Introduction to Algorithms and Data Structures

Complexity

Correction

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Exercise 1 - Time Complexity

- 1. O(n)
- 2. O(n²)
- 3. O(1)
- 4. O(log(n))
- 5. O(n log(n))
- 6. O(2ⁿ)
- 7. $O(n^3)$
- 8. O(2ⁿ)
- 9. $O(n^{0.5})$
- 10. O(n²)

Exercise 2 - Space Complexity

- 1. O(1)
- 2. O(n)
- 3. O(n²)
- 4. O(n)
- 5. O(n)
- 6. O(n)
- 7. O(n)
- 8. O(n)
- 9. O(1)
- 10. $O(n^2)$

Exercise 3 - Sorting Algorithm

Array Sorting Algorithms

Algorithm	Time Complexity			Space Complexity
	Best	Average	Worst	Worst
Quicksort	$\Omega(n \log(n))$	Θ(n log(n))	0(n^2)	0(log(n))
<u>Mergesort</u>	$\Omega(n \log(n))$	Θ(n log(n))	0(n log(n))	0(n)
Timsort	<u>Ω(n)</u>	Θ(n log(n))	0(n log(n))	0(n)
<u>Heapsort</u>	$\Omega(n \log(n))$	Θ(n log(n))	0(n log(n))	0(1)
Bubble Sort	<u>Ω(n)</u>	Θ(n^2)	0(n^2)	0(1)
Insertion Sort	<u>Ω(n)</u>	Θ(n^2)	0(n^2)	0(1)
Selection Sort	Ω(n^2)	Θ(n^2)	0(n^2)	0(1)

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