Data Structure Interview Questions.

By : @curious_.programmer.

1] What is a Data Structure?

→ • Data structure is a method that organizing the data in memory.
• Data structure is a specialized format for organizing, processing, retrieving & storing data.
• Data structure includes Array, Pointer, linked, list, Stack, Queue, structure, graph, Searching, Sorting, Programs, etc.
• Data structure is not a programming language.
• It is set of algorithm is use in any programming language to store the data in memory.
• Types of data structures
  i) Linear data structure.
  ii) Non-linear data structure.

2] What is Linear data structure?

→ . In linear data structure elements are stored sequentially.
. And each element are connected to previous and next element.
. Array, Linked list, stack and Queue are different types of linear data structures available.
. Linear data structure are easy to implement.

3] What is non-linear data structure?

→ . In non-linear data structure elements are not arranged sequencially.
. Non-linear data structure is not easy to implement.
. It uses device memory efficiently.
. Trees and graph are examples of non-linear data structure.

4] What is array?

→ . An array is data structure for storing more than one data item that has similar data types.
. An array stored that position of each element can be computed from its index by its formula.
. In an array searching of element is easy by using index number.

5] What is multidimensional array?

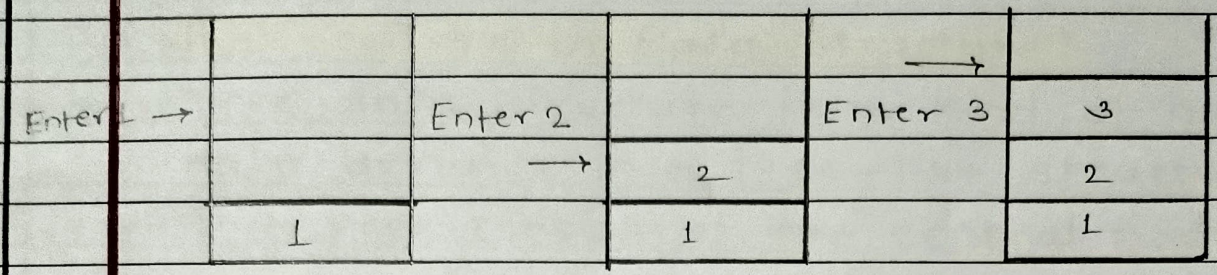
→ . A multidimensional array is with more than one dimension.
. It is an array of array
. 2-D array are most commonly used.
- They are used to store data in tubular manner.

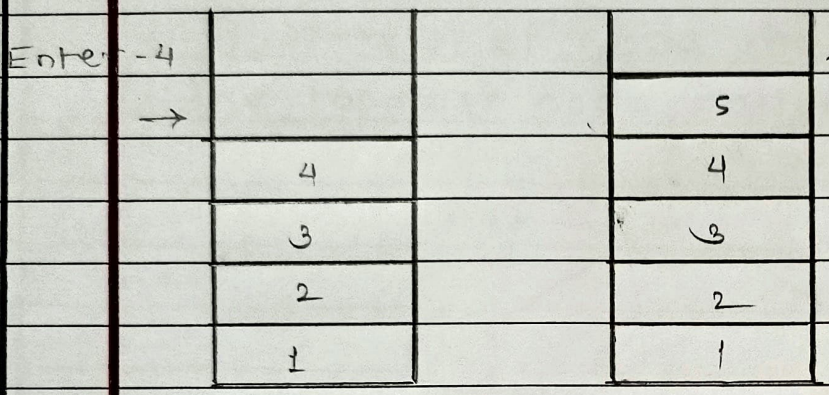
6] What is linked list in data structure?

→ . It is a sequence of data structure, which are connected together via links.
. Each link contain a connection to another link.
. Linked list can grow & shrink its size, as per the requirement.
. It does not waste memory space.
. Types of linked lists:
  i) Singly linked list
  ii) Doubly linked list.
  iii) Circular linked list.

7] What is stack?

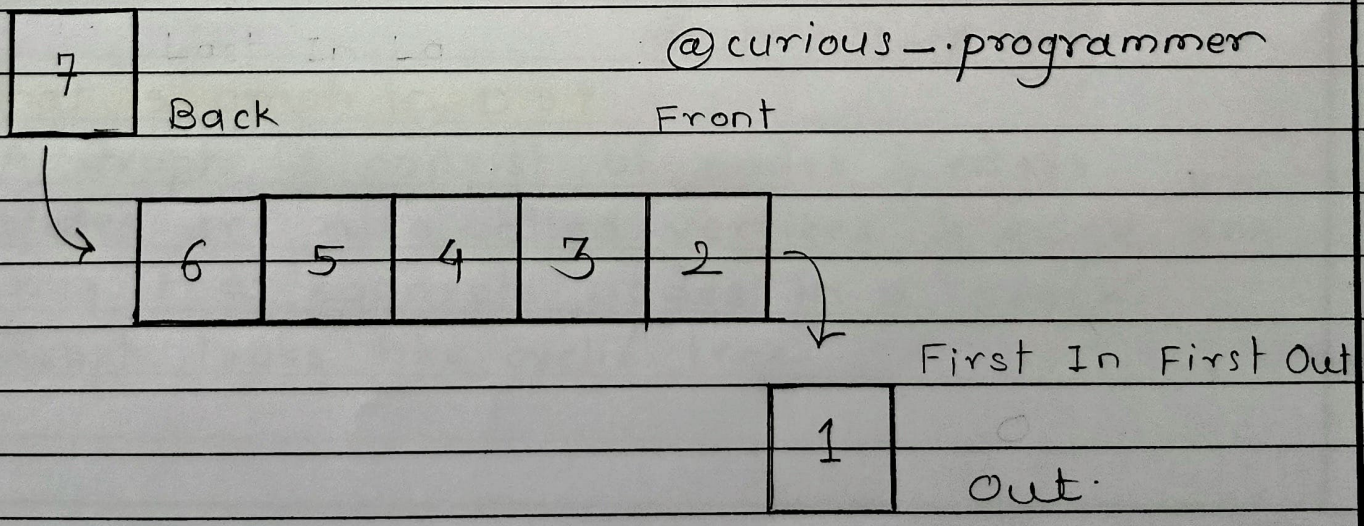
→ . Stack is a linear data structure.
. Stack follows LIFO (Last In First Out) or FILO (First In Last Out).
. In stack elements are added from top.
. And element can deleted only from ~~stack~~.top.

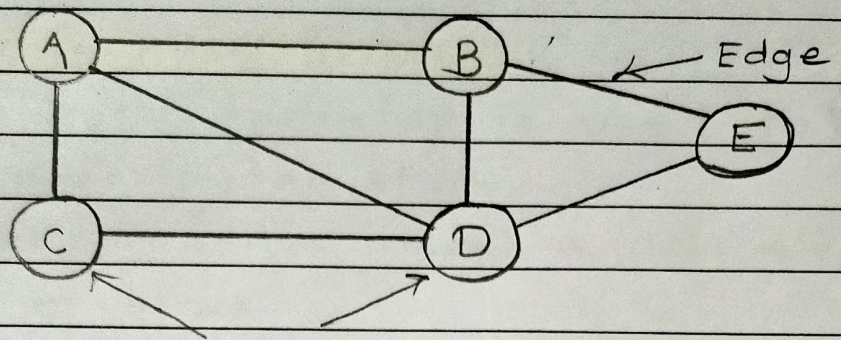




8] What is queue data structure.

→ • Queue is a linear data structure.
• It follows First In First Out (FIFO)
• Once a new element is inserted into queue all elements inserted before new element in queue must be removed to remove new element.





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15] What is an algorithm?

→ · An algorithm is a step by step method of solving a problem.
· It defines a set of instruction to be executed in certain order to get correct output.
· The algorithm designed are language independent.

16] What is merge sort?

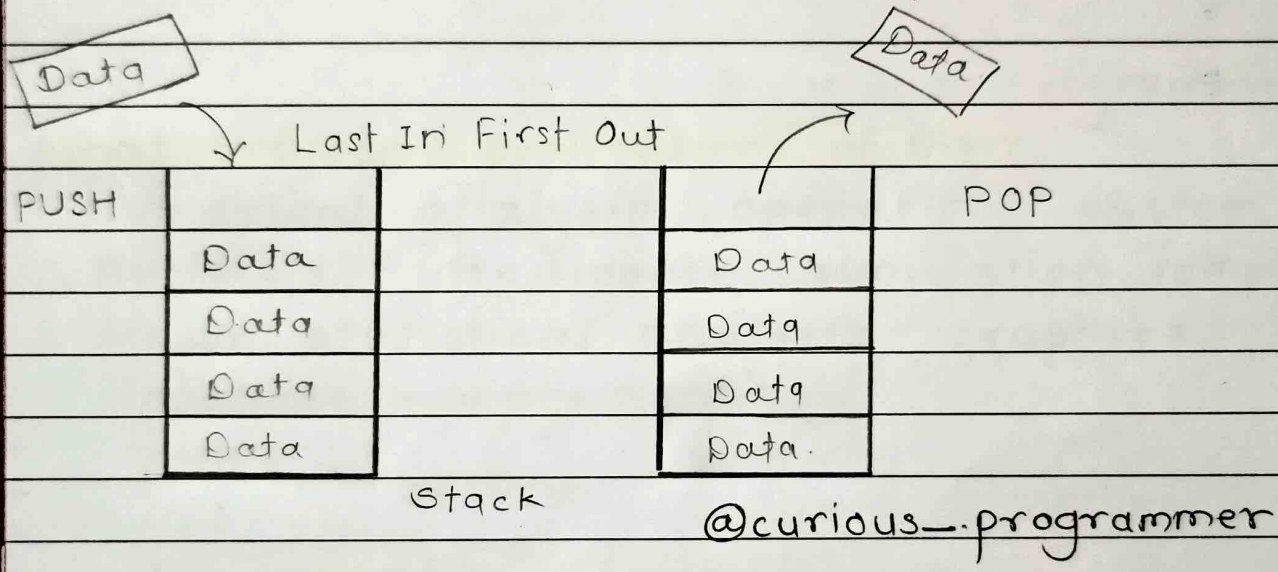
→ · Merge sort divides the array into two parts then sort it and combine it.
· It takes time of (n logn) in worst case.

17] What is selection sort?

→ · In selection sort to find the minimum element in every iteration and place it in the array beginning from first index.
· Selection sort also divided into sorted and unsorted subarray.

18] What is PUSH in D.S.?

→ • The PUSH operator is used to insert a new element in the stack.
• PUSH operation insert a new element at the top of stack.
• If insert a new element in full stack, a overflow condition occurs.
• PUSH add one element on top of the stack.



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19] What is POP in D.S?

→ • The POP operator is used to remove a element from stack.
• POP operation removes a element from top of stack.
• Stack underflow condition occur when stack is empty and we try to delete element from stack.

20] **What are dynamic D.S.?**

→ • It is collection of data in memory that expand and contract to grow or shrink in size as a program runs.
• This enables the programmer to control exactly how much memory is to be utilized.
• Examples : dynamic array, linked list, stack, queue, and heap.

21] **What are some applications of D.S.?**

→ • Numerical analysis, operating system, Artificial intelligence, simulation, compiler design, statistical analysis, graphics, database management.

22] **What is a postfix expression?**

→ • A postfix expression is a collection of operator and operands in which the operator is placed after. the operands.
• In a postfix expression the operator follows the operands.

23] **What is a dequeue?**

→ • Deque is a type of queue in which insertion & removal of element can either be performed from the front or the rear.
• It not follows FIFO Rule.

24 What are binary trees?

→ · A binary tree is a tree data structure in which each parent node can have at most two children.

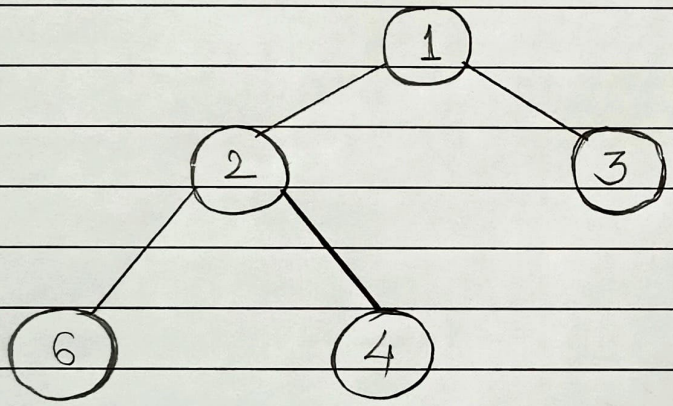
· We named it Left child and right child.

· Binary tree contain:

i) Data

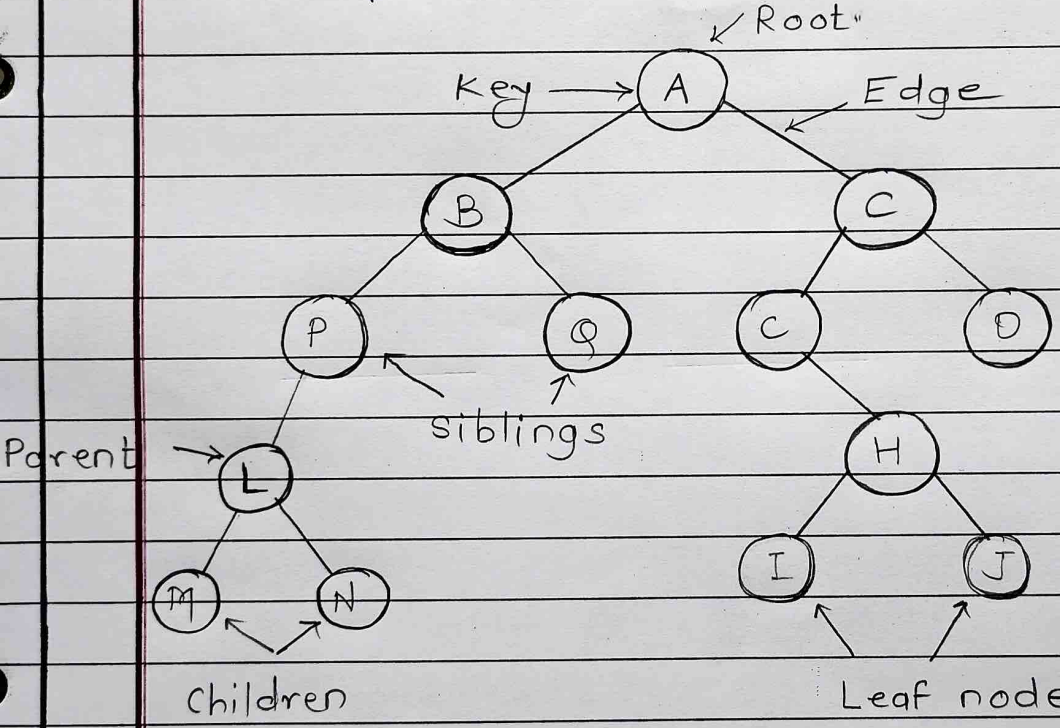
ii) Pointer to Left child.

iii) Pointer to Right child.



9] **What is Tree in Data Structure?**

→
- Tree data structure is a kind of hierarchical data arrange in a tree-like structure.
- This tree consist of ~~foo~~ central node, structural node, and sub nodes.
- It consist of node that node stores a value.
- The topmost node called root node.



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10] **What is graph in D.S?**

→
- A Graph is consist of nodes & edges.
- Nodes are also called vertices & edge are arcs. that connects nodes in a graph.
- Graph looks like cyclic tree.