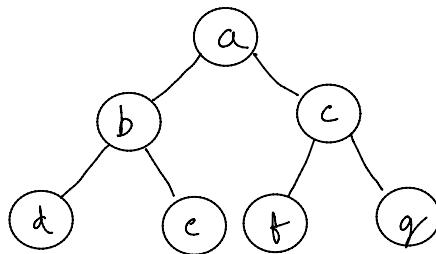


R-2.14 Is there a heap T storing seven distinct elements such that a preorder traversal of T yields the elements of T in sorted order? How about an inorder traversal? How about a postorder traversal?

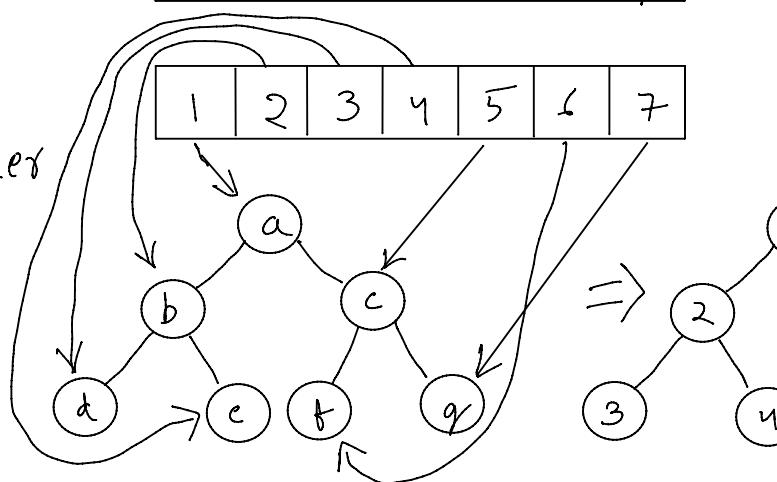
lets take input sequence 1, 2, 3, 4, 5, 6, 7



preorder
placeholder
expected
output
in sorted order

a	b	d	e	c	f	g
---	---	---	---	---	---	---

1	2	3	4	5	6	7
---	---	---	---	---	---	---



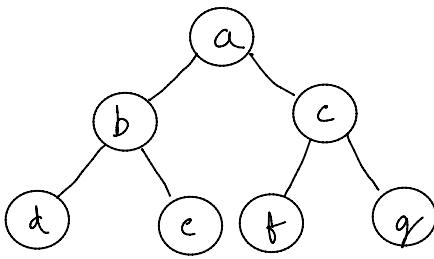
It is a
Min-heap

The input sequence to build above min-heap is

1, 2, 5, 3, 4, 6, 7

since heap is a complete binary tree we will
fill it level by level.

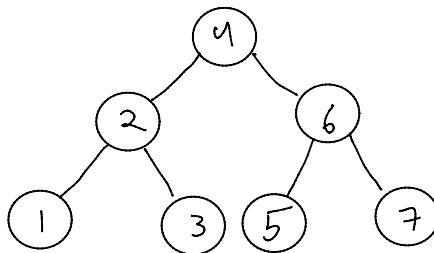
Therefore Yes, there is a heap T storing seven distinct elements such that a preorder traversal of T yields the elements of T in sorted order



In order
placeholder

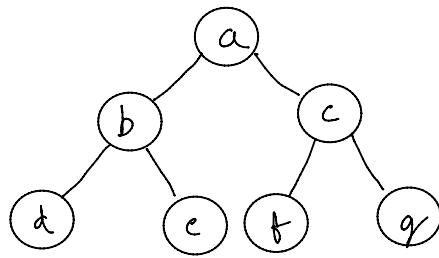
d	b	e	a	f	c	g
---	---	---	---	---	---	---

1	2	3	4	5	6	7
---	---	---	---	---	---	---



but not a
min-heap
nor a
max-heap

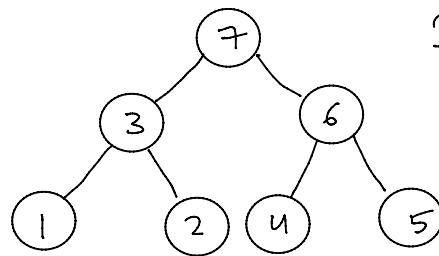
for inorder traversal root is always at middle of output sequence
in min-heap minimum is root and in output of inorder traversal it is at middle
in max-heap maximum will be at middle
in sorted sequence minimum should be at start & maximum at last for ascending viz-versa for descending
 \therefore Inorder can never yield sorted output of min-heap or max-heap



post order
placeholder

d	e	b	f	g	c	a
---	---	---	---	---	---	---

1	2	3	4	5	6	7
---	---	---	---	---	---	---



Its a Max-heap

Required input sequence would be

7, 3, 6, 1, 2, 4, 5

∴ Postorder can yield sorted output
of a heap

