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Topic :Algorithm Analysis and Stack DS

Functions that often appear in algorithm analysis:

Constant ≈ 1
Logarithmic ≈ log n
Linear ≈ n
N-Log-N ≈ n log n
Quadratic ≈ n^2
Cubic ≈ n^3
Exponential ≈ 2^n

Algorithm Pseudo-code Example - Finding max element from an array

arrayMax(A,n):
Input: An array A storing n>=1 integers
Output: Maximum element in A
current_max ← A[0]
for i ← to n-1 do
if current_max < A[i] then
current_max ← A[i]
return current_max

The Stack Abstract Data Type

Stacks are the simplest of all data structures, yet they are also among the most important. They

are used in a host of different applications, and as a tool for many more sophisticated data structures and algorithms.

Formally, a stack is an abstract data type (ADT) such that an instance S supports the following two methods:
S.push(e): Add element e to the top of stack S.
S.pop( ): Remove and return the top element from the stack S;
an error occurs if the stack is empty.
Additionally, let us define the following accessor methods for convenience:
S.top( ): Return a reference to the top element of stack S, without
removing it; an error occurs if the stack is empty.
S.is empty( ): Return True if stack S does not contain any elements.
len(S): Return the number of elements in stack S; in Python, we
implement this with the special method len .

END