# Data Structures – CS1353 – Assignment 1

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NOTE – In the code provided, only compile and execute the wrapper.c. Nothing else is necessary.

3 variations of quicksort were implemented – one with the last element of the subarray being chosen as the pivot, one with a random element of the subarray being chosen as the pivot, and one with the median of the first, last and middle elements being chosen as the pivot.

Here are the observed trends in runtime for varying array sizes -

## Array Size (n) = 50

|  |  |
| --- | --- |
| QS\_last | 0.001800ms |
| QS\_random, excluding Random Pivot Generation | 0.002250ms |
| QS\_random, including Random Pivot Generation | 0.004750ms |
| QS\_median | 0.001900ms |

## n = 100

|  |  |
| --- | --- |
| QS\_last | 0.003800ms |
| QS\_random, excluding Random Pivot Generation | 0.004600ms |
| QS\_random, including Random Pivot Generation | 0.007100ms |
| QS\_median | 0.003950ms |

## n = 150

|  |  |
| --- | --- |
| QS\_last | 0.006200ms |
| QS\_random, excluding Random Pivot Generation | 0.007100ms |
| QS\_random, including Random Pivot Generation | 0.009600ms |
| QS\_median | 0.006050ms |

## n = 200

|  |  |
| --- | --- |
| QS\_last | 0.008200ms |
| QS\_random, excluding Random Pivot Generation | 0.010250ms |
| QS\_random, including Random Pivot Generation | 0.012750ms |
| QS\_median | 0.008050ms |

## n = 250

|  |  |
| --- | --- |
| QS\_last | 0.010550ms |
| QS\_random, excluding Random Pivot Generation | 0.012600ms |
| QS\_random, including Random Pivot Generation | 0.016600ms |
| QS\_median | 0.010000ms |