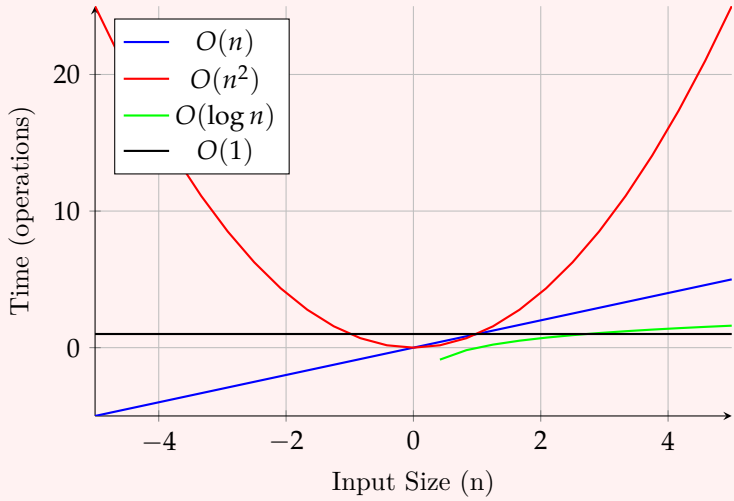
2.1.4 Exercise: Analyze Linear Search

Exercise 2.1. *Implement the linear search algorithm in Python. Analyze its time complexity in both the best and worst cases.*

Example 2.2 : Time Complexity Chart.



2.2 Sorting Algorithms

2.2.1 Theorem: Time Complexity of Sorting Algorithms

Theorem 2.2 : Time Complexity of Bubble Sort . Bubble Sort is an $O(n^2)$ algorithm. In the worst case, Bubble Sort performs $n(n-1)/2$ comparisons.

2.2.2 Proposition: Bubble Sort Efficiency

Proposition 2.3. *In Bubble Sort, each pass through the array pushes the largest unsorted element to its correct position. This results in $O(n^2)$ time complexity, as every element may need to be compared multiple times.*