Grade 12 Algorithm Speeds List

- With arrays, n represents the size of the array.
- We measure using a mathematical expression because seconds (time) is hardware dependent. We want to analyse algorithms (software) not hardware.
- Bentley's example moral: Fast hardware can not compensate for a bad algorithm.

Speed	Notes about Speed	Algorithms with that Speed
O(1)	Constant Time Very Fast Best!	• Finding length of array, Swap, Add value to array • All Stack Operations (push, peek, pop, isFull, isEmpty, clear) • All Queue Operations (enqueue, dequeue, peek, isEmpty, isFull, clear)
O(log n)	Recursive	• Binary Search • All Binary Search Tree Operations (add, search, delete, min, max)
O(n)	Linear Time One loop through the array	• Linear Search • Min, max, average, sum, print • Bin Sort (grade 11) • Merge (from Mergesort) • Partition (from Quicksort)
Close to O(n)		• Bubblesort (best case, almost sorted)
O(n log n)	Recursive + loop	• Quicksort (slightly faster than Merge) • Mergesort
$O(n^2)$	Quadratic Time Two loops, one nested	• Selection sort (slightly faster than Bubble) • Bubble sort (average case)
$O(n^3)$	Cubic Time Three loops, nested	
O(n!)	Factorial Extremely Slow Worst!	• Bogo Sort (aka Stupid Sort)