# CS2023 - Data Structures and Algorithms

# In-class Lab Exercise - Week 5

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**Question 1**

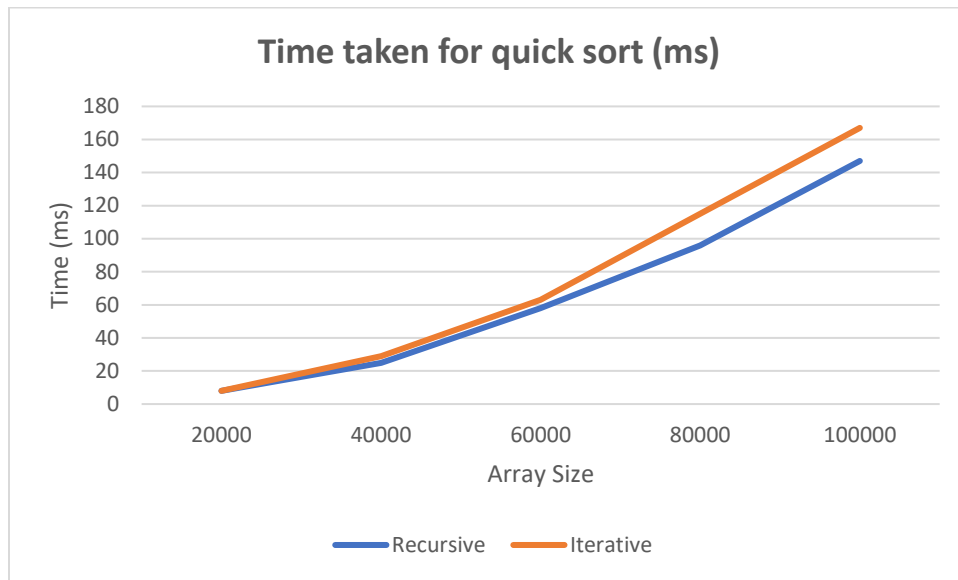**Terminal Outputs**

1.  **Recursive Quick Sort**



2.  **Iterative Quick Sort**



| Array Size | Time taken for quick sort (ms) | |
|---|---|---|
| | Recursive | Iterative |
| 20000 | 8 | 8 |
| 40000 | 25 | 29 |
| 60000 | 58 | 63 |
| 80000 | 96 | 115 |
| 100000 | 147 | 167 |

**Time Graph**

**Time taken for quick sort (ms)**



The recursive and iterative algorithms have taken almost the same amount of time, but the recursive algorithm is slightly faster for higher array sizes.

**Question 2**

```
Enter length of input stream:
7
Enter numbers:
1 6 13 5 2 10 4
Sorted: [1]
Median: 1.0
Sorted: [1, 6]
Median: 3.5
Sorted: [1, 6, 13]
Median: 6.0
Sorted: [1, 5, 6, 13]
Median: 5.5
Sorted: [1, 2, 5, 6, 13]
Median: 5.0
Sorted: [1, 2, 5, 6, 10, 13]
Median: 5.5
Sorted: [1, 2, 4, 5, 6, 10, 13]
Median: 5.0
```

GitHub repository for code: https://github.com/Anuki16/cs2023-data-structures-algorithms