Et bilde som inneholder sort, mørke

KI-generert innhold kan være feil.

Et bilde som inneholder Font, tekst, logo, skjermbilde

KI-generert innhold kan være feil.

Assignment 2

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II.2415 Advanced Algorithmic & Programming

Professor in the course: Dr. NOUBEG

Due: March 12th, 2025

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# Tutorial Course 2

## Part 1

### Algorithm walkthrough

Input -> list of numbers

1. Check that the list is not empty.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 5 | 3 | 1 | 8 | 7 | 2 | 4 |

1. If the list is bigger than one. Then split the list in half.

|  |  |  |  |
| --- | --- | --- | --- |
| 6 | 5 | 3 | 1 |
| 8 | 7 | 2 | 4 |

|  |  |
| --- | --- |
| 8 | 7 |
| 2 | 4 |
| 6 | 5 |
| 3 | 1 |

|  |
| --- |
| 8 |
| 7 |
| 2 |
| 4 |
| 6 |
| 5 |
| 3 |
| 1 |

1. Start with comparing the first value in the list with the first value in another list. Choose the lesser value and add it to a new list. And then we need to consider the following aspects in a loop fashion util the end of one of the lists is reached:
   1. If the current value from the first list has been evaluated as bigger than the last value of the second list, then append the current value from the second list to the new list and append the remaining values of the first list to the new list and return the new list.
   2. Else If the value of the first list is grater than the value of the second list then; append the value of the second list to the new table.
   3. Else move to the next value in the first list and start from step a.

|  |  |
| --- | --- |
| 7 | 8 |

8 > 7 ?

|  |  |
| --- | --- |
| 2 | 4 |

2 > 4 ?

|  |  |
| --- | --- |
| 5 | 6 |

6 > 5 ?

|  |  |
| --- | --- |
| 1 | 3 |

3 > 1 ?

|  |  |
| --- | --- |
| 7 | 8 |

|  |  |
| --- | --- |
| 2 | 4 |

|  |
| --- |
| 2 |
|  |

and 7 > 2 ? (b)

|  |  |
| --- | --- |
| 7 | 8 |

|  |  |
| --- | --- |
| 2 | 4 |

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 4 | 7 | 8 |

and 7 > 4 ? (a)

|  |  |
| --- | --- |
| 5 | 6 |

|  |  |
| --- | --- |
| 1 | 3 |

|  |
| --- |
| 1 |

and 5 > 1 ? (b)

|  |  |
| --- | --- |
| 5 | 6 |

|  |  |
| --- | --- |
| 1 | 3 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 3 | 5 | 6 |

and 5 > 3 ? (a)

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 4 | 7 | 8 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 3 | 5 | 6 |

|  |
| --- |
| 1 |

and 2 > 1 ? (b)

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 4 | 7 | 8 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 3 | 5 | 6 |

|  |  |
| --- | --- |
| 1 | 2 |

and 2 > 3 ? (b), (c)

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 4 | 7 | 8 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 3 | 5 | 6 |

|  |  |  |
| --- | --- | --- |
| 1 | 2 | 3 |

and 4 > 3 ? (b)

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 4 | 7 | 8 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 3 | 5 | 6 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 2 | 3 | 4 |

and 4 > 5 ? (b), (c)

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 4 | 7 | 8 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 3 | 5 | 6 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |

and 7 > 5 ? (b)

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 4 | 7 | 8 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 3 | 5 | 6 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

and 7 > 6 ? (a)

The programmatical representation will therefore look something like this:

Pseudo

# Table of resources

*This list of resources is based on the APA 7th style. The mentioned styled is described on the following website:* [*https://www.kildekompasset.no/en/*](https://www.kildekompasset.no/en/) *(downloaded 01.02.2025)*

Okeke, C. (2023, July 17). *Mastering Big O Notation: Understanding Time and Space Complexity in Algorithms*. Medium. <https://medium.com/@DevChy/introduction-to-big-o-notation-time-and-space-complexity-f747ea5bca58>

Tutorialpoint. (downloaded 2nd of March 2025). *Data Structures - Asymptotic Analysis*. Tutorialpoint. <https://www.tutorialspoint.com/data_structures_algorithms/asymptotic_analysis.htm>

# Last comments

Please review the code in my GitHub repository: <https://github.com/hhamnnes/Assignment1-Advanced-Algorithm-and-programming>