

## Assignment 2: Coin Counter

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The strategy used was the Fork/Join framework because the algorithm provided is recursive, so it is possible to divide the set of coins into smaller parts and create sub-tasks to compute those same parts. Regarding the granularity of the task, I tested the execution times with `index ≥ 15` and `getQueuedTaskCount() > 2` and was able to conclude that with `index ≥ 15` the execution is faster. The best result I got was  $\approx 0.082$  seconds with 24 threads.

Execution time of each iteration with `coins.length=30` and `LIMIT=999`

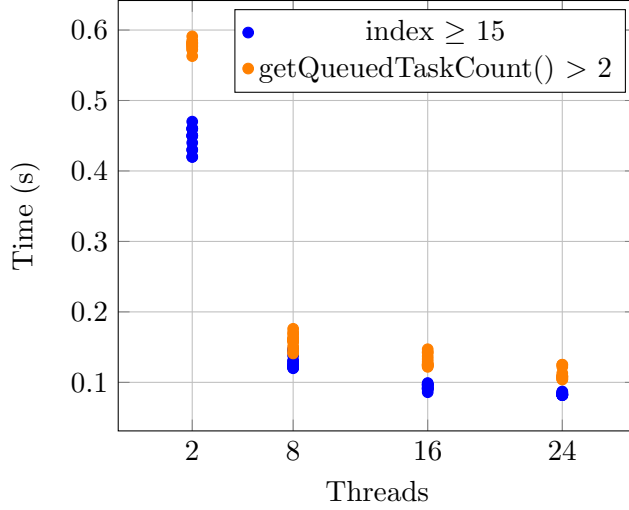


Figure 1: Parallel

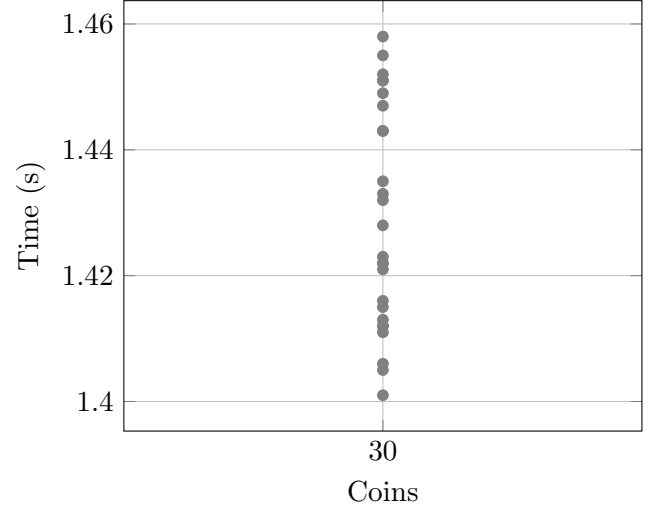


Figure 2: Sequential

$$SpeedUp = \frac{\overline{Sequential}}{\overline{Parallel}} = \frac{1.44s}{0.085s} \approx 17$$

$$Occupancy = \frac{Speedup}{\#Cores} = \frac{17}{24} \approx 0.71$$

## Hardware details

CPU	Cores	Threads	RAM	Operating System	Java
Intel Core i7-13700	16	24	32GB 6000MHz	Windows 11	21