# Concurrent Scientific Computing

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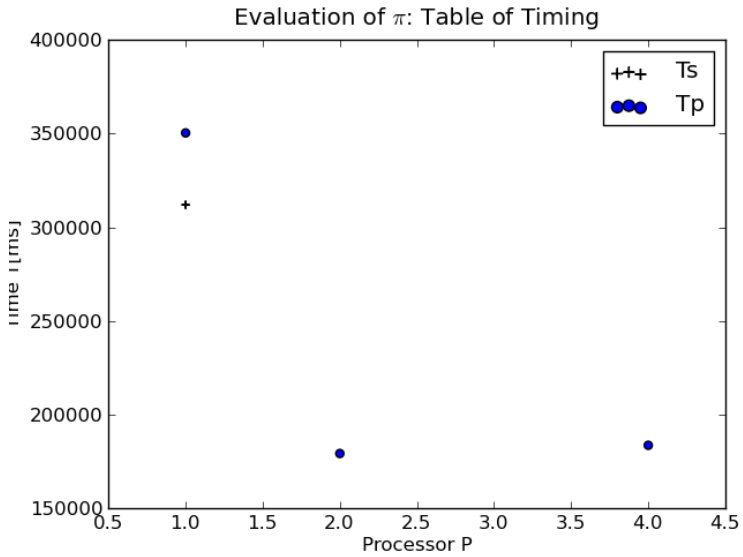
## Exercise 4:

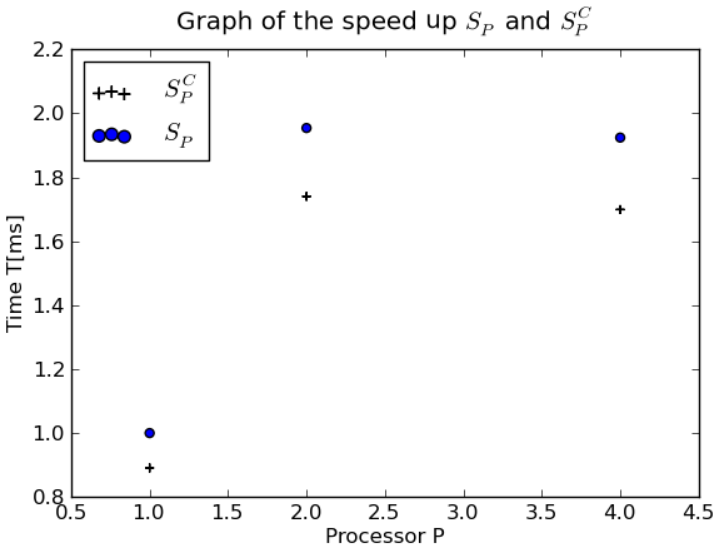
Using $N = 5 \times 10^7$ subdivisions of the interval [0,1], these are the timing
Sequential (1P): 5m12.060s
Concurrent (1P): 5m50.396s
Concurrent (2P): 2m59.318s
Concurrent (4P): 3m03.697s

That leads us to the following table

| P | $T_P$[ms] | $S_P$ | $S_P^C$ |
|---|---|---|---|
| S | 312060.0 | . | . |
| 1 | 350396.0 | 1.0 | 0.891 |
| 2 | 179318.0 | 1.954 | 1.740 |
| 4 | 183697.0 | 1.924 | 1.699 |

Finally we have the plots






## Exercise 6: Inner Product

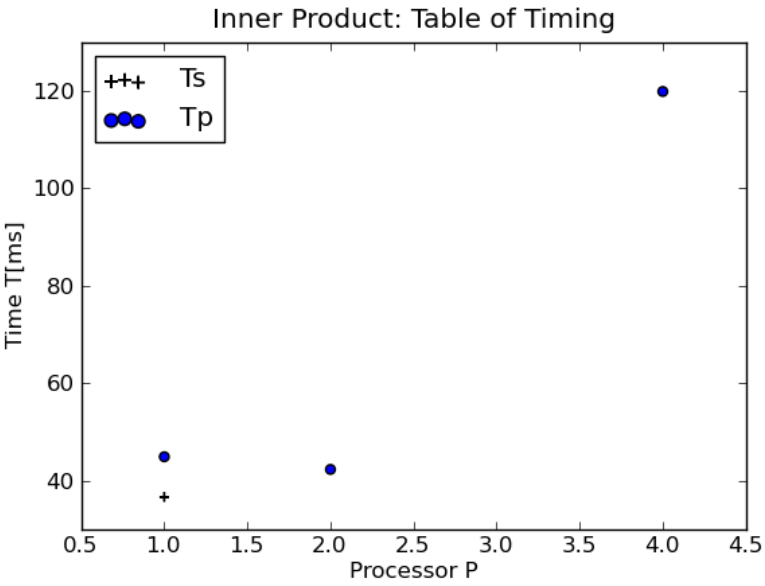
These are the timing of the program which computes the dot product, using vectors of size 10000.

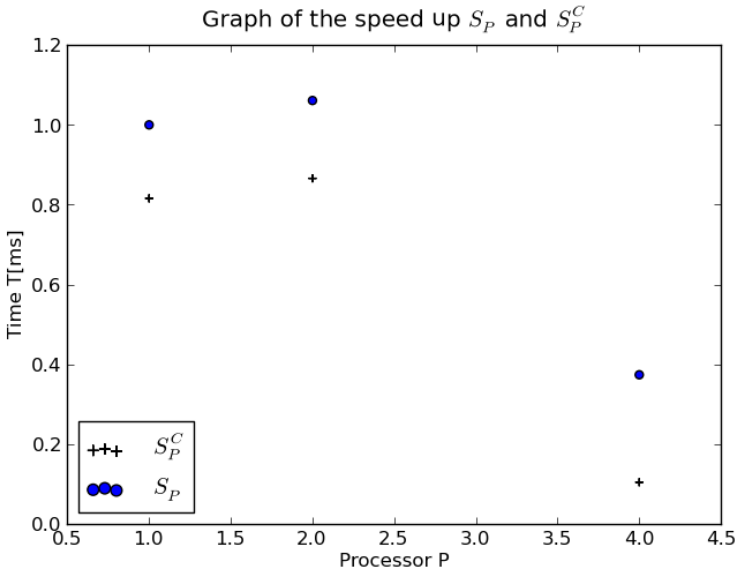
| | |
|---|---|
| Sequential (1P): | 36.615s |
| Concurrent (1P): | 44.861s |
| Concurrent (2P): | 42.263s |
| Concurrent (4P): | 119.875s |

That leads us to the following table.

| P | $T_P$[ms] | $S_P$ | $S_P^C$ |
|---|---|---|---|
| S | 36.615 | . | . |
| 1 | 44.861 | 1.0 | 0.816 |
| 2 | 42.263 | 1.061 | 0.866 |
| 4 | 119.875 | 0.374 | 0.105 |

Finally we have the plots


Inner Product: Table of Timing
Ts
Tp
Time T[ms]
Processor P
120
100
80
60
40
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5


Graph of the speed up $S_P$ and $S_P^C$
$S_P^C$
$S_P$
Time T[ms]
Processor P
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5