Computação em Larga Escala

Assignment 3 – Algorithmic analysis

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Summary

- *Mapping a thread to a subsequence*
- *Row processing*
- *Column processing*

Mapping a thread to a subsequence - 1

$x = threadIdx.x + blockDim.x * blockIdx.x$

$y = threadIdx.y + blockDim.y * blockIdx.y$

$idx = blockDim.x * gridDim.x * y + x$

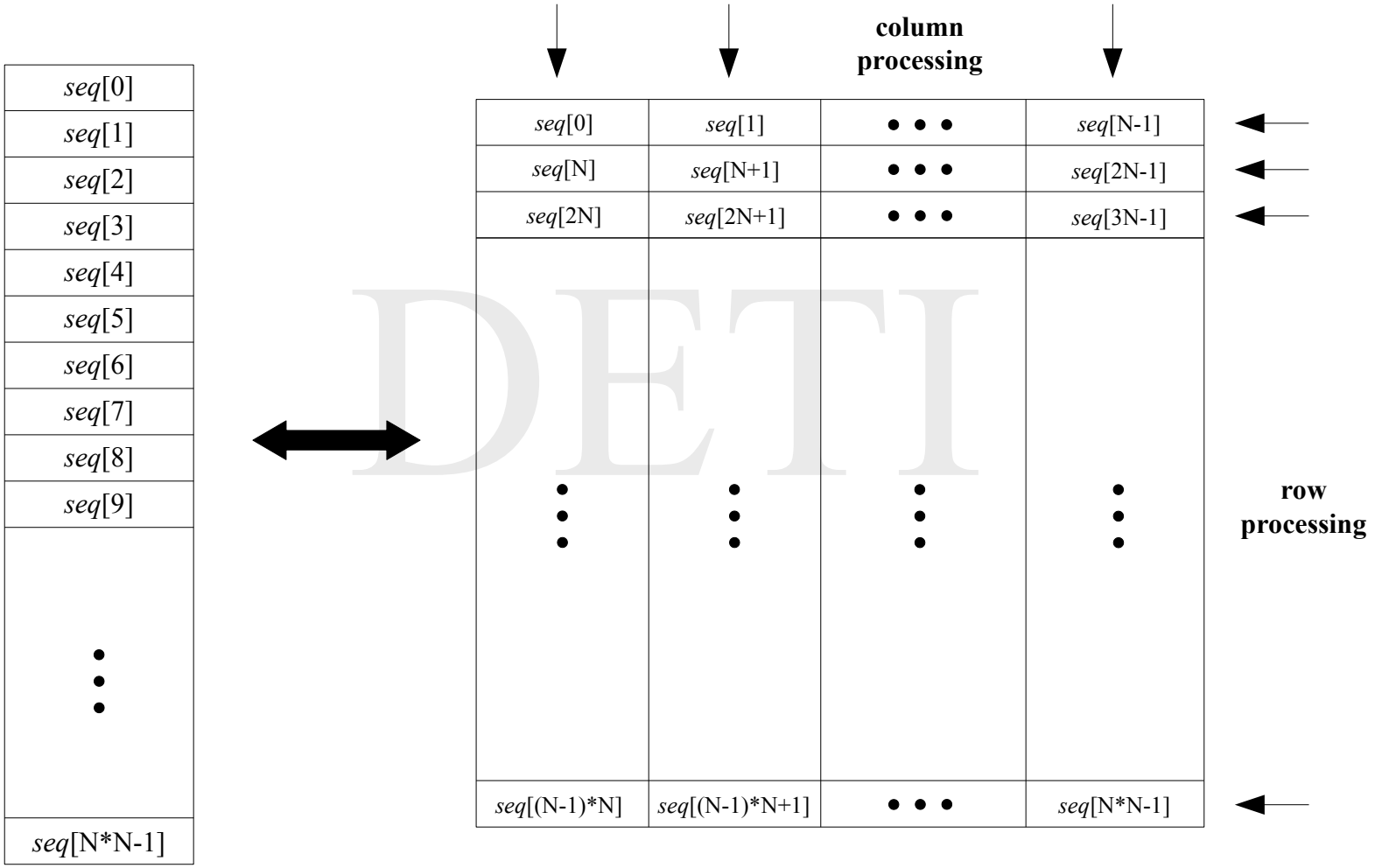
idx – thread id in a linear listing

seq – pointer to first element of the sequence

subseq – pointer to first element of the subsequence associated with idx

iter – iteration

Mapping a thread to a subsequence - 2



Row processing

$$0 \leq idx < \left(N >> iter\right)$$

$$subseq = seq + N * \left(1 << iter\right) * idx \quad \Rightarrow$$

$$\Rightarrow \quad subseq[i] = seq[N * \left(1 << iter\right) * idx + i] \ ,$$

$$\text{with} \quad 0 \leq i < \left(1 << iter\right) * N$$

Column processing

$$0 \leq idx < (N >> iter)$$

$$subseq = seq + (1 << iter) * idx \Rightarrow$$

$$\Rightarrow \quad subseq[i] = seq[(1 << iter) * idx + N * (i \bmod N) + (i \operatorname{div} N)] \ ,$$

$$\text{with} \quad 0 \leq i < (1 << iter) * N$$