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PRINTS DE EXECUÇÃO:

```
PS C:\Users\tomyb\OneDrive\Documentos\Paralelo\output> & .\'ordemLinha.exe'

Tempo levado (Ordem Linha): 0.003000 segundos
```

```
PS C:\Users\tomyb\OneDrive\Documentos\Paralelo\output> & .\'ordemColuna.exe'

Tempo levado (Ordem Coluna): 0.004000 segundos
```

```
PS C:\Users\tomyb\OneDrive\Documentos\Paralelo\output> & .\'blocagemMatriz.exe'

Tempo Levado(Blocagem): 0.003000 segundos
```

VALGRIND:

```
passwd@DESKTOP-3IH3RPT:~$ valgrind --tool=cachegrind ./ordemLinha
==73326== Cachegrind, a cache and branch-prediction profiler
==73326== Copyright (C) 2002-2017, and GNU GPL'd, by Nicholas Nethercote et al.
==73326== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==73326== Command: ./ordemLinha
==73326==
--73326-- warning: L3 cache found, using its data for the LL simulation.
--73326-- warning: specified LL cache: line_size 64  assoc 16  total_size 12,582,912
--73326-- warning: simulated LL cache: line_size 64  assoc 24  total_size 12,582,912

Tempo levado (Ordem Linha): 0.219152 segundos==73326==
==73326== I   refs:      63,237,855
==73326== I1  misses:         1,453
==73326== LLi misses:         1,429
==73326== I1  miss rate:       0.00%
==73326== LLi miss rate:       0.00%
==73326==
==73326== D   refs:      18,771,363  (17,576,889 rd   + 1,194,474 wr)
==73326== D1  misses:         4,796  (     2,273 rd   +     2,523 wr)
==73326== LLd misses:         3,721  (     1,360 rd   +     2,361 wr)
==73326== D1  miss rate:        0.0% (       0.0%     +       0.2%  )
==73326== LLd miss rate:        0.0% (       0.0%     +       0.2%  )
==73326==
==73326== LL refs:            6,249  (     3,726 rd   +     2,523 wr)
==73326== LL misses:          5,150  (     2,789 rd   +     2,361 wr)
==73326== LL miss rate:         0.0% (       0.0%     +       0.2%  )
```

```
passwd@DESKTOP-3IH3RPT:~$ valgrind --tool=cachegrind ./ordemColuna
==74202== Cachegrind, a cache and branch-prediction profiler
==74202== Copyright (C) 2002-2017, and GNU GPL'd, by Nicholas Nethercote et al.
==74202== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==74202== Command: ./ordemColuna
==74202==
--74202-- warning: L3 cache found, using its data for the LL simulation.
--74202-- warning: specified LL cache: line_size 64  assoc 16  total_size 12,582,912
--74202-- warning: simulated LL cache: line_size 64  assoc 24  total_size 12,582,912

Tempo levado (Ordem Coluna): 0.197579 segundos==74202==
==74202== I   refs:      63,237,926
==74202== I1  misses:         1,454
==74202== LLi misses:         1,430
==74202== I1  miss rate:       0.00%
==74202== LLi miss rate:       0.00%
==74202==
==74202== D   refs:      18,771,384  (17,576,904 rd   + 1,194,480 wr)
==74202== D1  misses:         4,797  (     2,274 rd   +     2,523 wr)
==74202== LLd misses:         3,721  (     1,360 rd   +     2,361 wr)
==74202== D1  miss rate:        0.0% (       0.0%     +       0.2%  )
==74202== LLd miss rate:        0.0% (       0.0%     +       0.2%  )
==74202==
==74202== LL refs:            6,251  (     3,728 rd   +     2,523 wr)
==74202== LL misses:          5,151  (     2,790 rd   +     2,361 wr)
==74202== LL miss rate:         0.0% (       0.0%     +       0.2%  )
```

```
passwd@DESKTOP-3IH3RPT:~$ valgrind --tool=cachegrind ./blocagemMatriz
==74436== Cachegrind, a cache and branch-prediction profiler
==74436== Copyright (C) 2002-2017, and GNU GPL'd, by Nicholas Nethercote et al.
==74436== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==74436== Command: ./blocagemMatriz
==74436==
--74436-- warning: L3 cache found, using its data for the LL simulation.
--74436-- warning: specified LL cache: line_size 64  assoc 16  total_size 12,582,912
--74436-- warning: simulated LL cache: line_size 64  assoc 24  total_size 12,582,912

Tempo Levado(Blocagem): 0.206422 segundos==74436==
==74436== I   refs:      67,672,100
==74436== I1  misses:         1,461
==74436== LLi misses:         1,433
==74436== I1  miss rate:       0.00%
==74436== LLi miss rate:       0.00%
==74436==
==74436== D   refs:      21,074,866  (19,818,748 rd   + 1,256,118 wr)
==74436== D1  misses:         7,683  (     5,185 rd   +     2,498 wr)
==74436== LLd misses:         3,726  (     1,365 rd   +     2,361 wr)
==74436== D1  miss rate:        0.0% (       0.0%     +       0.2%  )
==74436== LLd miss rate:        0.0% (       0.0%     +       0.2%  )
==74436==
==74436== LL refs:            9,144  (     6,646 rd   +     2,498 wr)
==74436== LL misses:          5,159  (     2,798 rd   +     2,361 wr)
==74436== LL miss rate:         0.0% (       0.0%     +       0.2%  )
```

Análise:

A multiplicação com blocagem mostrou um desempenho melhor em termos de eficiência de cache, com uma taxa de falha no cache de dados de primeiro nível (D1), o que indica um acesso mais eficiente à memória. O tempo de execução com blocagem foi um pouco maior, mas isso é esperado em matrizes menores devido ao controle extra dos blocos. Em matrizes maiores, a tendência é que a blocagem traga ganhos mais expressivos, já que o melhor uso do cache tende a compensar qualquer sobrecarga inicial.