Course Notes

High Performance Computing

Part 1

Errata-Corrige

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In the code:

```
parallel        distribution, collection, worker[n]; int A[M][M], B[M], C[M];
                param g = M/n;
worker[i] ::    int A[i*g .. (i+1)*g-1][*], B[[*], C[i*g .. (i+1)*g-1];
                for (j = 0; j < M; j++)
                        C[i] = C[i] + A[i][j] * B[j]
```

the loop must be modified in order to compute all the *g* elements of the C partition.

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In the code:

```
parallel        VP[M]; int A[M][M], B[M], C[M]; channel stencil [M];
VP[i] :: int A[i][*], B[i], C[i]; int x;
                channel in stencil [i] (1), channel out stencil [(i+1) mod M];
                for (j = 0; j < M; j++)
                        { send (stencil [(i+1) mod M], B[i]);
                          receive (stencil [i], B[i]);
                          C[i] = C[i] + A[i][j] * B[i] }
```

the indexes of A must be modified parametrically in order to multiply the corresponding values of A and B, according to the B value received.

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The sequential code of convolution must be replaced by the following:

```
int A[M][M], old_A[M][M]; init old_A = A;
repeat
        { ∀i = 0 .. M − 1:
                ∀j = 0 .. M − 1:
                        { A[i, j] = F (old_A[i, j] , old_A[i − 1, j] , old_A[i + 1, j] ,
                                       old_A[i, j − 1] , old_A[i, j + 1] );
          old_A = A // to be implemented by a double loop //
        }
until convergence (A)
```

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The formula in the last line must be replaced by the following:

$$T_{gather} \sim T_{send}(g)$$

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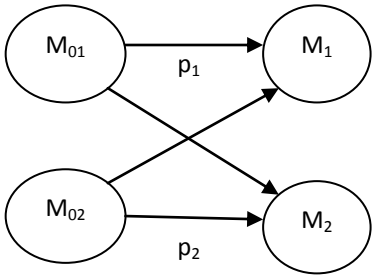
The figure of Exercise 7 is:



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Line 2:

VP[i] encapsulates V[i] and …

Line 14:

$lg_2 n\ (T_G + T_{send}(1)) \sim 6\ 10^3\ \tau$

Line 15:

.. from W_{n-1} …

Line 23:

$T_{multicast} = 2\ T_{send}(M2) = 2\ 10^7\ t < T_s$

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Line 3 of point c):

… method of Part 1, Section 8 …

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Last line:

… See Section 13.8 for …

3. a LOAD instruction, belonging to the same long instruction of an instruction *inducing a* logical dependency, does not belong to the critical sequence;