Assignment No.09

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Date.

Title: Heap Sort

Arm: To implement heap Sost

problem statement: To implement heap sost to given set of values using min and man heap

Theony:

Heap is specialized three based datastructure which is an almost complete three that salts heap property. The heap is one maximally efficient implementations of an abstrationata type called priority queue in heap the highest for lowest priority element is always stored at root. However a heap is not sorted structure it can be regarded as partially ordered A heap is a useful dat structure cohen it is necessary to repetedly remove object with highest or lowest priority A common implementation of heap is binary heap in which the tree is binary tree.

proposty!

1) It's complete tree i.e all levels are completely

Filled except possibly the last level and the

lost level has all the keys (as left as possible)

2) A binary heap is either a min heap or a

mass heap

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	Man heap: The key present at 100 + 1100 e
	must be greater amoung the regs present
	Man heap: The key present at noot node must be greater amoung the keys present at all of its children.
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1	be minimum amound the keys present at
	be minimum amoung the keys present out all of its children.
	all of 18 annares.
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	Binary heap presentation:
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3.65/9.7	A binary heap is a sample binary tree typico Hy reprented as armay
	the root element will be at company to
	Index of node
	am[(2*i)+2] = right-child of node
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	ex No 100 per 1 on the contract hearth
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	Applications of heap data structure
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2	Selection Algorithm: finding the min, max both
	min & max median or even the Kth / Largest
j : -	element can be done in linear time using hops
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3)	Grouph Algorithm. By using heaps as intornal
	traversal data structure, verting coll be
	- hand by solvoumial ander:
	eg minimum spanning tree
	Djkstras shortest path problem
	o and a describer amon here is
	Por sorting in increasing order, max heap is used for sorting in descending order min
	used 1-or sorting in accomming or you
	heap is used
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	Validations!
	Limit validations
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\leftarrow	Test cases:
	a fact pringet
1	completely unsorted input partially sorted input
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	Conclusion!	
and	Heap Sort is comparison based Sorting tech	rique
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	constant that hear sort constant. In	_
	complexicity is of on (logn) in all three cases. Heap sost is more efficient that	<u>'e</u>
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