# Exercise 3

|  |  |
| --- | --- |
| INPUT | EXECUTION TIME |
| 10,000,000 | 922ms |
| 20,000,000 | 2037ms |
| 30,000,000 | 2963ms |
| 40,000,000 | 4059ms |
| 50,000,000 | 5148ms |
| 80,000,000 | 8223ms |
| 100,000,000 | 10705ms |
| 110,000,000 | 11658ms |
| 120,000,000 | 12822ms |
| 130,000,000 | 13995ms |
| 140,000,000 | 15210ms |
| 150,000,000 | 16332ms |
| 200,000,000 | 22501ms,22485ms,21669ms |
|  |  |

1. With a Processor of 11th Gen Intel(R) Core(TM) i7-11800H @ 2.30GHz, 2304 Mhz, 8 Core(s), 16 Logical Processor(s) The above table describes the execution time of the sequential program against some test inputs ranging from 10,000,000 to 200,000,000 inclusive.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| INPUT | MINSIZE=1000000 | MINSIZE=2000000 | 5000000 | 10000000 |
| 10,000,000 | 309ms | 484ms | 700ms | 1243 |
| 20,000,000 | 502ms | 673ms | 1106ms | 1842ms |
| 30,000,000 | 796ms | 906ms | 1200ms | 1923ms |
| 40,000,000 | 993ms | 995ms | 1300ms | 1062ms |
| 50,000,000 | 1194ms | 1217ms | 1450ms | 2533ms |
| 80,000,000 | 1787ms | 1805ms | 2222ms | 3203ms |
| 100,000,000 | 2531ms | 2310ms | 2810ms | 3323ms |
| 110,000,000 | 2689ms | 2520ms | 3128ms | 3656ms |
| 120,000,000 | 2652ms | 2763ms | 3184ms | 3711ms |
| 130,000,000 | 3041ms | 3076ms | 3533ms | 4384ms |
| 140,000,000 | 3074ms | 3380ms | 3471ms | 4236ms |
| 150,000,000 | 3881ms | 3543ms | 4130ms | 4696ms |
| 200,000,000 | 4933ms,4748s | 4645ms,4532ms | 4784ms,4807ms | 6244ms,5471ms |

**b.**

**i.** With MINSIZE of 1000000 the execution time of the parallelized program with input of 200000000 is 4933ms and for the sequential of the same input size is 22501

Hence, the speed up is 22501ms/4933ms = 4.561ms

**ii.**  MINSIZE of 2000000 , input = 200000000 the parallel program is 4645ms and for the sequential is 22501 hence the speed up is 4.844ms

**iii.** MINSIZE of 5000000 , input = 200000000 the parallel program is 4784ms and for the sequential is 22501 hence the speed up is 4.70ms

**iv.** MINSIZE of 10000000 , input = 200000000 the parallel program is 6244ms and for the sequential is 22501 hence the speed up is 3.60ms

With this result of speed up, One can say that the speed up gets better with less threads and this is due to the result obtained from comparison of the results.