# Assignment 2

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## 1 Table

| | I-sort | Q-sort | H-sort |
|---|---|---|---|
| Best | $\mathcal{O}(n)$ | $\mathcal{O}(nlog(n))$ | $\mathcal{O}(nlog(n))$ |
| Worst | $\mathcal{O}(n^2)$ | $\mathcal{O}(n^2)$ | $\mathcal{O}(nlog(n))$ |
| Average | $\mathcal{O}(n^2)$ | $\mathcal{O}(nlog(n))$ | $\mathcal{O}(nlog(n))$ |

## 2 Insertionsort

Insertion Sort is the function with the better best case of the three with $\mathcal{O}(n)$. But also the worst worst-case together with quick sort, $\mathcal{O}(n^2)$. This means that insertion sort is best if the list already is sorted for small numbers of $n$ i.e. small lists. So for small lists that's known to be poorly sorted insertion sort would be the better option. However, the average case for quick sort is better than insertion sort's so quick sort is often the better option.

## 3 Quicksort

Quick Sort is a divide and conquer method and it has the best- and average case of $\mathcal{O}(nlog(n))$ and a worst case of $\mathcal{O}(n^2)$. The Quick Sort algirithm is at worst case if the array is already sorted och reversely sorted, but it is considered to be the fastest sorting algorithm if the sorting does not have to be stable, and is used in commercial computing among other things.

## 4 Heapsort

The best, avarage and worst case of Heap Sort is $\mathcal{O}(nlog_(n))$, which means that it has a better worst case scenario than the other sorting algorithms in this comparison. It also does not matter what the distribution of data is, unlike the others. That means that if the array, for example, is reversely sorted, Heap Sort wont be affected by this, unlike ex Quick Sort,