Data structure and algorithm

Stack:

1. Linear abstract data structure where the elements could be added or deleted only at one open end called the top of the stack
2. The elements follow ‘Last in First out Order’, typically called LIFO
3. Insertion into the stack is called ‘Push’ operation and deletion from the stack is called ‘Pop’ operation
4. If the stack is full it is said to be in ‘Overflow’ state, and push is rejected if stack is overflow
5. If the state is empty it is said to be in ‘Underflow’ state, and pop is rejected if stack is underflow

Queue:

1. Queue is a linear data structure with two open ends, called the rear and the front end, elements are added at the rear end and deleted from the front end
2. Elements in a queue typically follows first in first out order, that is element inserted first will be always deleted first, FIFO
3. Double ended queue, priority queue, circular queue

Linked list:

1. Problem with the array:
   1. Size of the array
   2. Once allocated with a size it is a hazard to change the size of the array in runtime
   3. Performing the insertion and deletion operation at any point between the first and the last index of the existing elements
2. Adding a new element or deleting an existing element is independent to number of elements in the linked list, no shifting kind of activities like array are required
3. In linked list elements are added one at a time dynamically on as and when required basis – you don not need to mention the size when you create a linked list

Binary tree:

1. In-order: left-mid-right, Pre-order: mid-left-right, Post-order: left-right-mid
2. A binary tree is a set of three disjoint subset, where the first subset is called the root, the other subsets are either empty or themselves binary
3. In almost complete binary tree insertion takes place level by level left to right

Heap:

1. Heap is an almost complete binary tree such that each node should contain a key value that is at least or larger than it’s children, with the largest key value always at the root. Such a heap is called a MAX heap. For a MIN heap each node contains key field value that is less than equal to the key field value of it’s children and for a MIN heap the root contains the smallest value.