Deeper Look at Lists

“Static vs Dynamic ArrayList”

Prerequisite: Array

Md. Saidul Hoque Anik
onix.hoque.mist@gmail.com

Analyzing Runtime

The Big O Notation – A Family of algorithms

$$f(x) \in O(g(x))$$

as there exists

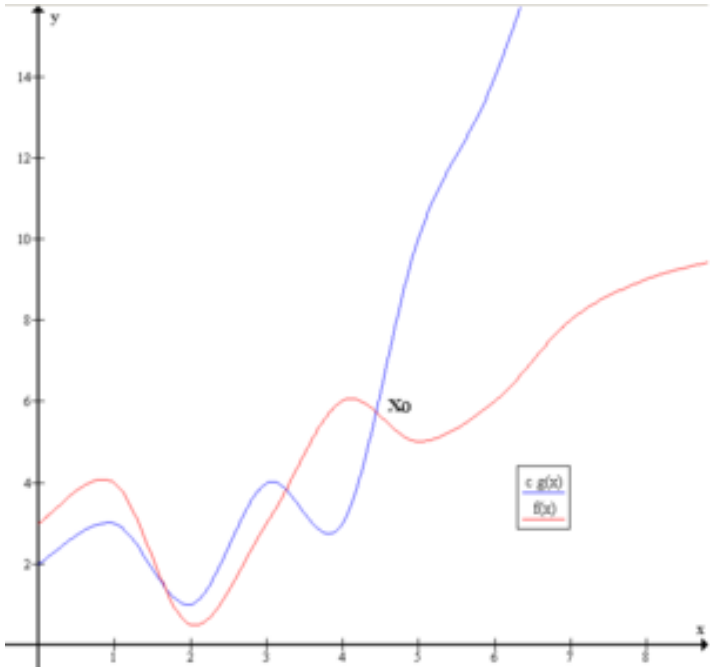
$c > 0$ (e.g., $c = 1$)

&

x_0 (e.g., $x_0 = 5$)

such that

$f(x) \leq cg(x)$ whenever $x \geq x_0$.



Some Common Big O notations

i. $O(1)$
ii. $O(log_2 n)$
iii. $O(n)$
iv. $O(nlog_2 n)$
v. $O(n^2)$
vi. $O(n^3)$

Properties of Static ArrayList

Regular Arrays in C

- Size must be define in compile time
- Continuous memory location
- Homogenous elements
- Zero based indexing
- No bound checking is provided by default
- Fast and simplest Data structure

Properties of Dynamic ArrayList

Custom class (struct) written in C++

- Size can be changed in runtime
- push_back() function is not as fast as static ArrayList
- Homogenous elements
- Zero based indexing

Disadvantage of Dynamic ArrayList

Custom class (struct) written in C++

- Dynamic memory allocation is costly
- Heap may be exhausted
- Memory reallocation might require moving old elements to a new location