

Trabalho Prático II
Arquitetura de Computadores
Prof. Juan Colonna
Aluno: Marcos Guerreiro Rebelo

Relatório Final

Observação geral:

Figura 1: Informações sobre a arquitetura utilizada visualizada no Hardinf.

Package Information

Intel(R) Core(TM) i3-8130U CPU @ 2.20GHz 0:0 0 3400,00 MHz

Intel(R) Core(TM) i3-8130U CPU @ 2.20GHz 0:1 1 3400,00 MHz

Intel(R) Core(TM) i3-8130U CPU @ 2.20GHz 0:0 2 3400,00 MHz

Intel(R) Core(TM) i3-8130U CPU @ 2.20GHz 0:1 3 3400,00 MHz

Package Information

Name

Intel(R) Core(TM) i3-8130U CPU @ 2.20GHz

Topology

1 physical processor; 2 cores; 4 threads

Logical CPU Config

4x 3400,00 MHz

Clocks

400,00-3400,00 MHz

4x

Caches

Level 1 (Data)

2x 32KB (64KB), 8-way set-associative, 64 sets

Level 1 (Instruction)

2x 32KB (64KB), 8-way set-associative, 64 sets

Level 2 (Unified)

2x 256KB (512KB), 4-way set-associative, 1024 sets

Level 3 (Unified)

1x 4096KB (4096KB), 16-way set-associative, 4096 sets

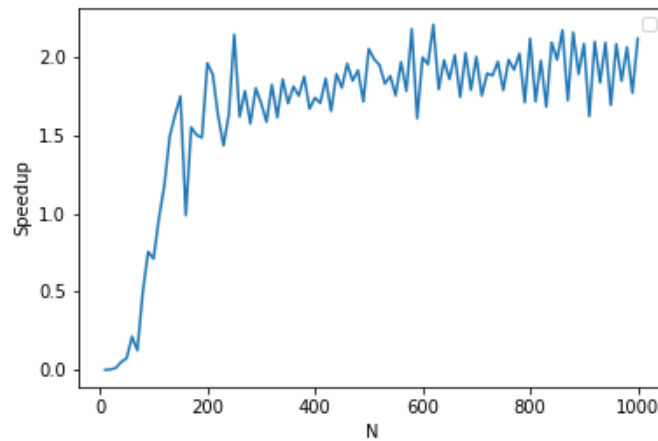
a) Tabela com os seguintes dados:

| Tamanho Matriz | Média Sequencial | Média Distribuída | Speedup |
|----------------|------------------|-------------------|--------------------|
| 1 | 5.7051e-06 | 0.0152683 | 0,0000003736565302 |
| 2 | 3.77462e-05 | 0.0123392 | 0,00003059047588 |
| 3 | 0.000174517 | 0.0133587 | 1,306392089 |
| 4 | 0.000369194 | 0.00731036 | 0,5050284801 |
| 5 | 0.00113752 | 0.0151626 | 0,7502143432 |
| 6 | 0.00154085 | 0.00722913 | 0,2131445969 |
| 7 | 0.00343355 | 0.0274229 | 1,252073997 |
| 8 | 0.00729538 | 0.0146533 | 4,978660097 |
| 9 | 0.00822909 | 0.010891 | 75,55862639 |
| 10 | 0.0163247 | 0.0229717 | 0,7106439663 |
| 11 | 0.0196885 | 0.020295 | 9,701157921 |
| 12 | 0.0103298 | 0.00877195 | 0,1177594492 |
| 13 | 0.0297265 | 0.0199099 | 1,493051196 |
| 14 | 0.032929 | 0.0202102 | 0,1629325786 |
| 15 | 0.0452633 | 0.0258492 | 1,751052257 |
| 16 | 0.045442 | 0.0459711 | 0,09884905952 |
| 17 | 0.040834 | 0.0263208 | 0,1551396614 |
| 18 | 0.0385063 | 0.0256247 | 1,502702471 |
| 19 | 0.046206 | 0.0310951 | 0,1485957595 |
| 20 | 0.0717202 | 0.0365355 | 1,96302774 |
| 21 | 0.0726488 | 0.0384305 | 1,890394348 |
| 22 | 0.101267 | 0.0622945 | 0,1625617029 |
| 23 | 0.0697142 | 0.0485705 | 1,435319793 |
| 24 | 0.0673958 | 0.0411874 | 1,636320817 |
| 25 | 0.0719861 | 0.0335595 | 2,145028978 |
| 26 | 0.0831133 | 0.0512954 | 1,620287589 |
| 27 | 0.0829333 | 0.0464793 | 1,784306132 |
| 28 | 0.131365 | 0.0833583 | 0,1575907858 |
| 29 | 0.153255 | 0.0850331 | 0,1802298164 |
| 30 | 0.106753 | 0.0625724 | 0,1706071687 |
| 31 | 0.151838 | 0.0956949 | 0,1586688528 |
| 32 | 0.189859 | 0.104075 | 1,824251742 |
| 33 | 0.202381 | 0.125333 | 1,614746316 |
| 34 | 0.230307 | 0.123946 | 1,858123699 |
| 35 | 0.315369 | 0.184901 | 1,705610029 |
| 36 | 0.263156 | 0.145214 | 1,812194417 |
| 37 | 0.293536 | 0.167419 | 1,753301597 |
| 38 | 0.31851 | 0.169747 | 0,1876380731 |
| 39 | 0.255652 | 0.153057 | 1,670305834 |
| 40 | 0.34111 | 0.195925 | 0,1741023351 |
| 41 | 0.354304 | 0.207534 | 1,707209421 |
| 42 | 0.471138 | 0.252765 | 1,863936858 |
| 43 | 0.460771 | 0.278143 | 1,656597506 |
| 44 | 0.441194 | 0.233143 | 1,892375066 |
| 45 | 0.543565 | 0.301167 | 1,804862419 |

| | | | |
|----|----------|----------|---------------|
| 46 | 0.578095 | 0.295052 | 1,9592987 |
| 47 | 0.536689 | 0.290206 | 1,849338056 |
| 48 | 0.634415 | 0.331039 | 1,916435828 |
| 49 | 0.65071 | 0.378977 | 0,1717017128 |
| 50 | 0.704863 | 0.343133 | 2,054197643 |
| 51 | 0.747262 | 0.375959 | 1,987615671 |
| 52 | 0.737676 | 0.378126 | 1,950873518 |
| 53 | 0.698274 | 0.381349 | 1,831062885 |
| 54 | 0.898158 | 0.477711 | 1,880128362 |
| 55 | 0.952884 | 0.542844 | 1,75535513 |
| 56 | 0.843102 | 0.428078 | 1,969505557 |
| 57 | 1.2325 | 0.690915 | 0,2246730785 |
| 58 | 1.37146 | 0.628685 | 0,2181474029 |
| 59 | 1.12484 | 0.699094 | 0,1608996787 |
| 60 | 1.33207 | 0.666293 | 0,1999225566 |
| 61 | 1.12698 | 0.576586 | 0,1954573992 |
| 62 | 1.42455 | 0.644948 | 0,2208782724 |
| 63 | 1.45899 | 0.813 | 179,4575646 |
| 64 | 1.56663 | 0.790981 | 0,1980616475 |
| 65 | 1.81174 | 0.97399 | 1,860121767 |
| 66 | 2.11853 | 1.05162 | 2,014539472 |
| 67 | 2.04904 | 1.17388 | 1,745527652 |
| 68 | 2.23185 | 1.10105 | 2,027019663 |
| 69 | 2.01393 | 1.1244 | -0,8405489217 |
| 70 | 2.64862 | 1.32277 | 2,002328447 |
| 71 | 2.3235 | 1.32432 | 3,682131207 |
| 72 | 2.67614 | 1.41128 | 1,896250213 |
| 73 | 2.3792 | 1.26329 | 5,470414552 |
| 74 | 2.99148 | 1.51792 | 1,970775798 |
| 75 | 2.76323 | 1.54451 | 1,789065788 |
| 76 | 3.11744 | 1.57103 | 1,984328752 |
| 77 | 2.7205 | 1.41645 | 13,67958629 |
| 78 | 3.57514 | 1.76717 | 2,023087762 |
| 79 | 2.99263 | 1.74898 | 1,711071596 |
| 80 | 4.06736 | 1.91845 | 2,120128229 |
| 81 | 3.74282 | 2.18006 | 1,716842656 |
| 82 | 3.74136 | 1.89119 | 1,978309953 |
| 83 | 4.1486 | 2.46553 | -0,6129229821 |
| 84 | 3.90944 | 1.86598 | 2,09511356 |
| 85 | 3.27005 | 1.64838 | 1,983796212 |
| 86 | 3.57722 | 1.64646 | 2,172673493 |
| 87 | 3.04633 | 1.76679 | 1,724217366 |
| 88 | 3.81592 | 1.76814 | 2,158154897 |
| 89 | 3.49357 | 1.8466 | 0,1456755838 |
| 90 | 4.48294 | 2.14907 | 2,085990684 |
| 91 | 4.26143 | 2.62552 | 1,62308038 |

| | | | |
|-----|---------|---------|--------------|
| 92 | 4.3292 | 2.06127 | 2,466979095 |
| 93 | 3.98424 | 2.16871 | 1,837147429 |
| 94 | 5.11937 | 2.4453 | 0,5489952793 |
| 95 | 3.80531 | 2.24598 | 1,694275995 |
| 96 | 4.87719 | 2.34056 | 2,083770551 |
| 97 | 4.41265 | 2.38779 | 1,848005897 |
| 98 | 5.24022 | 2.53901 | 2,063883167 |
| 99 | 4.93765 | 2.78652 | 1,771977233 |
| 100 | 6.07349 | 2.8652 | 0,246274152 |

c) Figura 2: Gráfico referente $N \times \text{Speedup}$



d) Conclusão

Com relação ao experimento do problema de paralelismo de threads comparando as abordagens sequenciais e distribuídas, no gráfico pode-se notar uma grande diferença e variações no desempenho relativo dos problemas devido aos intervalos de tamanhos da matriz propostos e as configurações mediana da arquitetura utilizada.