Les 1 huiswerk

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1 Opgave 1

a. Insertion sort:

{6, 0, 9, 3, 0, 5, 7, 3, 1, 5}

{0, 6, 9, 3, 0, 5, 7, 3, 1, 5}

{0, 6, 9, 3, 0, 5, 7, 3, 1, 5}

{0, 3, 6, 9, 0, 5, 7, 3, 1, 5}

{0, 0, 3, 6, 9, 5, 7, 3, 1, 5}

{0, 0, 3, 5, 6, 9, 7, 3, 1, 5}

{0, 0, 3, 5, 6, 7, 9, 3, 1, 5}

{0, 0, 3, 3, 5, 6, 7, 9, 1, 5}

{0, 0, 1, 3, 3, 5, 6, 7, 9, 5}

{0, 0, 1, 3, 3, 5, 5, 6, 7, 9}

b. Shell sort, increments {5, 3, 1}

6	0	9	3	0	5	7	3	1	5
5					6				
	0					7			
		3					9		
			1					3	
				0					5
5	0	3	1	0	6	7	9	3	5
1			5			5			7
	0			0			9		
		3			3			6	
1	0	3	5	0	3	5	9	6	7
0	0	1	3	3	5	5	6	7	9

c. Merge sort:

{6, 0, 9, 3, 0, 5, 7, 3, 1, 5}

{6, 0, 9, 3, 0} {5, 7, 3, 1, 5}

{6, 0} {9, 3, 0} {5, 7} {3, 1, 5}

{6} {0} {9} {3, 0} {5} {7} {3} {1, 5}

{6} {0} {9} {3} {0} {5} {7} {3} {1} {5}

{6} {0} {9} {0, 3} {5} {7} {3} {1, 5}

{0, 6} {0, 3, 9} {5, 7} {1, 3, 5}

{0, 0, 3, 6, 9} {1, 3, 5, 5, 7}

{0, 0, 1, 3, 3, 5, 5, 6, 7, 9}

2   Opgave 2

a. Insertion sort:

{6, 2, 5, 3, 4, 1, 0, 7}

{2, 6, 5, 3, 4, 1, 0, 7}

{2, 5, 6, 3, 4, 1, 0, 7}

{2, 3, 5, 6, 4, 1, 0, 7}

{2, 3, 5, 6, 4, 1, 0, 7}

{2, 3, 4, 5, 6, 1, 0, 7}

{1, 2, 3, 4, 5, 6, 0, 7}

{0, 1, 2, 3, 4, 5, 6, 7}

b. Shell sort, increments {5, 3, 1}

```
6   2   5   3   4   1   0   7
1                   6
    0                   2
        5                   7
            3
                4
1   0   5   3   4   6   2   7
1           2           2
    0               4           7
        5               6
1   0   5   2   4   6   2   7
0   1   2   2   4   5   6   7
```

c. Merge sort:

{6, 2, 5, 3, 4, 1, 0, 7}

{6, 2, 5, 3} {4, 1, 0, 7}

{6, 2} {5, 3} {4, 1} {0, 7}

{6} {2} {5} {3} {4} {1} {0} {7}

{2, 6} {3, 5} {1, 4} {0, 7}

{2, 3, 5, 6} {0, 1, 4, 7}

{0, 1, 2, 3, 4, 5, 6, 7}

3 Opgave 3

1. `next`

2. `NULL`

3. `data`

4. `1`

5. `next`

6. `0`

7. `next`

4 Opgave 4

a. $O(n \log n)$

b. $O(n \log n)$

c. $O(n \log n)$

5 Opgave 5

a. $O(n^2)$

b. $O(n)$

c. $O(n)$