Assignment - 1

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(1.) Insert the following values into an AVL Tree : 26, 34, 40, 29, 33, 32

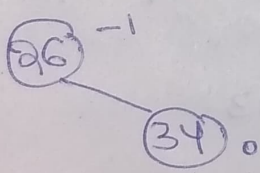
A Given,

values are: 26, 34, 40, 29, 33, 32

Step-1: Insert '26'

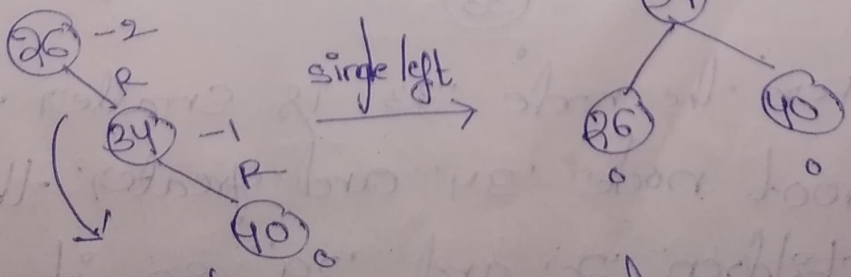
The balanced for this node is '0'.

Step-2: Insert '34'



following the pattern of insertion in binary search tree, 34 is greater than 26. So It is placed towards right of 26.

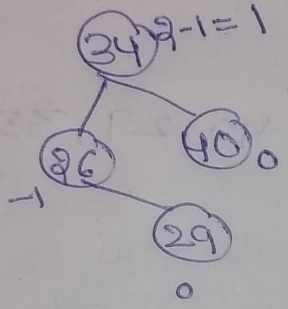
Step-3: insert '40'



As 40 is greater than 26 and 34 so placed

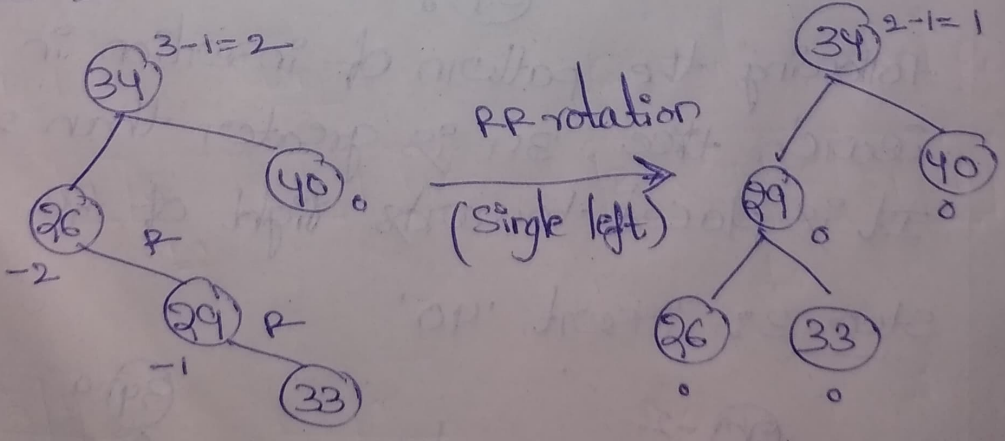
towards right and after placing the element the balance factor at node 26 is {-2} which is not acceptable so we have to perform suitable rotation. Here the rotation is RR rotation (single left rotation).

step-4: Insert '39'



Here the node '29' is smaller than '34' and greater than '26'. So it is inserted at the right child of '26'

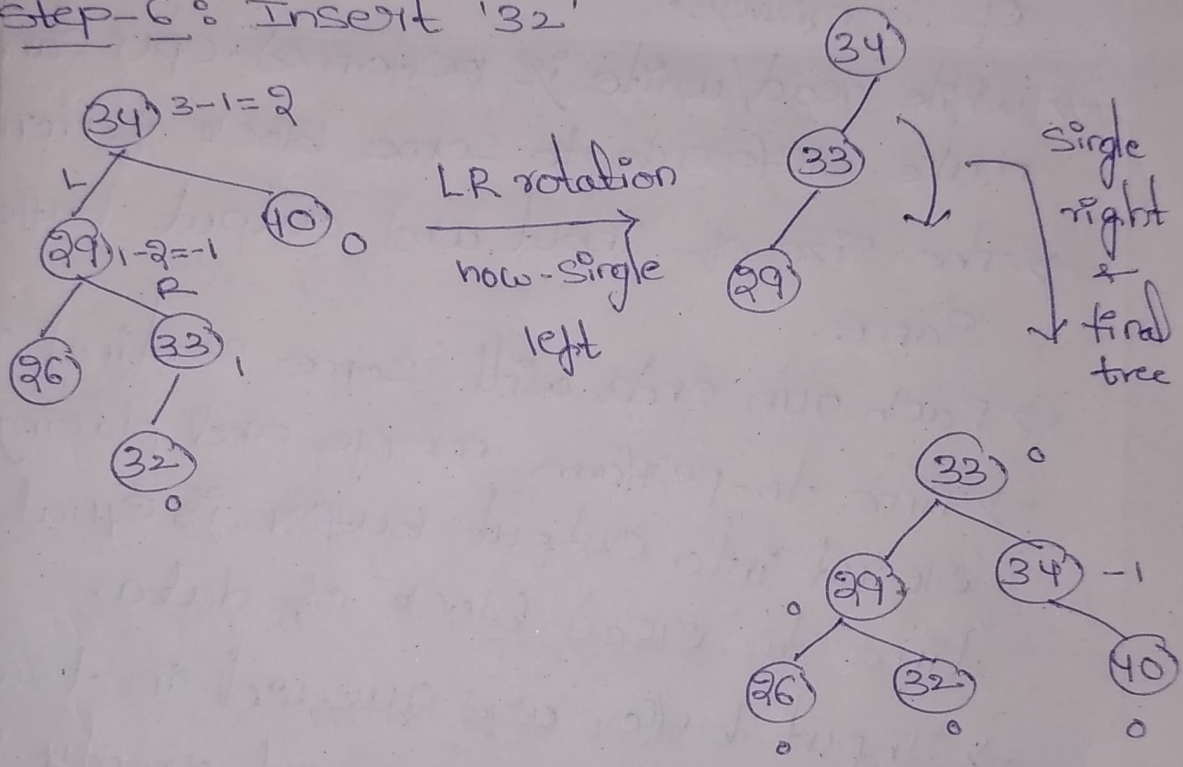
step-5: Insert '33'



Here the node '33' is smaller than the root node '34' and greater than it's children '26' and '29' so it is placed at the right child of '29'

After placing the element we are having a balance factor {-2} at node-26, inorder to balance it we have to perform RR-rotation.

step-6: Insert '32'



As 32 is smaller than 34, greater than 29 and smaller than 33. It is inserted to left of 33. The tree is imbalanced at 34 with balance factor '2'. So inorder to balance it we need to perform rotation. The rotation is LR rotation (single left then single right rotation).

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② Explain the details about Computing time for k-way merge sort with example.

A. In this algorithm only one input buffer assigned for each run where as the

remaining input buffers assigned priority based disk.

Assumptions:-

→ Read and write perform simultaneously with of 2 drives.

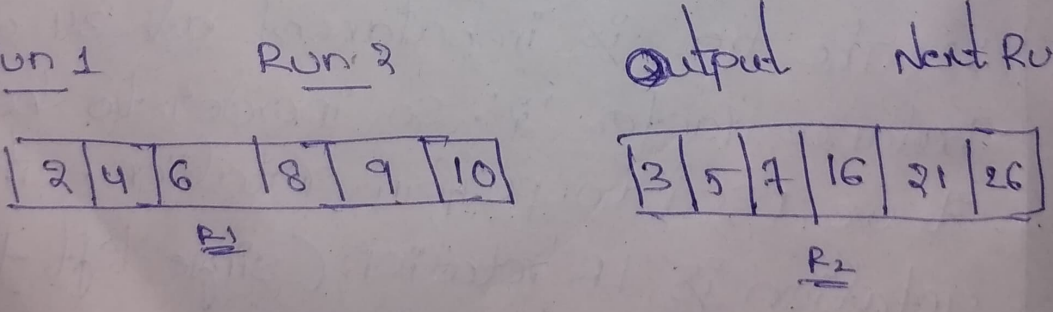
→ while read/write is performed. CPU cannot make reference to some block of memory.

→ The size of input and output buffer is same.

→ Each run ends with some sentinal record.

→ Time to perform merge and placing the result into output buffer is equal to time to read block of data.

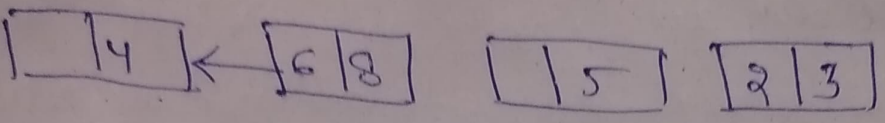
→ Input buffer are queued in t-Queue 1 Queue for each run and empty buffer are placed in stack.



1) 2 4 | 3 5 | No 1

N = Min (lastkey[1], lastkey[2])

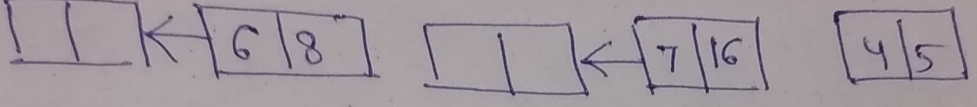
⇒ Min (4, 5) = 4 ∈ R1

2.) 

2

$= \min(\text{lastkey}[1], \text{lastkey}[2])$

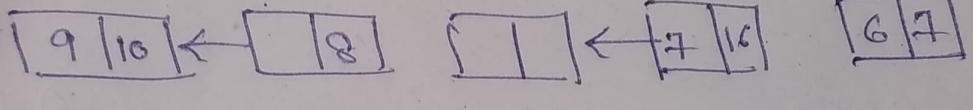
$= 8, 5 \rightarrow 5 \in R_2$

3.) 

1

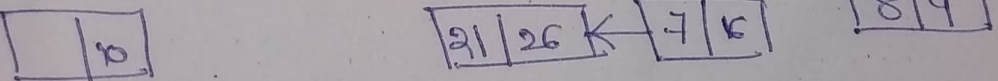
$= \min(\text{lastkey}[1], \text{lastkey}[2])$

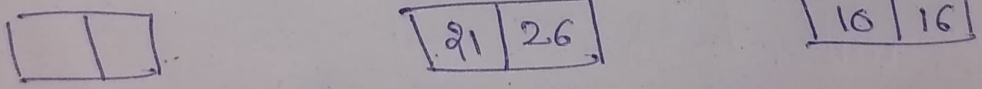
$= 8, 16) \rightarrow 8 \in R_1$

4.) 

1

$= \min(10, 16) \rightarrow 10 \in R_1$

5.) 

6.) 

7.)