algorithm is Takes 2.3 days 20 mins of runtime				ins of	
	essential/important for of		of runtin	runtine		
	etticiency & insertion Sort - Exponential			mantial		
	Merge Fort O(nlogn) (exponential) = Can still be theoretically useful					
	Bubble Sort, Selection Sort, Insertion Sort O(n2) = Very Efficient For					
	LI DO PORTO			Small Collect		
	Looked at coole yay	COO C	in the specification	s early at		
	ioni excinages on their s	Miles .	(1,000)	81 544		
0(n2)	0(n)	O(logn)				
Bubble Sort	find min, find max	binary se	arch	Line Present		
election sort	linear search	<u>10,95,6</u> Y	the gas to many the	analy S-	[ (NO	
ania ania	and 1874		Las Tropica ton 1		1"xx/00"1	