Data Structures and Algorithms

University Computer Science · Vocabulary in context

Word	Example
data structures and algorithms	Good **data structures and algorithms** make programs fast.
Big-O /bɪg əʊ/	Linear search is **Big-O** of n: the time grows with the length of the list. n
Big-Θ	**Big-Θ** gives the exact growth rate, such as $\Theta(n^2)$. $\Theta(n^2)$
array /əˈreɪ/	An **array** stores many values under one name.
linked list /lɪŋkt lɪst/	In a **linked list**, each item points to the next one.
node /nəʊd/	Each **node** holds a value and a pointer.
stack /stæk/	The last item put on the **stack** is the first one taken off.
queue /kjuː/	A **queue** is first in, first out.
hash function /hæʃˈfʌŋkʃn/	A **hash function** turns a key into a position in the table.
collision /kəˈlɪʒn/	A **collision** happens when two computers send at the same time.
chaining /ˈtʃeɪnɪŋ/	With **chaining**, each slot in the hash table holds a list of keys.
open addressing	With **open addressing**, a key that collides moves to the next free slot.

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load factor /ləʊd 'fæktə/	The **load factor** is the number of keys divided by the number of slots.
clustering	**Clustering** happens when many keys pile up in neighbouring slots.
binary search tree /'baɪnəri sɜːtʃ triː/	In a **binary search tree**, smaller values go left and bigger values go right.
heap /hiːp/	malloc() takes memory from the **heap**.
	malloc()
min-heap	In a **min-heap**, the smallest value is always at the top.
adjacency list /ə'dʒeɪsənsi lɪst/	An **adjacency list** stores each node with a list of its neighbours.
adjacency matrix	An **adjacency matrix** is a table of 0s and 1s showing which nodes are joined.
	0 1
inversion /ɪn'vɜːʃn/	In [3, 1], the pair (3, 1) is an **inversion**: the order is wrong.
	[3, 1] (3, 1)
insertion sort /ɪn'sɜːʃn sɔːt/	**Insertion sort** puts each new item in the right place.
merge sort /mɜːdʒ sɔːt/	**Merge sort** splits the list in half, sorts each half and joins them.
linear search /'lɪnɪə sɜːtʃ/	A **linear search** checks each item one by one.
binary search /'baɪnəri sɜːtʃ/	**Binary search** halves the list each time.

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