Exercise 3

# Results

Text

Description automatically generated

Note that every array has 10^7 elements

|  |  |  |  |
| --- | --- | --- | --- |
| Algorithm | Random array with range (1-99) | Sorted array with range (1-10^7) | Duplicate array with range (0-2) |
| QuickSort time in ms | 453 | 235 | 276 |
| DualPivot quicksort time in ms | 378 | 169 | 255 |

Dual Pivots modification to avoid O(n^2) when the array is sorted is implemented as shown below

Text

Description automatically generated

# Conclusion

QuickSort lost on all three test cases to DualPivot quicksort. This could be to various factors such as machine architecture, the range for the random numbers among other things. Further tests needed for analyzing both in-depth.

As expected of good algorithms, both algorithms perform better when the array is sorted from before.

Arrays with duplicates are also easier for both algorithms than an array with random numbers.