

DATA STRUCTURE INTERVIEW QUESTIONS.

1] What is a data structure?

- ⇒ Data structure is a method that organizing the data in memory.
- Data structure is 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.

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2]. What is Linear data structure?

- ⇒ In Linear data structure elements are stored in sequentially.
- And each element are connected to previous and next element.
 - Array, Linked list, stack and Queue are different type 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 sequentially.
- 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 stores 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 tabular manner.

6]. What is linked list in data structure?

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

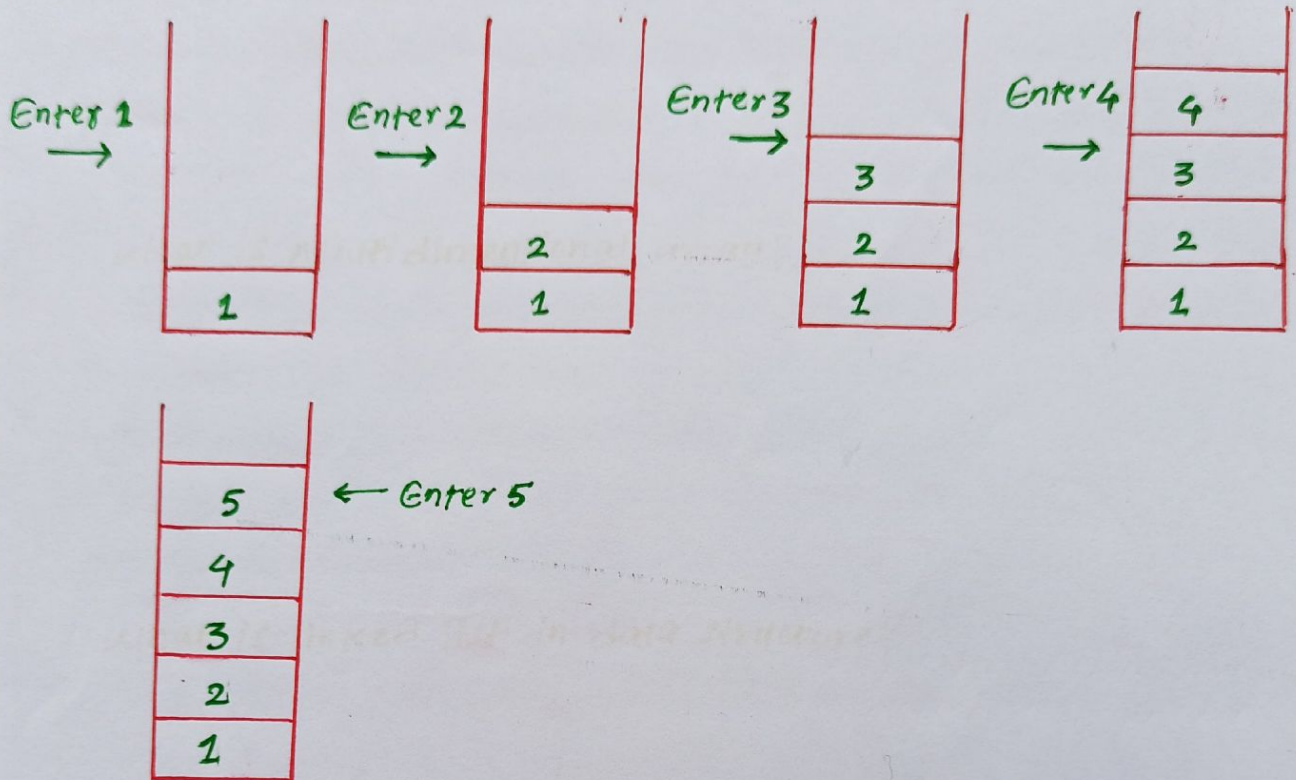
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7]. What is Merge sort?

- ⇒ • Merge sort divides the array into two parts then sort it and combine it.
- It takes time of $(n \log n)$ in worst case.

8]. What is stack?

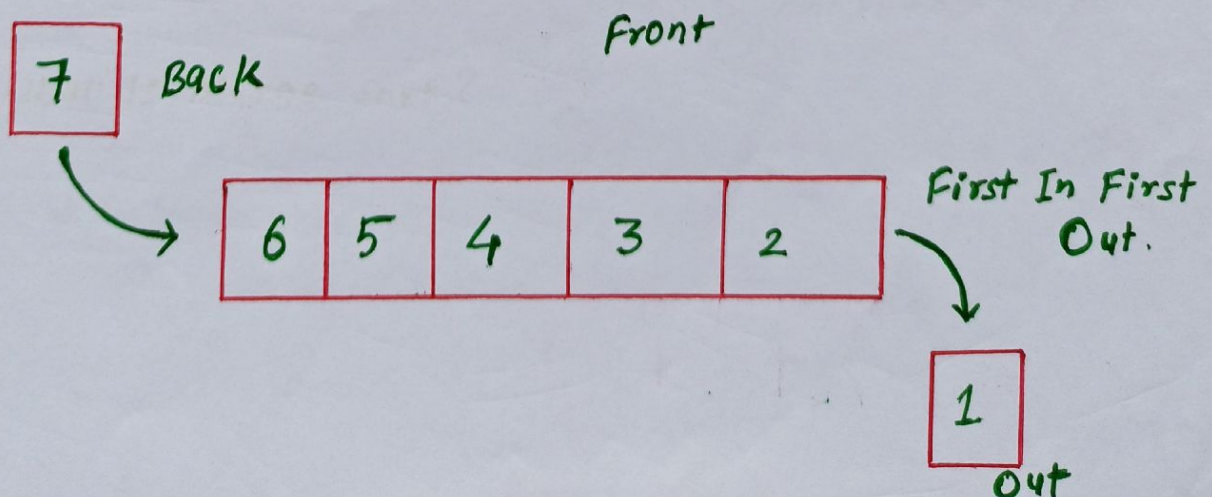
- ⇒ Stack is a linear data structure.
- Stack follows LIFO (Last In First Out) or FILO (First In Last Out).
- In stack elements are added from top.
- And element can be deleted only from top.



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9]. What is Queue data structure?

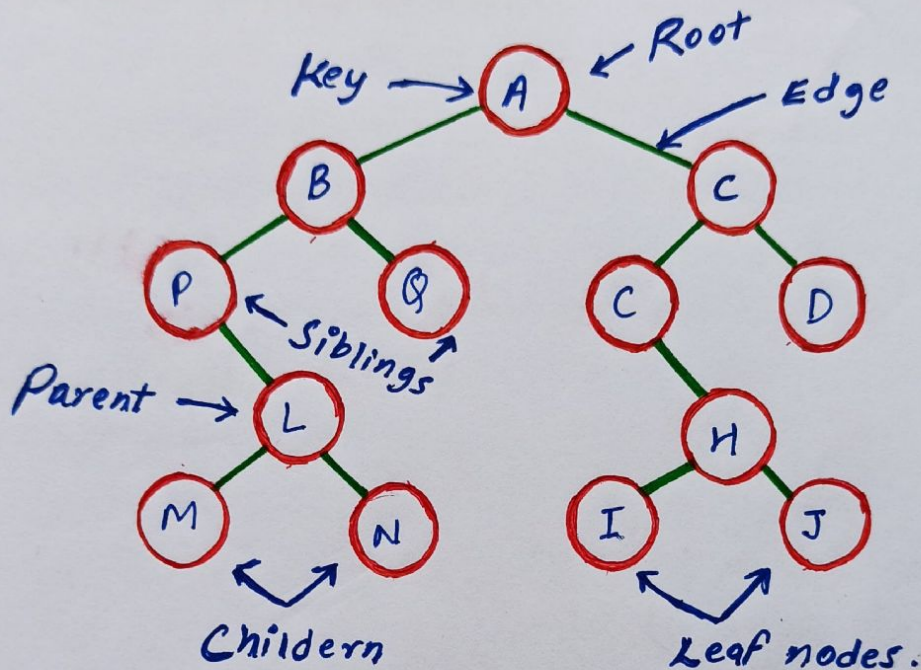
- ⇒ Queue is a linear data structure.
- It follows First In First Out (FIFO)
- Once a new element is inserted into queue all elements inserted before new element in queue must be removed to remove new element.



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10]. 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 central node structural node, and sub nodes.
- It consist of node that node stores a value.
- The topmost node called root node.

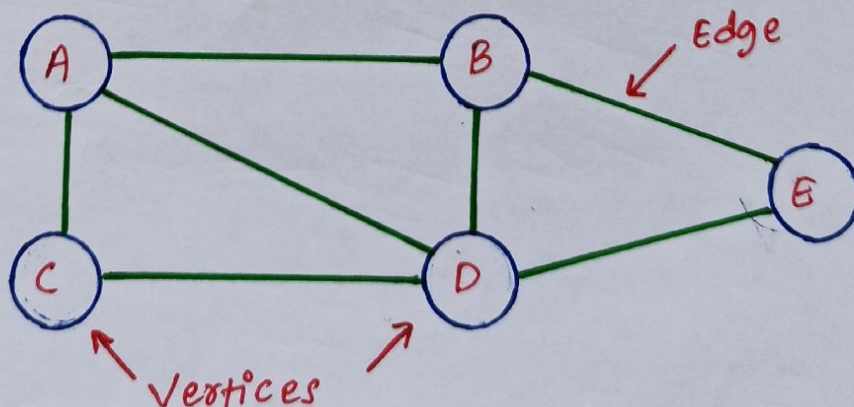


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11]. What is Graph in D.S.?

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



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12]. **What is an algorithm?**

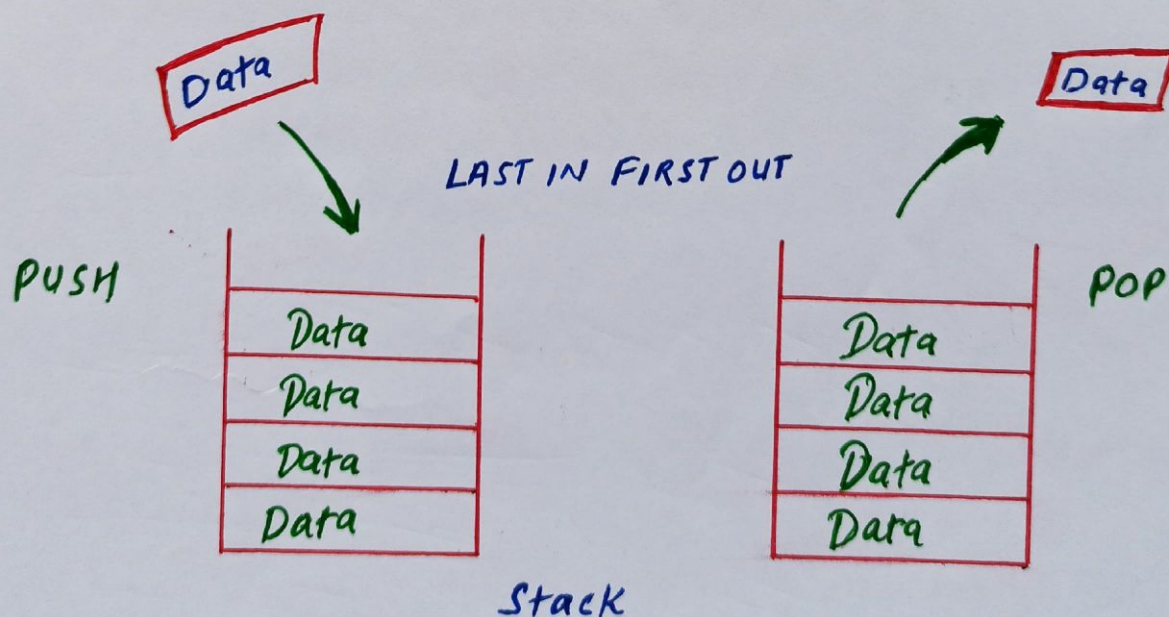
- ⇒ • An algorithm is a step by step method of solving a problem.
- It defines a set of instruction to be executed in certain order to get correct output.
 - The algorithm designed are language independent.

13]. **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.

14]. **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.



15]. **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 occurs when stack is empty and we try to delete element from stack.

16]. **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.*

17]. **What are the some application of D.S.?**

- ⇒ Numerical analysis, Operating system, Artificial Intelligence, Simulation, compiler design, statistical analysis, graphics, database management.

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18]. **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.

19]. **What is a dequeue?**

- ⇒ • Dequeue 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.

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20]. **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.

