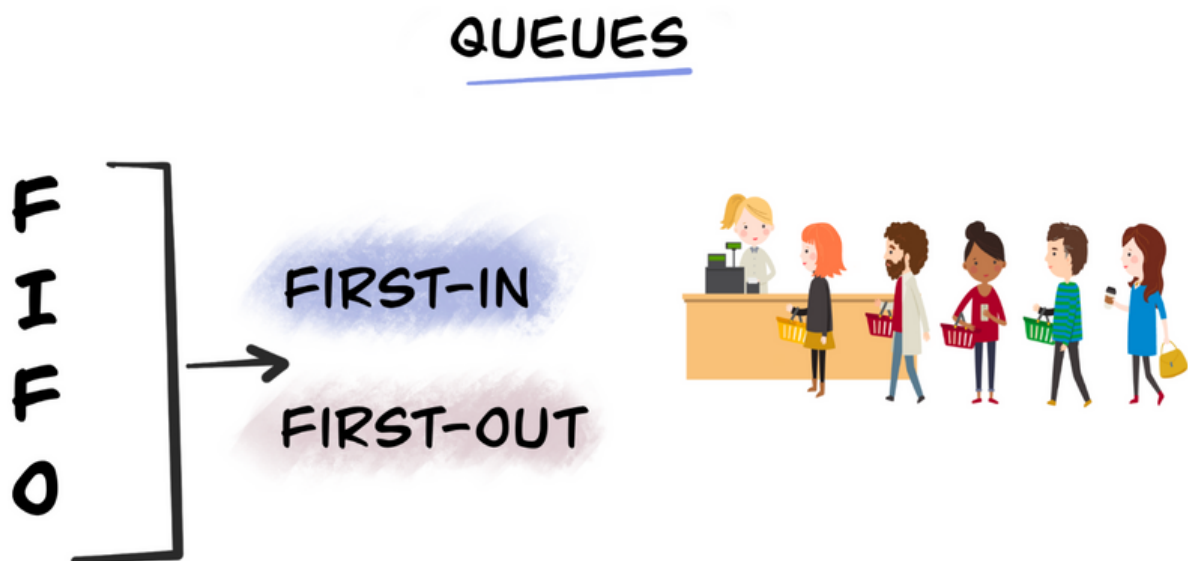


Data structures and Algorithms

What is a Queue?

- Queue is a linear data structure.
- It follows FIFO: First In First Out
- The addition of elements happens only at the end.
- The removal of elements happens only at the start. The element added first will be removed first. The element added last will be removed last.
- Real-world Examples:
 - Queue to board the metro/flight etc.
- Technical Examples:
 - Common Printer: If multiple people are using the same printer then the person who sent the print request first should get the printout first.



Data structures an Algorithms

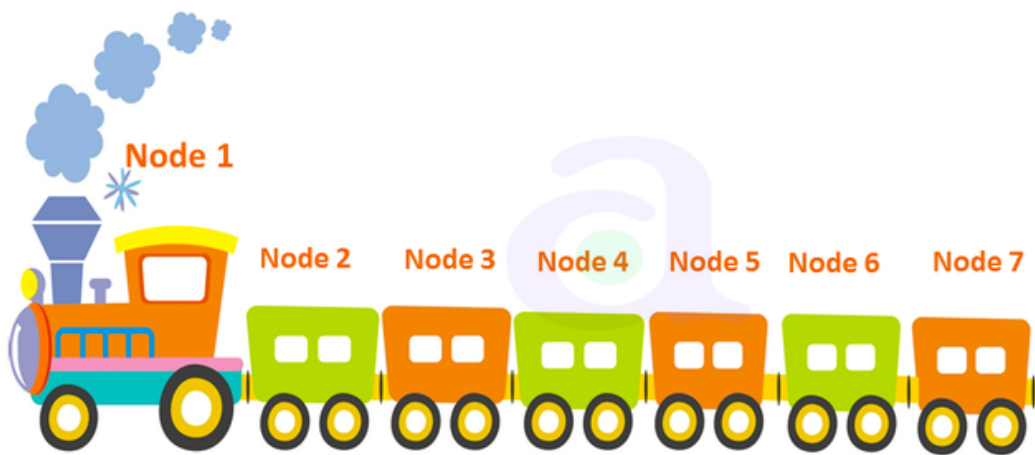
What is Linked List?

- A linked list is a sequence of data elements, which are connected together via links. Each data element contains a connection to another data element in form of a pointer.
- Each element (Node) consists of 2 components data and pointer.
- Components in Linked List
 - Head – Point to 1st Node
 - Tail – Point to Last Node
 - Node
 - Data or Value
 - Reference

Types of Link Lists

- Single Link List: In a single link list each node store the data of the node and reference to the next node
- Circular Single Link List: The last node of the link list refers to the first node
- Double Link List: Each node refers to previous and next node
- Circular Double Link List: Double Link List which is circular

Data structures an Algorithms



Common Operations On Single LL

- Creation of LL
- Traversal
- Insertion of Data
- Searching a given Value
- Deletion of Node

Data structures and Algorithms

Runtime Analysis

- It is a study of runtime of a given algorithm, by identifying its behaviour as the input size for the algo increases.
- What is the performance of a given algorithm.
- Why do we need to measure the efficiency of the given algorithm?
Basically, it tells us if our algo is good enough to give faster response on bigger data.

Types of Notations

- Omega Ω = 10sec [Best Case Scenario]
 - Gives the tighter lower bound for a given algorithm
 - Running time will not be less than this given time
- Big O = 100sec [Worst Case Scenario]
 - Gives the tighter upper bound for a given algorithm
 - Running time will not be greater than the given time
- Theta Θ – [Average Case Scenario]
 - Decides the upper bound and lower bound are same or not.
 - Running time of a given algorithm will be on an average be equal to this.



**KEEP
LEARNING
AND
HAPPY
CODING**