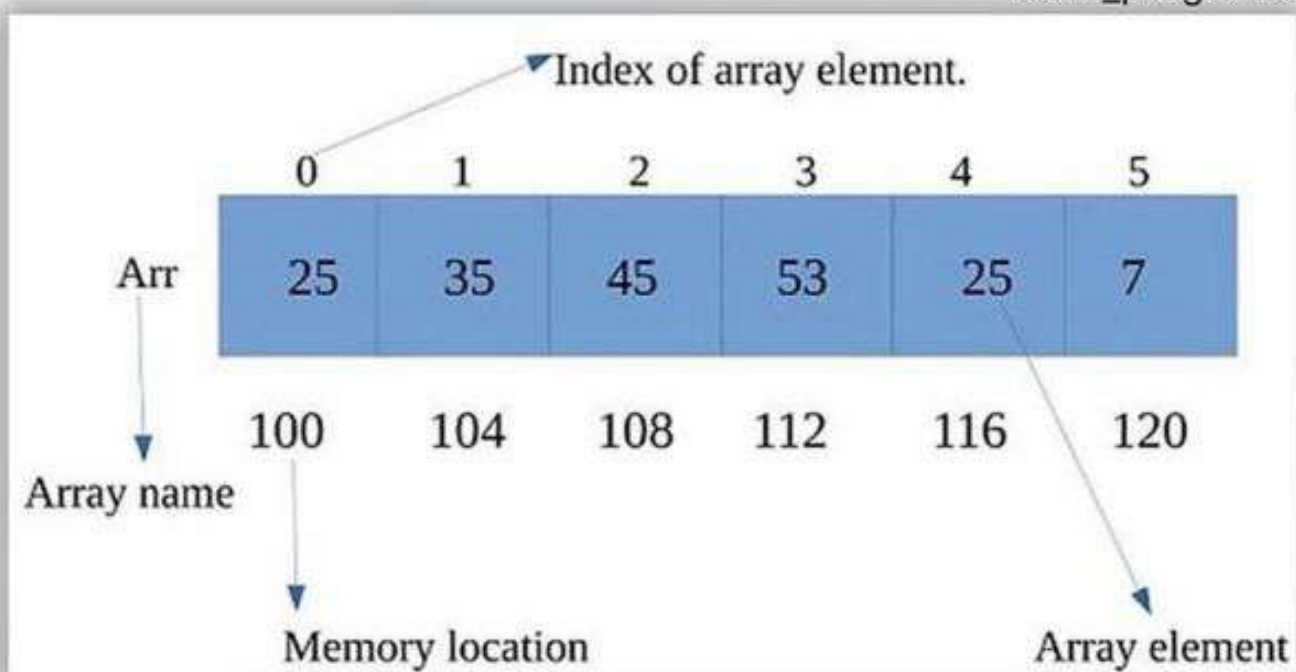All Data Structures

Array

An Array is a collection of items stored at contiguous memory locations. The idea is to store the multiple items of the same type together.
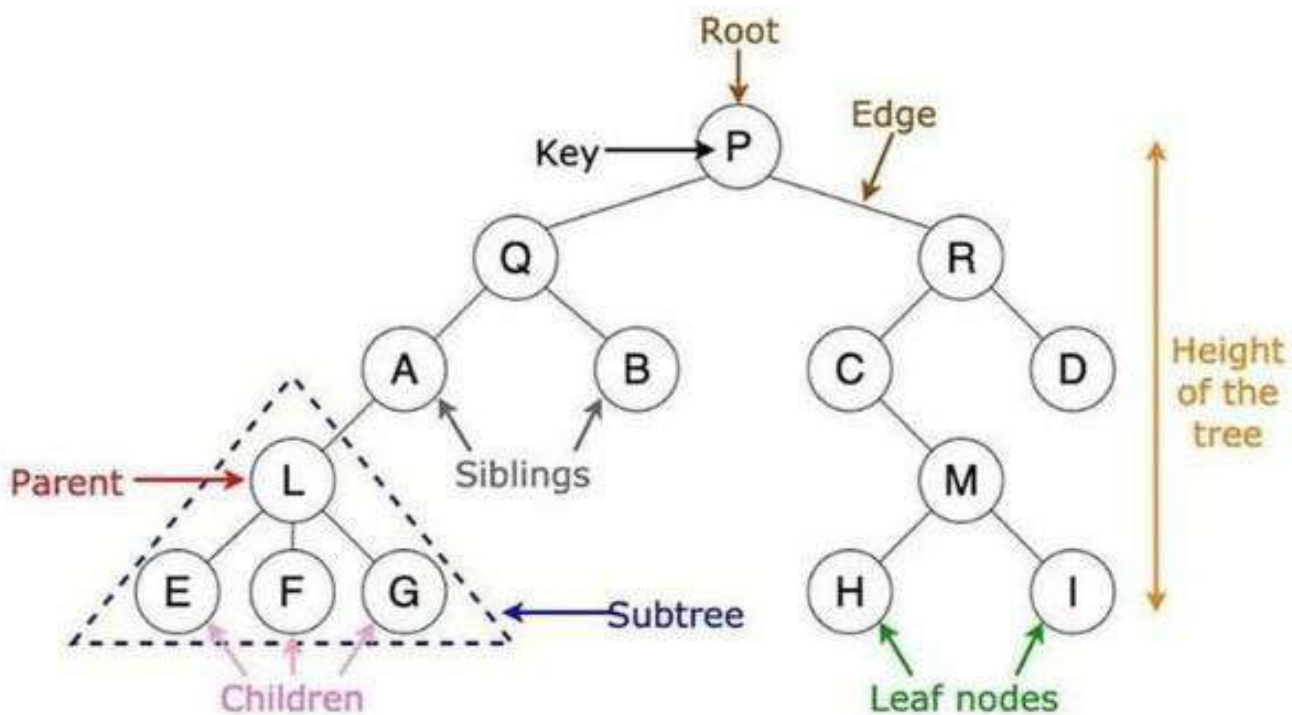
Index of array element.

	0	1	2	3	4	5
Arr	25	35	45	53	25	7
	100	104	108	112	116	120

Array name

Memory location

Array element

Tree

A Tree is a non-linear hierarhical data structure that consists of nodes connected by edges. A node is an entity that contains a key or value and pointers to its child nodes.
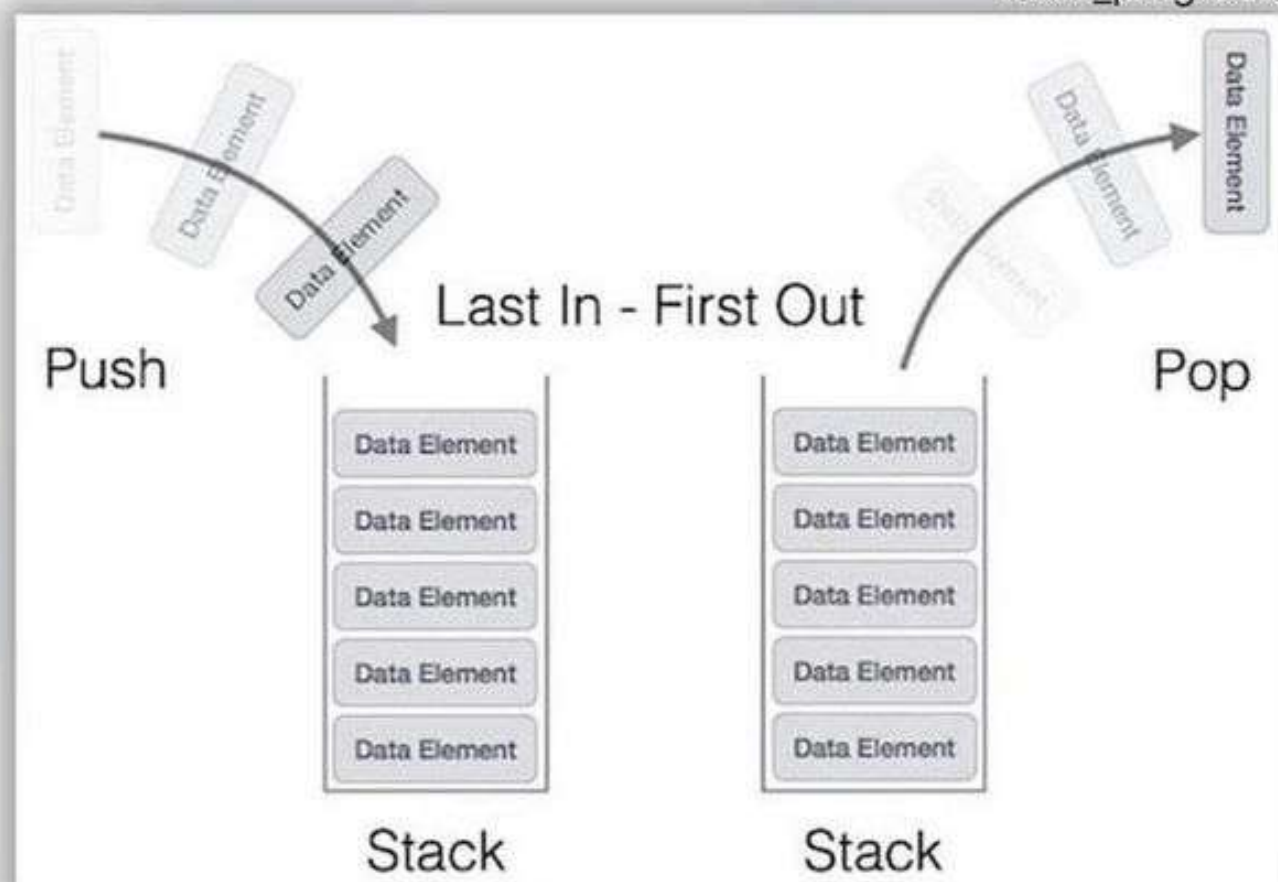
Stack

Stack is a linear data structure which follows a particular order in which the operations are performed. The order may be LIFO(Last In First Out) or FILO (First In Last Out).

Push

Last In - First Out

Pop

| Data Element |
| Data Element |
| Data Element |
| Data Element |
| Data Element |

Stack

| Data Element |
| Data Element |
| Data Element |
| Data Element |
| Data Element |

Stack

Graph

A Graph is a non-linear data structure consisting of vertices and edges. The vertices are sometimes also reffered to as nodes and the edges are lines or arcs that connect any two nodes in the graph.
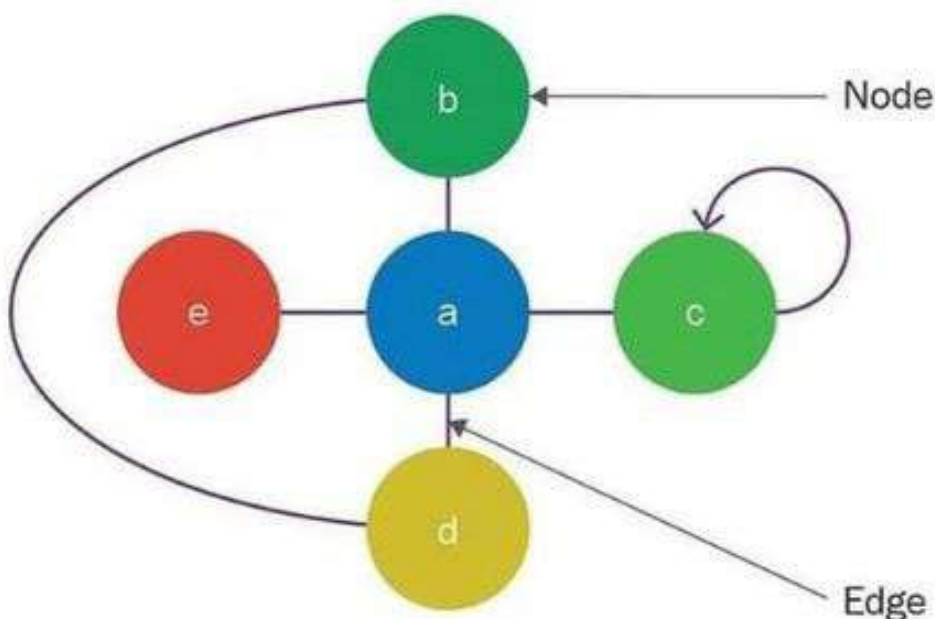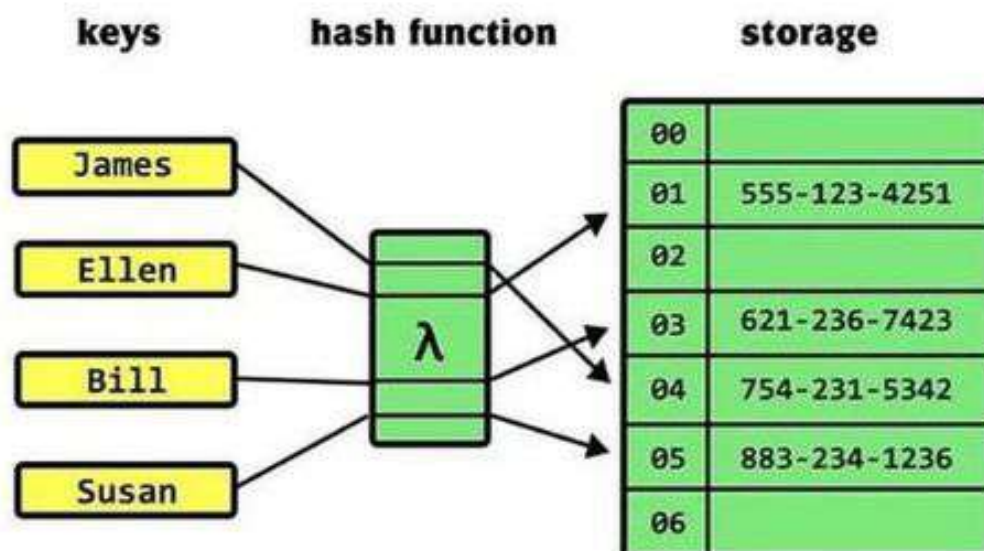
Hash Table

Hash Table is a data structure which stores data in an associative manner. In a hash table, data is stored in an array format, where each data value has its own unique index value.
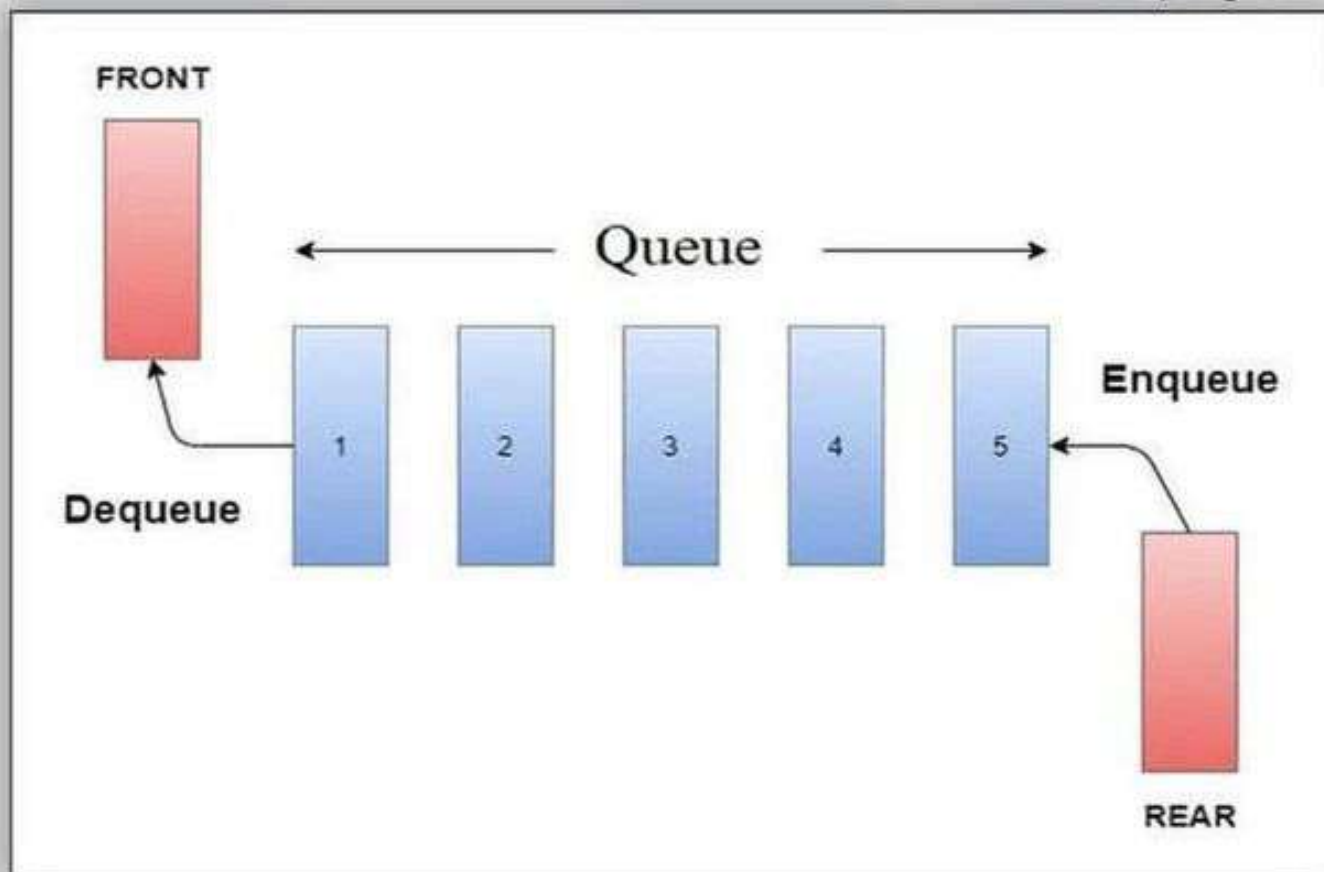
keys	hash function	storage	
James		00	
Ellen		01	555-123-4251
Bill	λ	02	
Susan		03	621-236-7423
		04	754-231-5342
		05	883-234-1236
		06	

Queue

A Queue is defined as a linear data structure which is open at both ends and the operations are performed in First In First Out (FIFO) order. The element which is first pushed into order, the operation is first performed on that.

Linked List

A Linked List is a linear data structure, in which the elements are not stored at contiguous memory locations. It consist of nodes where each node contains a data field and a link to the next node in the list.

Data ← [ ] → Address

Node

10 → 20 → 30 → 40

Linked List