20 Most asked DSA interview questions

1) What are dynamic data structures?

Answer - Dynamic data structures are structures that expand and contract as a program runs. It provides a flexible means of manipulating data because it can adjust according to the size of the data.

2) In what data structures are pointers applied?

Answer - Pointers that are used in linked list have various applications in the data structure. Data structures that make use of this concept include the Stack, Queue, Linked List and Binary Tree.

3) Do all declaration statements result in a fixed reservation in memory?

Answer - Most declarations do, with the exemption of pointers. Pointer declaration does not allocate memory for data, but for the address of the pointer variable. Actual memory allocation for the data comes during run-time.

4) What are ARRAYS?

Answer - When dealing with arrays, data is stored and retrieved using an index that refers to the element number in the data sequence. This means that data can be accessed in any order. In programming, an array is declared as a variable having a number of indexed elements.

5) What is the minimum number of queues needed when implementing a priority queue?

The minimum number of queues needed in this case is two. One queue is intended for sorting priorities while the other queue is used for actual storage of data.

6) Which sorting algorithm is considered the fastest?

There are many types of sorting algorithms: quick sort, bubble sort, balloon sort, radix sort, a particular data structure and data set. It would depend on the data set that you would want to sort.

7) Differentiate STACK from ARRAY.

Answer - Stack follows a LIFO pattern. It means that data access follows a sequence wherein the last data to be stored when the first one to be extracted. Arrays, on the other hand, does not follow a particular order and instead can be accessed by referring to the indexed element within the array.

8) Give a basic algorithm for searching a binary search tree.

1. If the tree is empty, then the target is not in the tree, end search .
2. If the tree is not empty, the target is in the tree.
3. Check if the target is in the root item.
4. If a target is not in the root item, check if a target is smaller than the root's value.
5. If a target is smaller than the root's value, search the left subtree.
6. Else, search the right subtree.

9) What is a dequeue?

Answer - A dequeue is a double-ended queue. This is a structure wherein elements can be inserted or removed from either end.

10) What is a bubble sort and how do you perform it?

Answer - A bubble sort is one sorting technique that can be applied to data structures such as an array. It works by comparing adjacent elements and exchanges their values if they are out of order. This method lets the smaller values "bubble" to the top of the list, while the larger value sinks to the bottom.

11) What are the parts of a linked list?

Answer - A linked list typically has two parts: the head and the tail. Between the head and tail lie the actual nodes. All these nodes are linked sequentially.

12) How does selection sort work?

Answer - Selection sort works by picking the smallest number from the list and placing it at the front. This process is repeated for the second position towards the end of the list. It is the simplest sort algorithm

13) What is a graph?

A graph is one type of data structure that contains a set of ordered pairs. These ordered pairs are also referred to as edges or arcs and are used to connect nodes where data can be stored and retrieved.

14) Differentiate linear from a nonlinear data structure.

Answer - The linear data structure is a structure wherein data elements are adjacent to each other. Examples of linear data structure include arrays, linked lists, stacks, and queues. On the other hand, a non-linear data structure is a structure wherein each data element can connect to more than two adjacent data elements. Examples of nonlinear data structure include trees and graphs.

15) What is an AVL. Tree?

Answer - An AVL tree is a type of binary search tree that is always in a state of partially balanced. The balance is measured as a difference between the heights of the subtrees from the root. This seil- balancing tree was known to be the first data structure to be designed as such.

16) What are doubly linked lists?

Answer - Doubly linked lists are a special type of linked list wherein traversal across the data elements can be done in both directions. This is made possible by having two links in every node, one that links to the next node and another one that connects to the previous node.

17) What is Huffman's algorithm?

Answer - Huffman's algorithm is used for creating extended binary trees that have minimum weighted path lengths from the given weights. It makes use of a table that contains the frequency of occurrence for each data element.

18) What is Fibonacci search?

Answer - Fibonacci search is a search algorithm that applies to a sorted array, It makes use of a divide- and-conquer approach that can significantly reduce the time needed in order to reach the target element.

19) Briefly explain recursive algorithm.

Answer - Recursive algorithm targets a problem by dividing it into smaller, manageable sub-problems. The output of one recursion after processing one sub-problem becomes the input to the next recursive process.

20) How do you search for a target key in a linked list?

Answer - To find the target key in a linked list, you have to apply sequential search. Each node is traversed and compared with the target key, and if it is different, then it follows the link to t next node. This traversal continues until either the target key is found or if the last node is reached .