

## Stack and Queue

- Q- Implement a method to insert an element at its bottom without using any other data structures using python.

Without using any other data structure we can insert an element at the bottom of a stack using recursion.

### Step by Step Execution:

Stack = [1, 2, 3, 4, 5]

Element to insert = 0.

- 1) Pop 5, call insert at bottom ([1, 2, 3, 4], 0)
- 2) pop 4, call insert at bottom ([1, 2, 3], 0)
- 3) pop 3, call insert at bottom ([1, 2], 0)
- 4) pop 2, call insert at bottom ([1], 0)
- 5) pop 1, call insert at bottom ([], 0)

Insert 0: stack = [0]

Push 1 back  $\rightarrow$  stack = [0, 1]

push 2 back  $\rightarrow$  stack = [0, 1, 2]

push 3 back  $\rightarrow$  stack = [0, 1, 2, 3]

push 4 back  $\rightarrow$  stack = [0, 1, 2, 3, 4]

push 5 back  $\rightarrow$  stack = [0, 1, 2, 3, 5]