Stacks
Definition

- The stack is a list-like structure in which elements may be inserted or removed from only one end.
- While this restriction makes stacks less flexible than lists, it also makes stacks both efficient and easy to implement.
- LIFO = Last-In, First-Out
Elements and Operations

- The accessible element of the stack is called the top element.
- Elements are not said to be inserted, they are pushed onto the stack. When removed, an element is said to be popped from the stack.
A stack grows if a single node is inserted into its top position. No way of assigning values directly to stack nodes is available in a pure stack. The formal operation that inserts a node into a stack is PUSH.

The top node must be removed from a stack before the values of other nodes can be retrieved.
Example
OS pushes command line on top of stack and calls main

main pushes local variables on top of stack

main pushes arguments to func1 and calls func1

func1 pushes local variables on top of stack

func1 pushes arguments to func2 and calls func2

func2 pushes local variables on top of stack

func2 returns to func1 removing arguments to func2

func1 returns to main removing arguments to func1

main pushes arguments to func4 and calls func4

func4 pushes local variables on top of stack

func4 returns to main removing arguments to func4

main returns to OS