9/8/21

SPLAY TREE

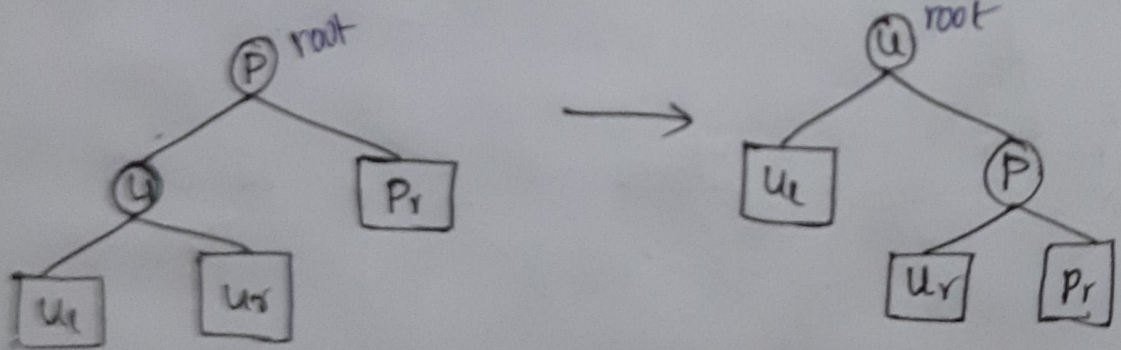
- Bind adjusting versions of AVL trees.
- amortized time for all operations is O(log n)
- worst case is O(n).

Operations

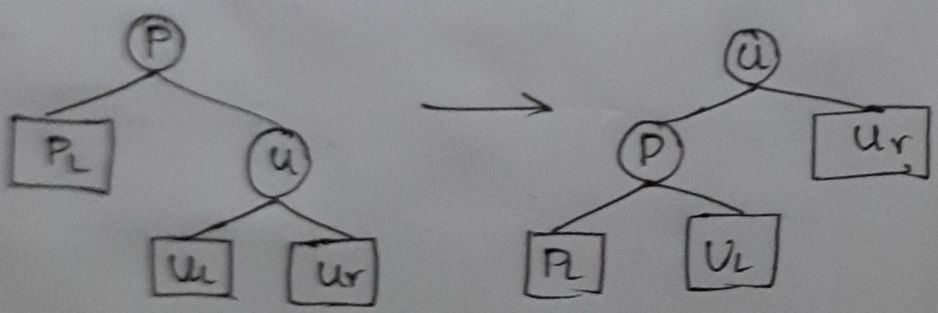
Search, Insertion, & Deletion.

ROTATIONS -

① Zig (L)
② Zag (R)
③ Zig-Zig
④ Zag-Zag
⑤ Zig-Zag
⑥ Zag-Zig.
⑦ Zig - (left).



⑧ Zag - (Right)



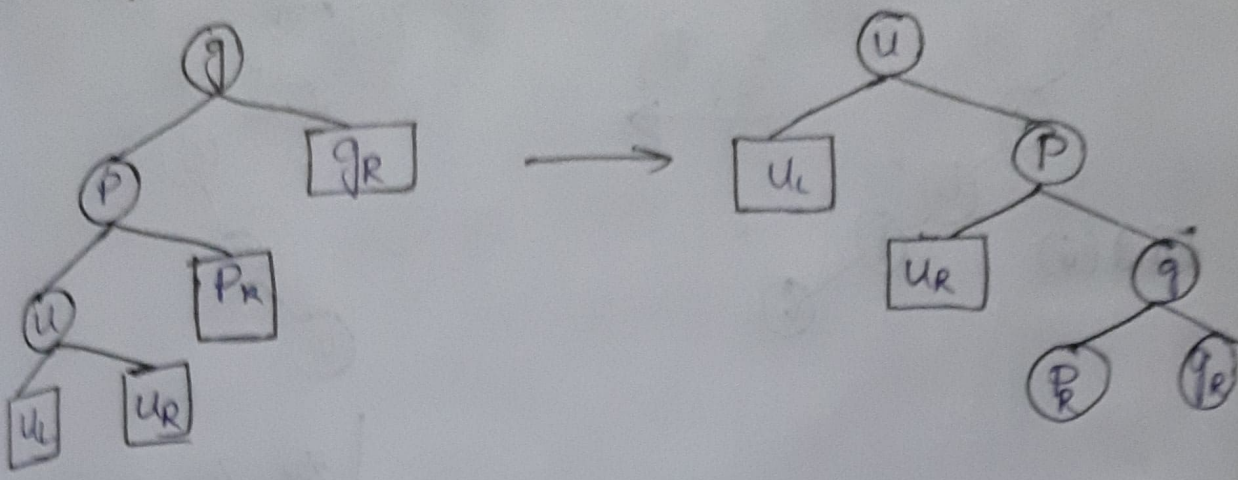
NOTE -

u - node on which splay operation is performed

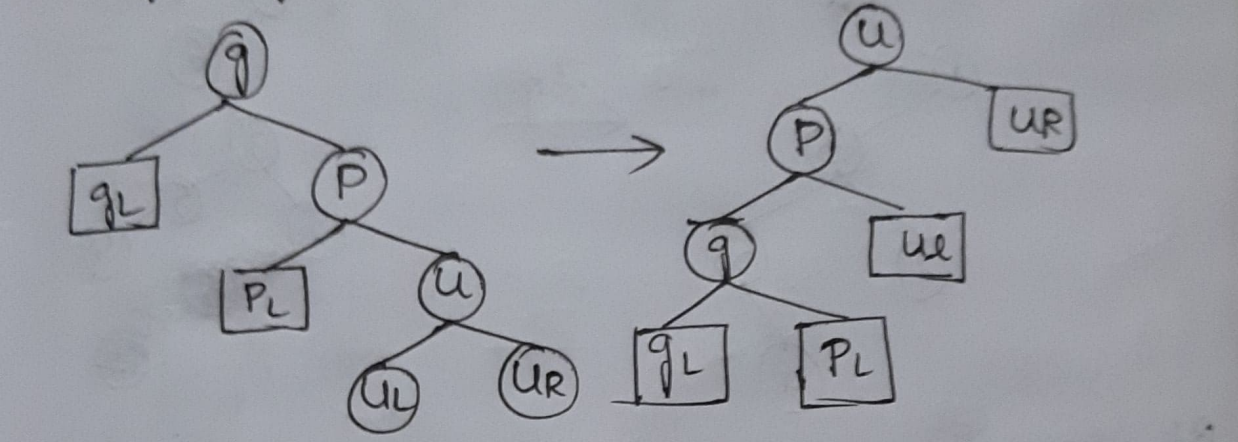
P - parent

g - grandparent.

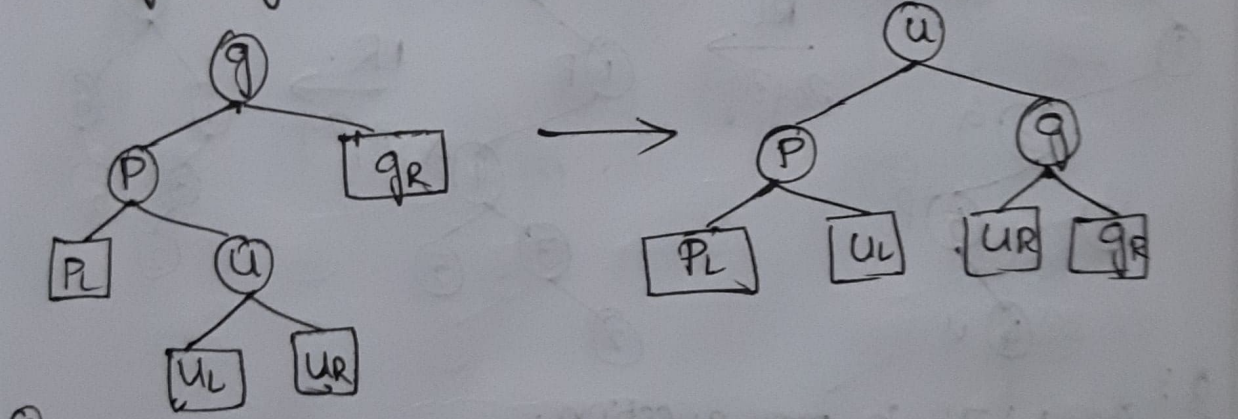
③ Zig-Zig - (LL on u)



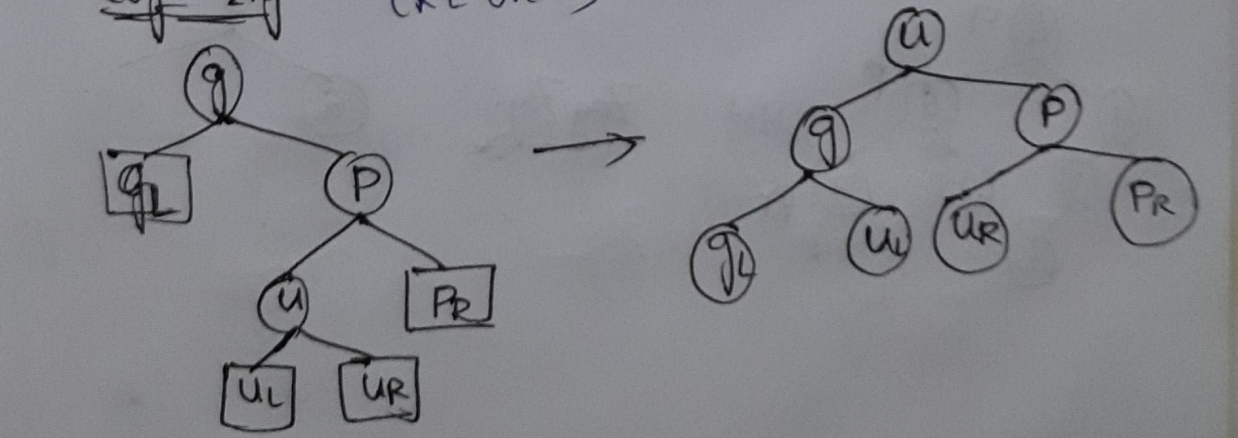
④ Zag - Zag - (RR on u)

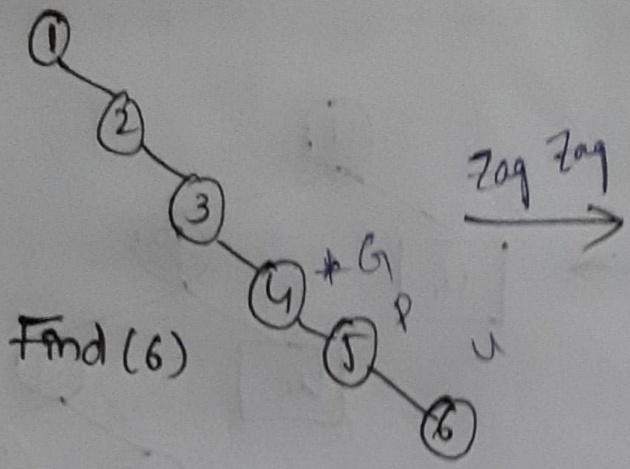


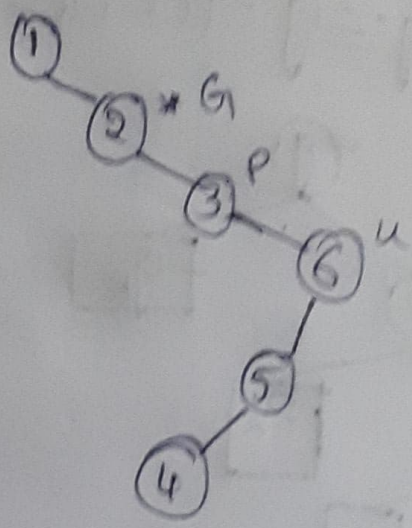
⑤ Zig - Zag - (LR on u)



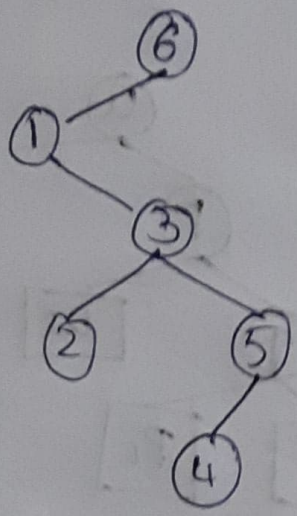
⑥ Zag - Zig - (RL on u)



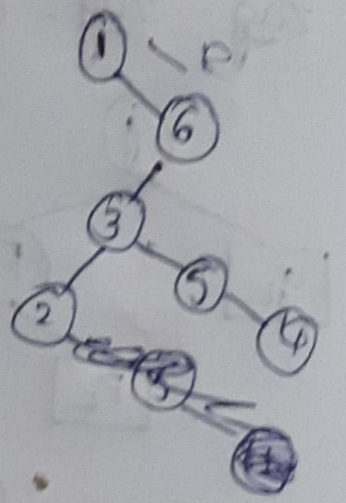




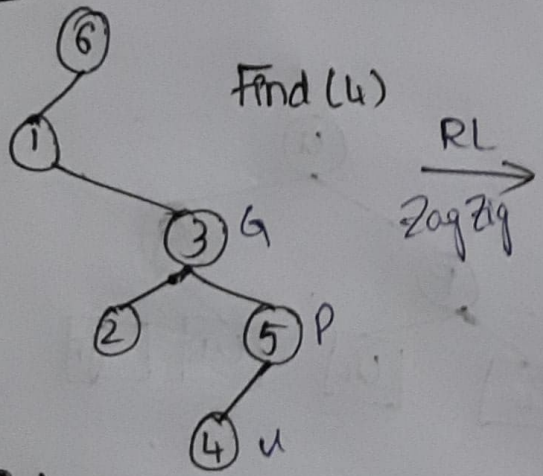
Zag - Zag on ②



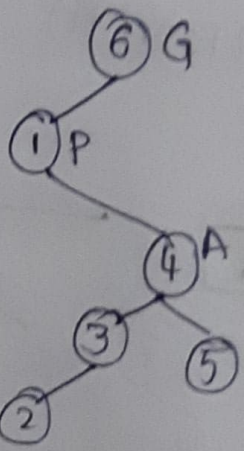
Zag



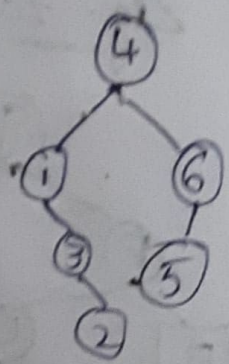
Q:-



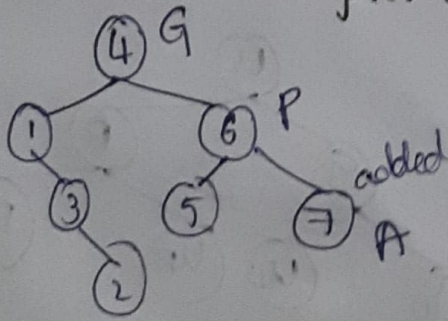
RL
Zag Zag



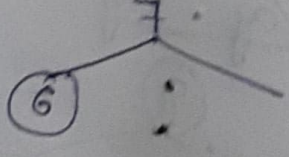
LR.
Zig Zag



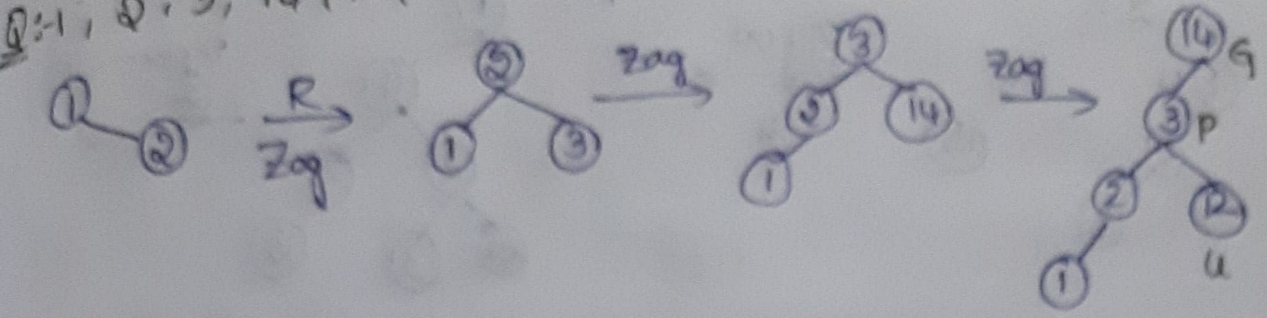
Q:- Insert '7' in prev question.

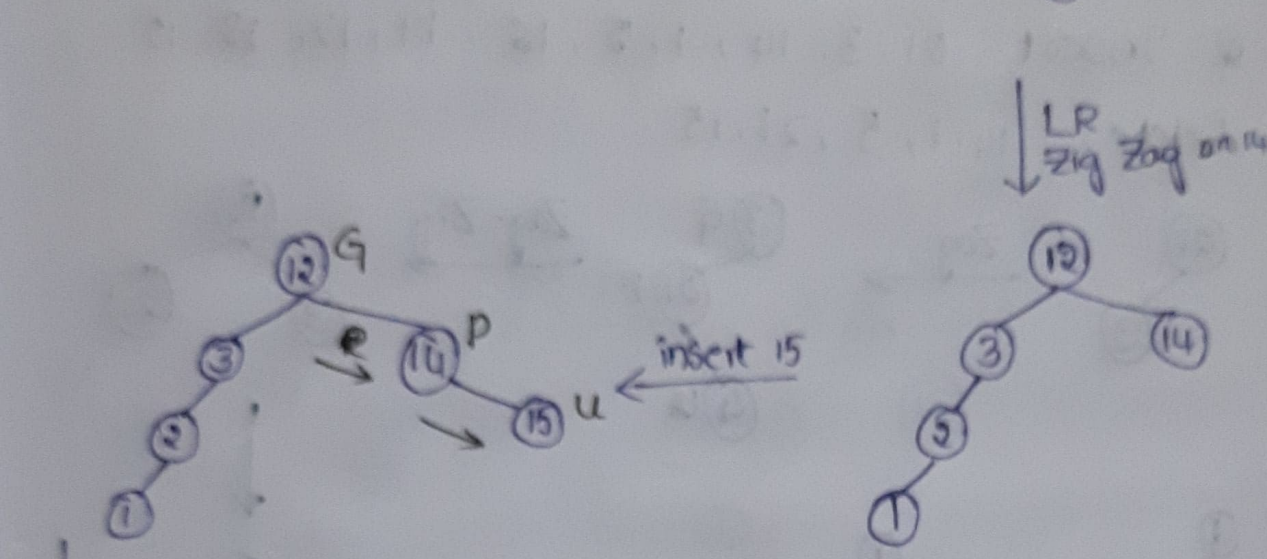


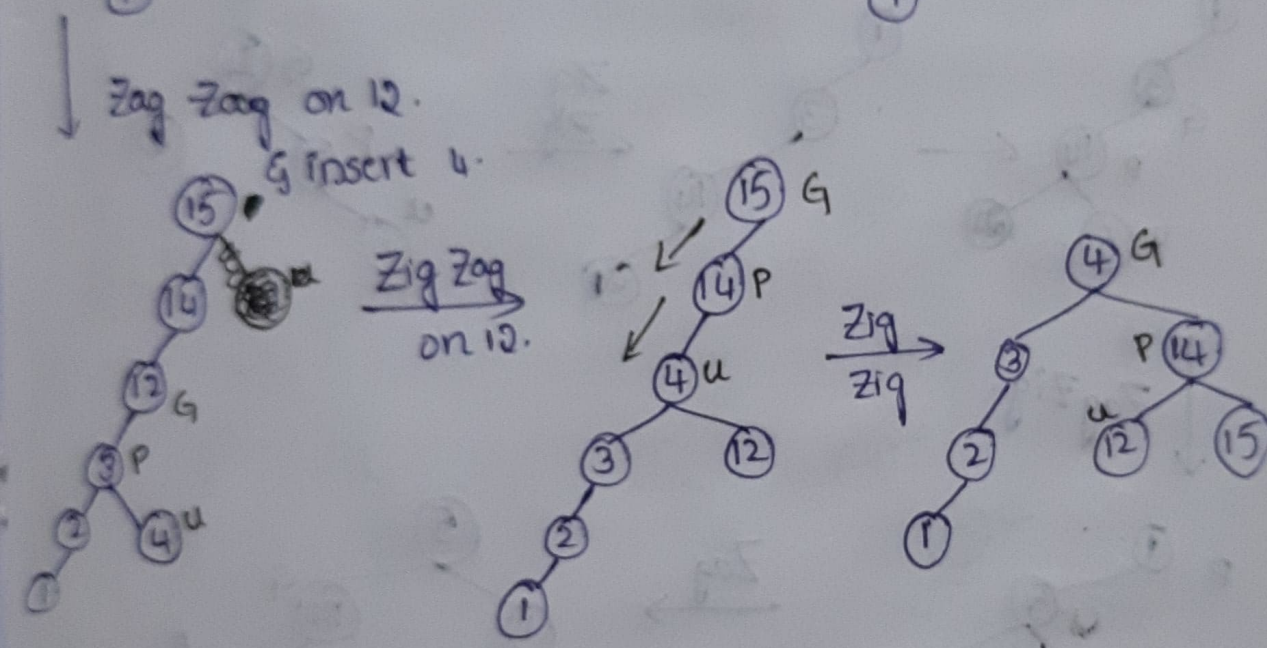
Zag Zag

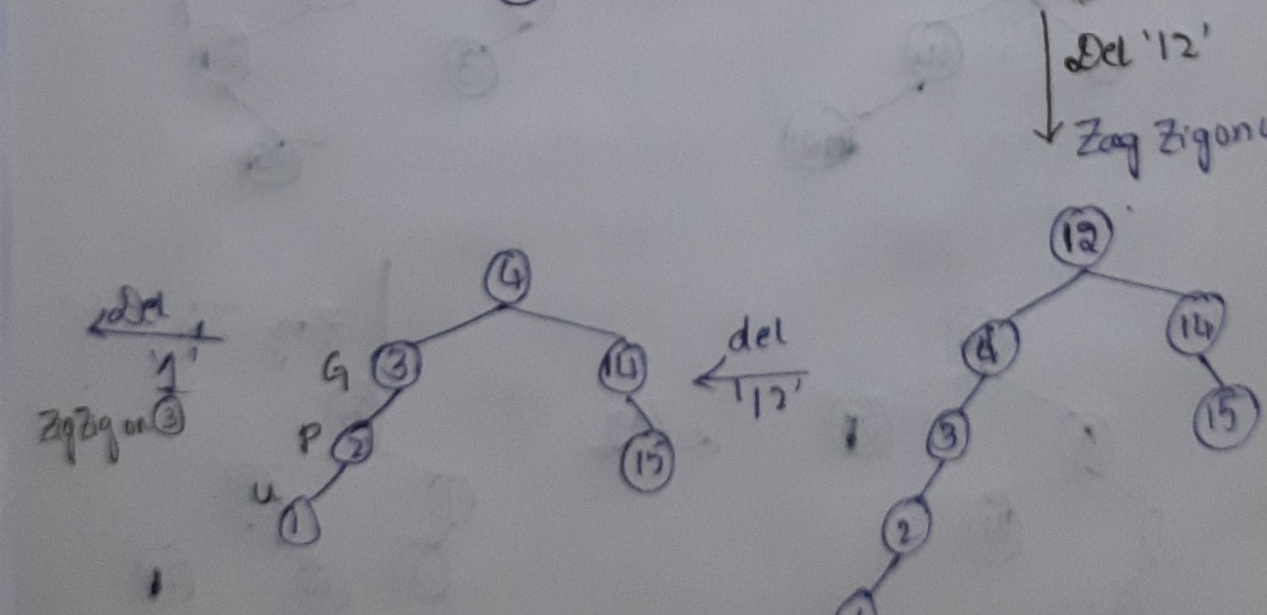


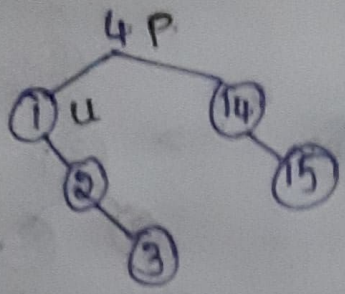
Q:- 1, 2, 3, 14, 12, 15, 4



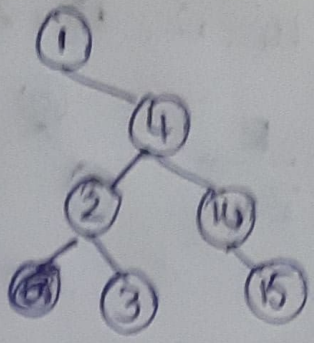








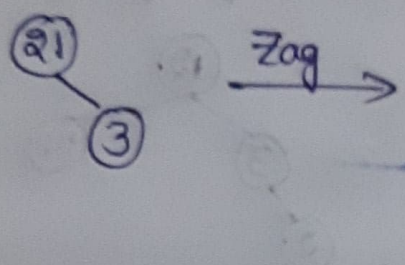
Zig on u



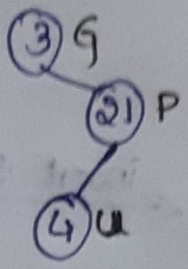
Del ① & replace with ③

Q- Insert 21, 3, 14, 1, 5, 16, 19, 12, 18, 15

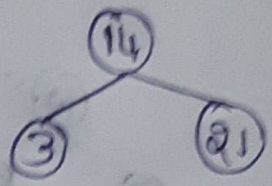
Delete - 14, 1, 5, 21, 15.

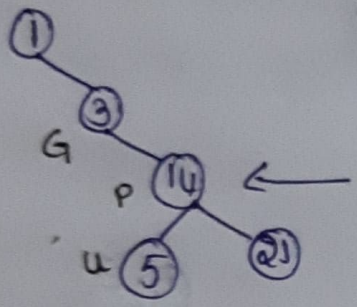


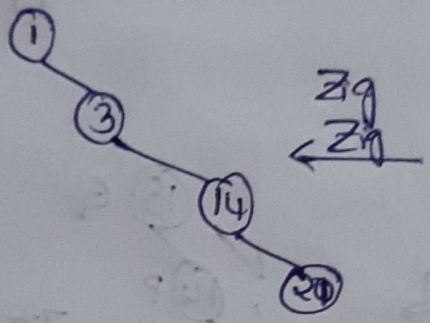
Zag



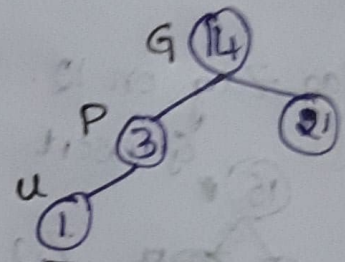
Zag-Zig



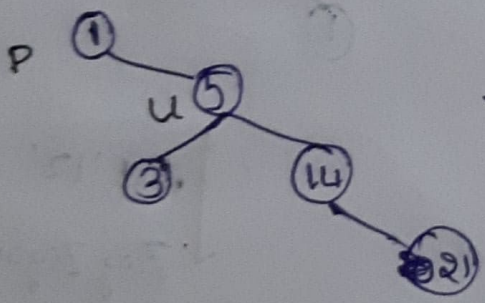




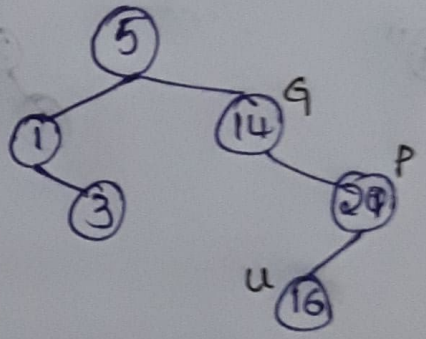
Zig
Zig

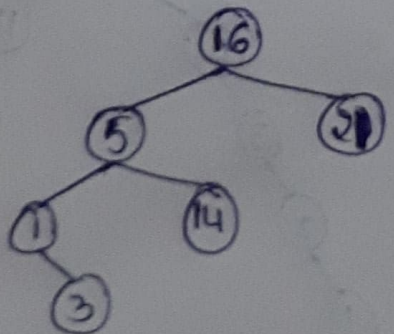


Zag Zig



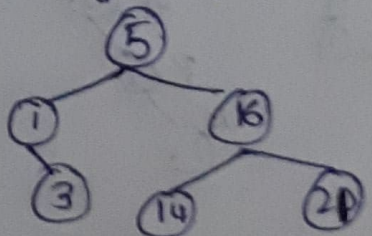
Zag

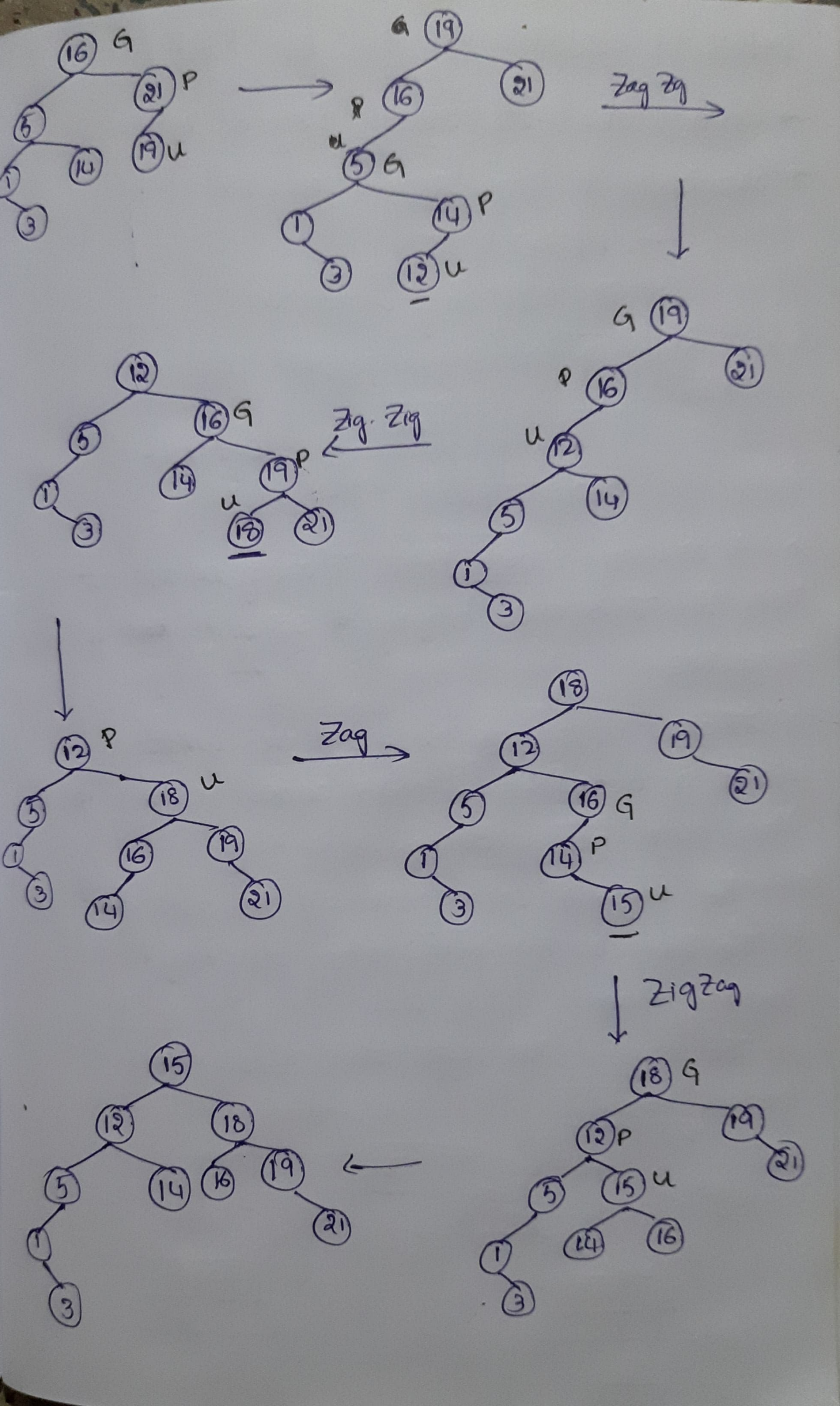




Zag

Zag-Zig




16 G
21 P
5
19 u
1
14
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19 G
16 P
21
5 G
1
14 P
3
12 u
Zag Zag
19 G
16 P
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12 u
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16 G
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19 P
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