Cheatography

Programming Interview Live Coding Cheat Sheet

by nirintsoa via cheatography.com/194635/cs/40859/

Data Structures

Array	An array is a data structure that collects elements of the same data type and stores them in contiguous memory locations.
String	A string (or string literal) is an array of characters (i.e. any combination of numbers, letters, symbols).
Linked List	A Linked List is a user-defined data structure that consists of nodes that point to either in one direction (singly Linked List) or both directions (doubly Linked List).

Linear Data Structures

Stack	The linear data structure stores the data elements in the LIFO or the ‘last-in/ first out’ order.
Queue	The queue is a linear data structure that follows the FIFO order. FIFO stands for First In and First Out.
Linked List	The last node of a data structure will be linked to the first node of the next data structure.

Non-Linear Data Structures

Tree	Tree data structures are hierarchic. The tree data structure collects the nodes together to depict and stimulate the sequence. Tree data structure does not store the data sequentially. It stores the data on multiple levels.
Graph	In Graph Data Structure, one node is simply connected to the other node through the edge of the graph. The Graph Data Structure obviously uses Non-linear data structures which are not sequentially arranged.

Algorithm

Recursion	While technically not an algorithm, recursion is an algorithm technique used to help break down an algorithm into a base case and recursive cases. While these algorithms can also be implemented using loops, they tend to be more readable.
Sorting and searching	Sorting and searching are two fundamental operations that are performed on most data structures. Sorting serves to order elements in a particular way, while searching deals with finding the desired element in a particular data structure.

Sorting Algorithms

Algorithm	Time complexity	Space complexity
Selection sort	O(n²)	O(1)
Insertion sort	O(n²)	O(1)
Counting sort	O(n + k)	O(k)
Quicksort	O(nlogn)	O(logn)
Mergesort	O(nlogn)	O(n)

Searching Algorithms

Algorithm	Time complexity	Space complexity
Linear Search	O(n)	O(1)
Binary Search	O(logn)	O(1) iterative-O(logn) recursive
AVL Binary Search Tree	O(logn)	O(n)

Searching Algorithms (cont)

BFS and DFS	O(V + E), where V is the number of vertices and E is the number of edges	O(V)

Stack Methods

push	Adds a new element at the top of the stack
pop	Removes an element at the top of the stack

Queue Methods

insert	Inserts an element at the end of the queue
delete	Removes an element at the top of the queue
toa	Gets the time required to retrieve an element in the queue

Binary Tree in Array (1-based)

Item	Index
root	1
left child	2n
right child	2n+1
parent	n/2

Binary Tree in Array (0-based)

Item	Index
root	0
left child	2r+1
right child	2r+2
parent	(r-1)/2