# Mean multi-threading

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of Threads | 1 | 2 | 4 | 8 | 16 | 32 | 64 | 128 | 512 | 1024 | 2048 |
| Execution time (ms) | 22 | 25 | 30 | 34 | 41 | 50 | 60 | 73 | 177 | 233 | 339 |
| Mean values | 5002.432 | 5002.435 | 5002.419 | 5002.416 | 5002.439 | 5002.469 | 5002.486 | 5002.413 | 5002.284 | 5002.327 | 5002.133 |

# Median multi-threading

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of Threads | 1 | 2 | 4 | 8 | 16 | 32 | 64 | 128 | 512 | 1024 | 2048 |
| Execution time (ms) | 602 | 628 | 720 | 936 | 942 | 1034 | 997 | 956 | 1021 | 1266 | 1287 |
| Median values | 5006.0 | 5006.0 | 5006.0 | 5006.0 | 5006.0 | 5006.0 | 5006.0 | 5006.0 | 5006.0 | 5006.0 | 5006.0 |

# Discussion

As we can see from both plots, there is a general trend where the execution time increases with the number of threads used. Theoretically, threading should help to speed up the process, however, this does not appear to be the case observed. One possible reason is that the time taken to obtain the mean or sort the arrays of each thread is not that long, as a result, threading does not improve the timing enough to compensate the overhead of creating the threads.