Erkin Aydın ID: 22002956 Sec: 2

Question 1:

a) prefix: $\times \cup A\ B \cap \setminus C\ D\ E$

infix: $A \cup B \times C \setminus D \cap E$

postfix: $A\ B \cup C\ D \setminus E \cap \times$

b)

Insertion Part

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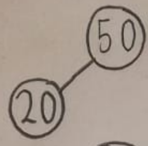
insert(20):



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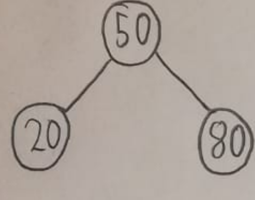

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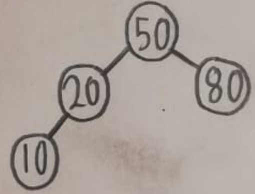

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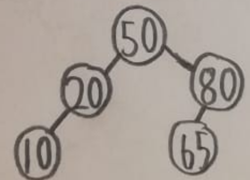

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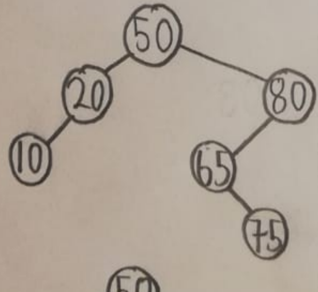

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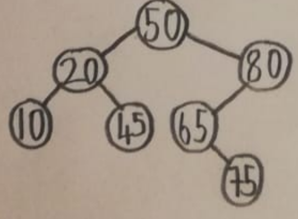

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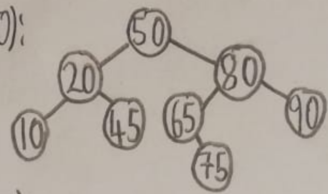

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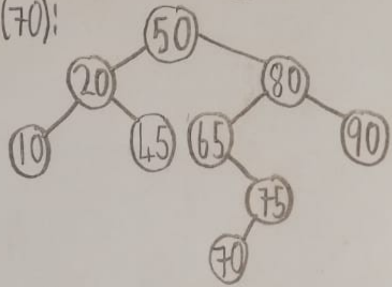

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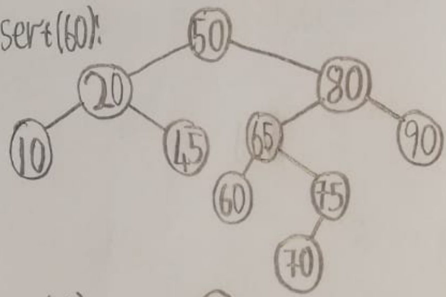

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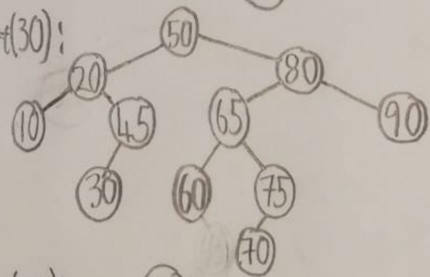

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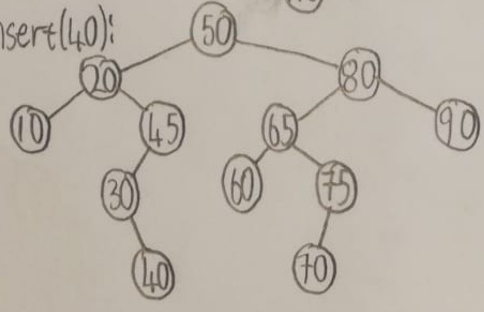

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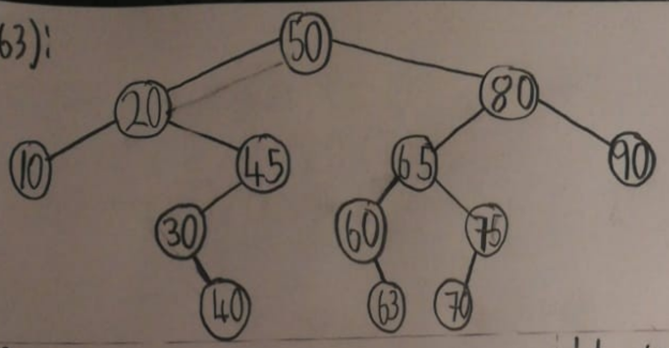
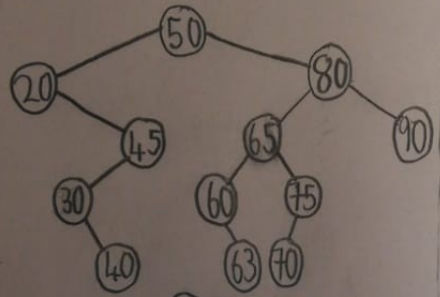


insertion part finished

Deletion Part

delete(10):



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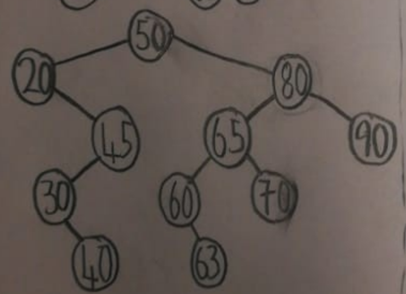

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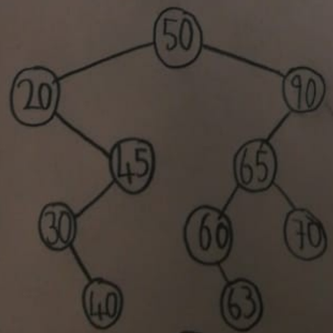

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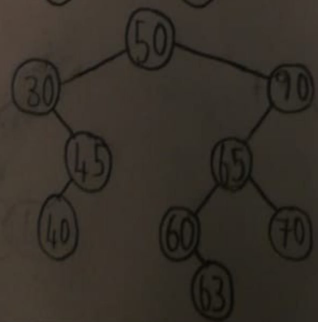

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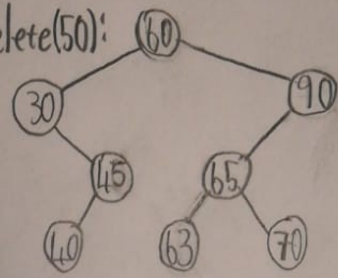
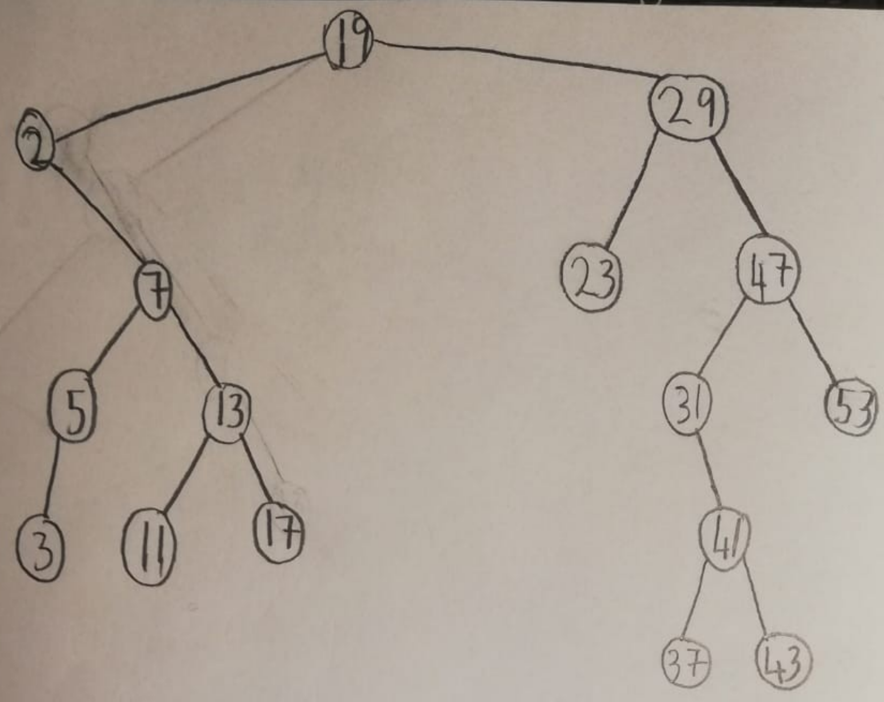


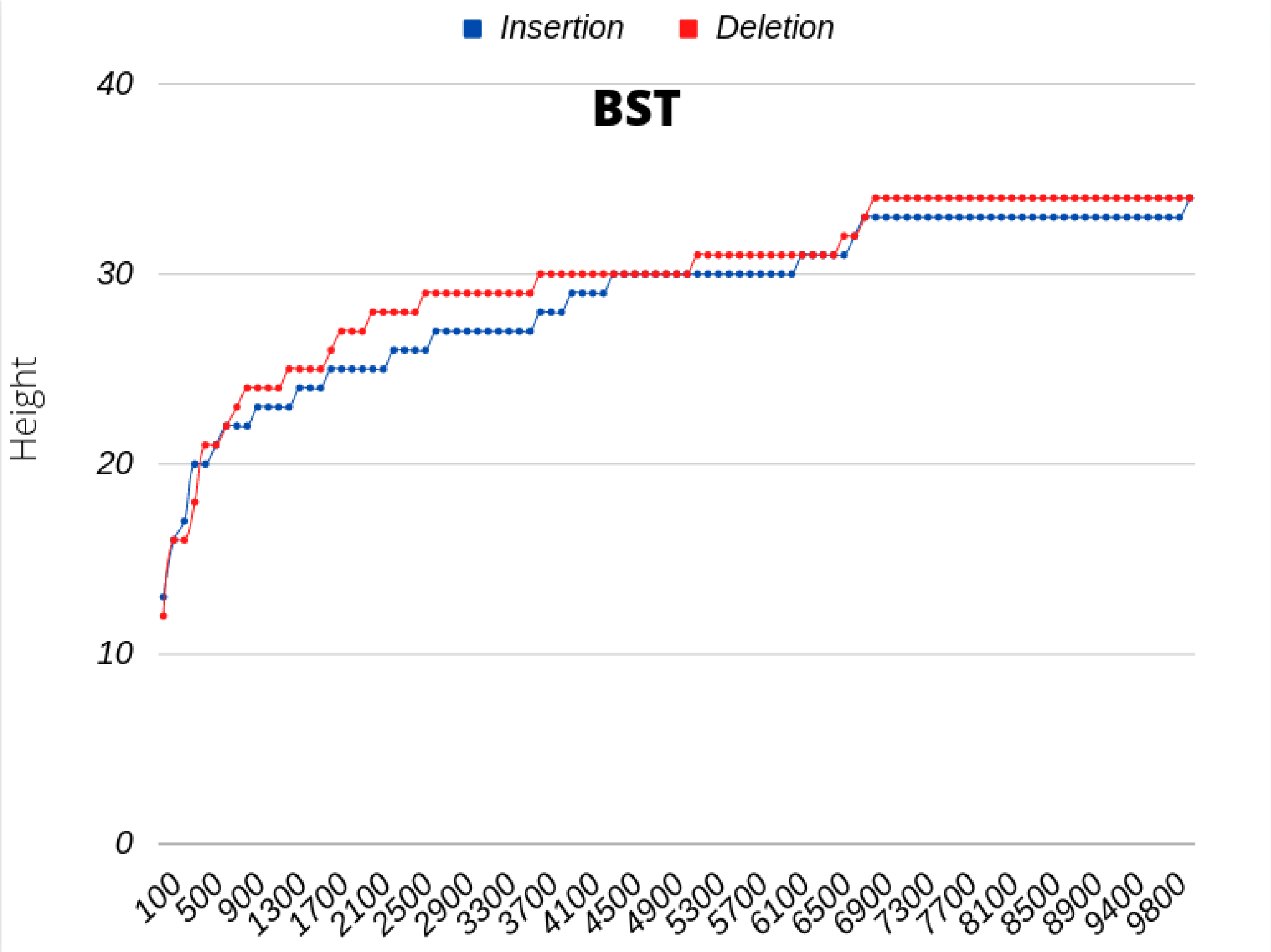
deletion part finished

c)



preorder: 19 2 7 5 3 13 11 17 29 23 47 31 41 37 43 53

Question 3:



Discussion:

Results indeed match with my expectation. We know that height is proportional to log(n), where n is the number of nodes, that is why it is natural for both plots to be logarithmic. Particularly at higher number of nodes, even if we delete a node, the ceiling of log(n), where n is the number of nodes, does not change as the node deleted is likely to be in the maximum possible level. The reason deletion graphic is a bit higher than insertion is because when we delete a node, we do not necessarily delete the node that provides the maximum height, that is, the height of the binary search tree.