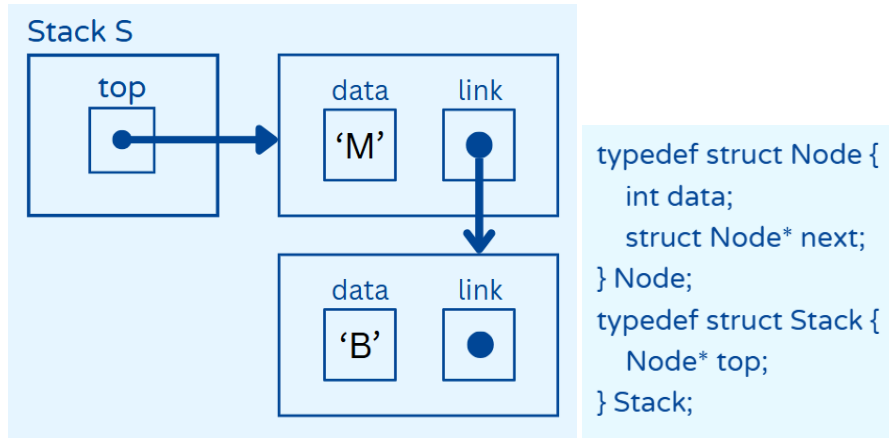


LL Stack

Variation 1

Stack is a linked list. TOP is a pointer to the first node of the list. It is initialized to **NULL** indicating empty.



Operations	Checklist	Example
<code>Stack* initialize();</code>	<ul style="list-style-type: none"><input type="checkbox"/> Allocate memory for the stack structure<input type="checkbox"/> Initialize the stack's top pointer to NULL<input type="checkbox"/> Return the pointer to the stack	<code>Stack* S = initialize();</code>
<code>bool isFull(Stack* s);</code>	<ul style="list-style-type: none"><input type="checkbox"/> Return false (linked list can never be full)	
<code>bool isEmpty(Stack* s);</code>	<ul style="list-style-type: none"><input type="checkbox"/> The stack is empty if its top pointer is NULL	
<code>void push(Stack* s, int value);</code>	<ul style="list-style-type: none"><input type="checkbox"/> Allocate memory for a new node<input type="checkbox"/> Set the data of the new node<input type="checkbox"/> Link the new node to the current top of the stack	Before: top -> 5 -> 3 -> 1 -> NULL <code>push(S, 4);</code>

	<input type="checkbox"/> Update the stack's top pointer to point to the new node	After: top -> 4 -> 5 -> 3 -> 1 -> NULL
<code>int pop(Stack* s);</code>	<input type="checkbox"/> Check if the stack is empty before attempting to pop <input type="checkbox"/> Get a temporary pointer to the top node <input type="checkbox"/> Store the data of the top node <input type="checkbox"/> Move the top pointer to the next node <input type="checkbox"/> Free the memory of the old top node using temp <input type="checkbox"/> Return the stored value	Before: top -> 5 -> 3 -> 1 -> NULL int value = pop(S); After: top -> 3 -> 1 -> NULL
<code>int peek(Stack* s);</code>	<input type="checkbox"/> Check if the stack is empty <input type="checkbox"/> Return the data of the top node	
<code>void display(Stack* s);</code>	<input type="checkbox"/> Check if the stack is empty <input type="checkbox"/> Create a temporary pointer to traverse the list <input type="checkbox"/> Traverse the linked list and print each element's data	

Note:

For most operations, it is also common to return a **boolean value** representing whether the operation is successful or not.

