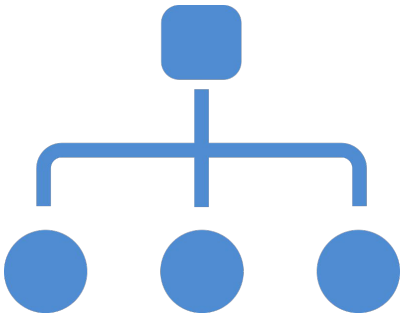
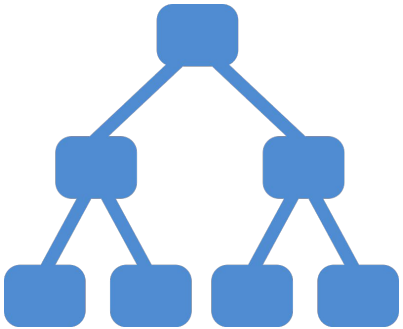
DATA STRUCTURES

Data Structures & Applications
Stacks & Queues
Infix, PostFix & Prefix

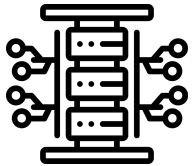
Data Structure

It’s a physical implementation that clearly defines a way of storing, accessing and manipulating data.





Types of D.S.



1. *Simple Data Structures* are built from primitive data types like integers, characters, booleans.

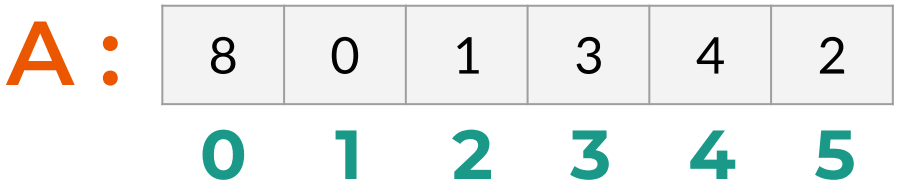
   e.g. : Arrays & Lists

2. *Compound Data Structures* are made by combining simple data structures in different ways.

Linear Data Structures	Non Linear Data Structures
i. Stack ii. Queue iii. Linked List	i. Tree ii. Graph iii. etc.

Linear List Arrays

Arrays refer to a named list of a finite number **n** of same type of elements.



Arrays can be one dimensional, two-dimensional or multi-dimensional.

Stacks

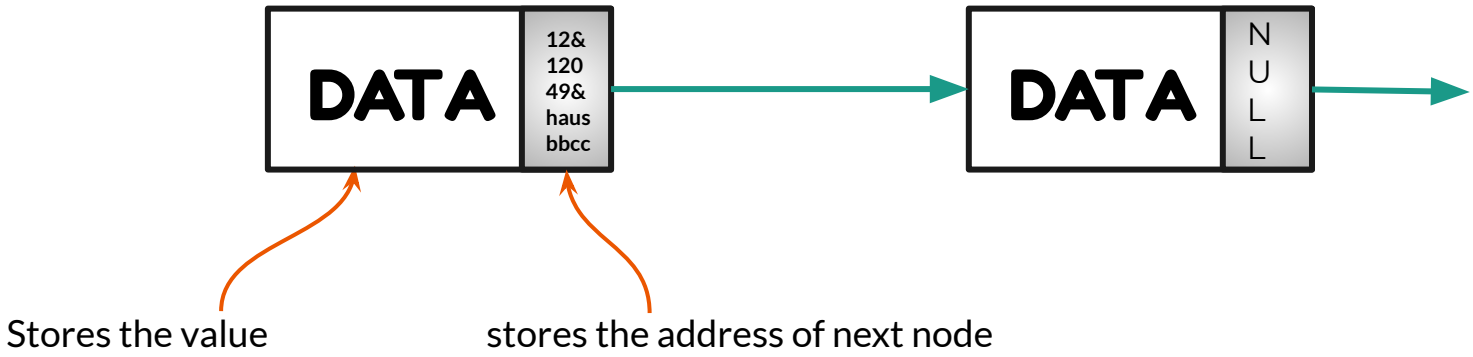
Last In First Out

There's a special way to store lists where we use LIFO technique.

Insertion & Deletion both takes place at the top.

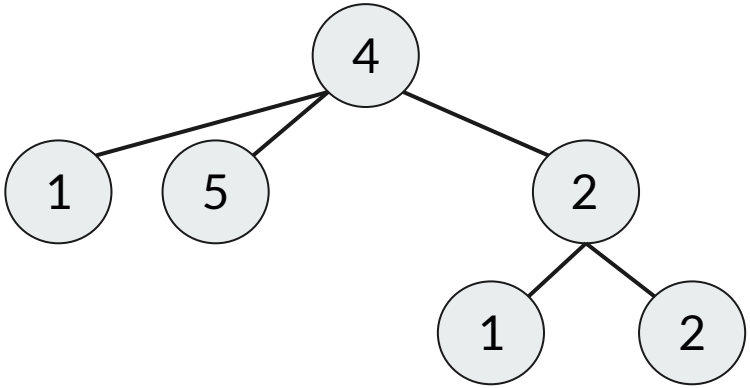
Linked List

As the name suggests, it's a list like implementation where elements are linked.

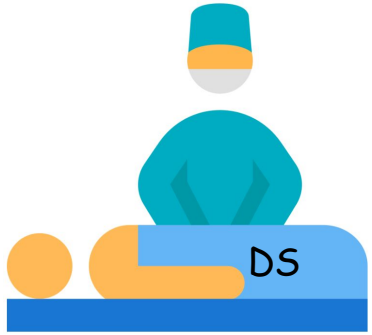


Trees

Trees are multilevel data structures having a hierarchical relationship among its elements.
In a linked list, each node stores data & address of next node.
In a Tree, each node stores data & address(es) of child node(s).



Operations on DS



1. Insertion means adding new data element.
2. Deletion means deleting some data element.
3. Searching means finding(maybe index) of some data.
4. Traversal means walking in all elements.
5. Sorting means arranging elements in some order.
6. Merging means combining similar DS.

Stacks

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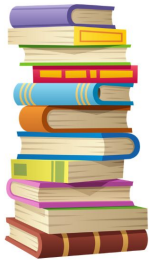
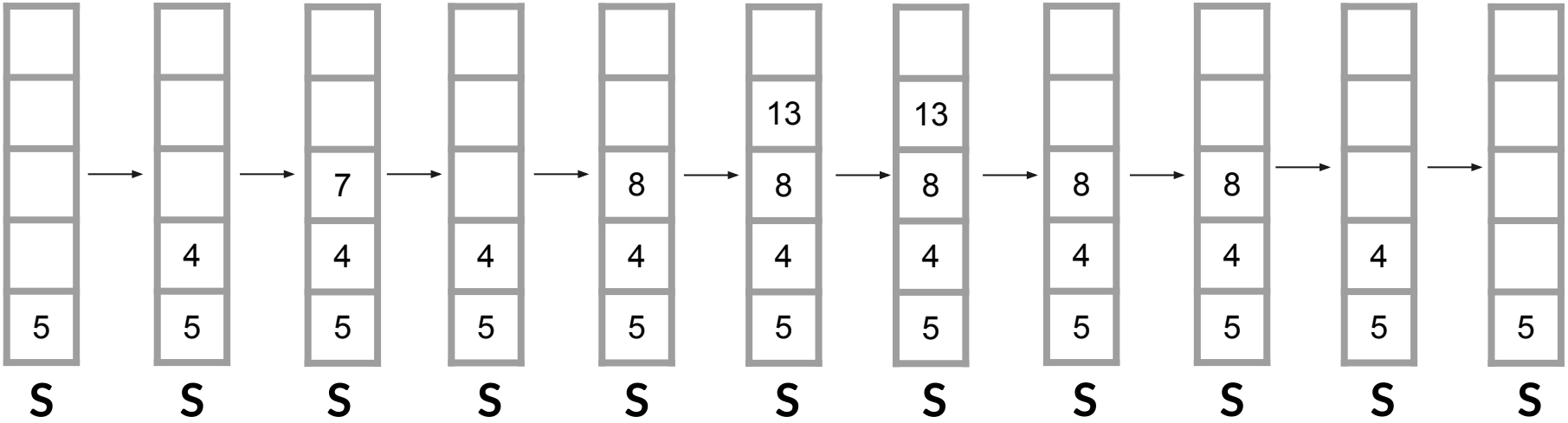
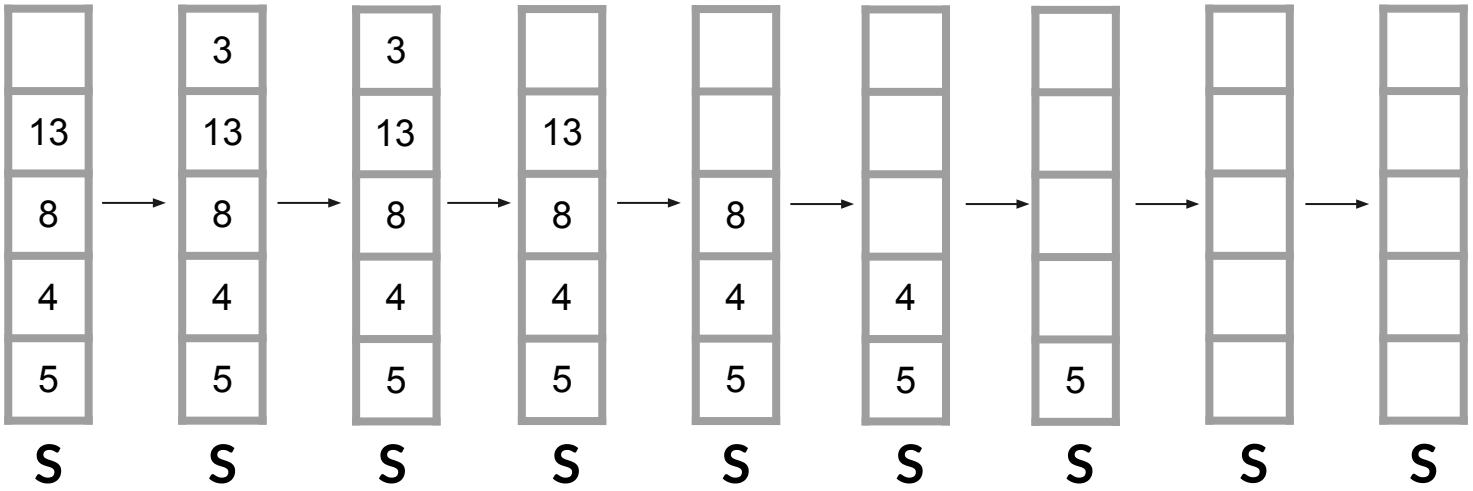
Stacks





Stacks



Implementing Stack

To implement a stack we need to make its functions,

1. isEmpty(s)
2. **Push(s,i)**
3. **Pop(s)**
4. **Peek(s)**
5. Display(s)

We need to maintain **top** of stack, and make it None when stack is empty.

STACK IMPLEMENT CODE