

SkeTo

data parallel

LIB

cell cell

"accelerators sep"

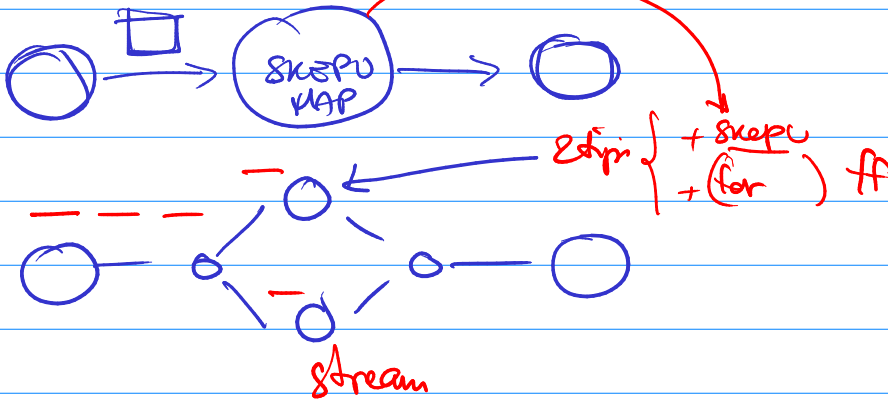
main

C1

C2

data

map function



Rewriting Rules } refactoring
 } source-to-source compilers

Introduction/elimination

form introduction $\Delta \rightarrow \text{form}(\Delta)$

form elimination $\text{form}(\Delta) \rightarrow \Delta$

pipe introduction $\text{comp}(\Delta_1, \Delta_2) \rightarrow \text{pipe}(\Delta_1, \Delta_2)$

pipe elimination $\text{pipe}(\Delta_1, \Delta_2) \rightarrow \text{comp}(\Delta_1, \Delta_2)$

map/pipe promotion $\text{map}(\text{pipe}(\Delta_1, \Delta_2)) \rightarrow \text{pipe}(\text{map}(\Delta_1), \text{map}(\Delta_2))$

map/comp promotion $\text{map}(\text{comp}(\Delta_1, \Delta_2)) \rightarrow \text{comp}(\text{map}(\Delta_1), \text{map}(\Delta_2))$

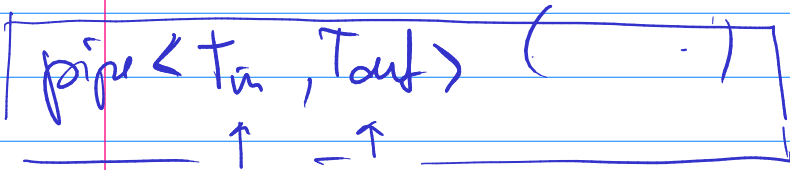
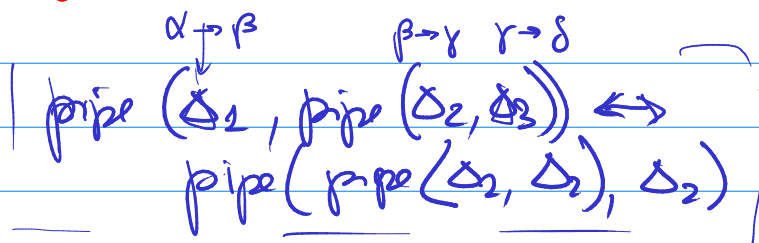
$\text{map}(\text{pipe}(\Delta_1, \Delta_2)) \rightarrow \text{pipe}(\text{map}(\Delta_1), \text{map}(\Delta_2))$

$\text{map}(\text{comp}(\Delta_1, \Delta_2)) \rightarrow \text{comp}(\text{map}(\Delta_1), \text{map}(\Delta_2))$

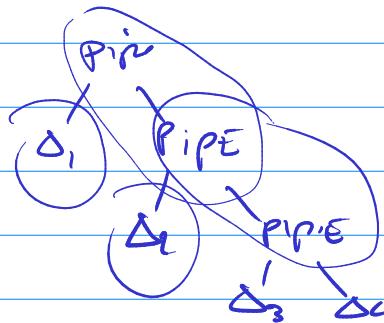
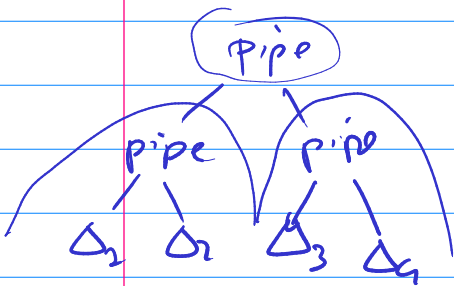
$\text{map}(f \circ g) = \text{map}(f) \circ \text{map}(g)$

associativity

pipe
comp



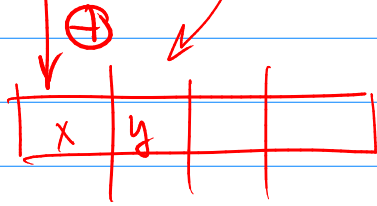
$\text{pipe} : (\alpha \rightarrow \beta) \rightarrow (\beta \rightarrow \gamma) \rightarrow (\alpha \rightarrow \gamma)$



$$(1 \oplus, f) (x \# y) = \left((1 \oplus, f) x \right) \oplus \left((1 \oplus, f) y \right)$$

$$(1 \oplus, f) [2] = (f(2))$$

$$(1 \oplus, f) [] = i_{\oplus}$$

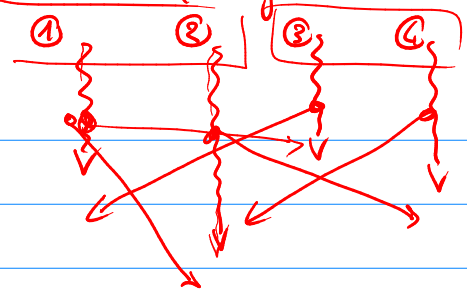


$$\text{map}(f) = (1 \#, f)$$

$$\text{reduce}(\oplus) = (1 \oplus, \text{id})$$

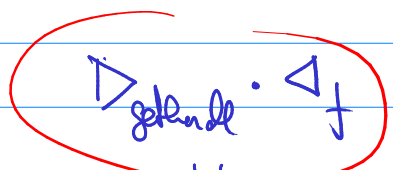
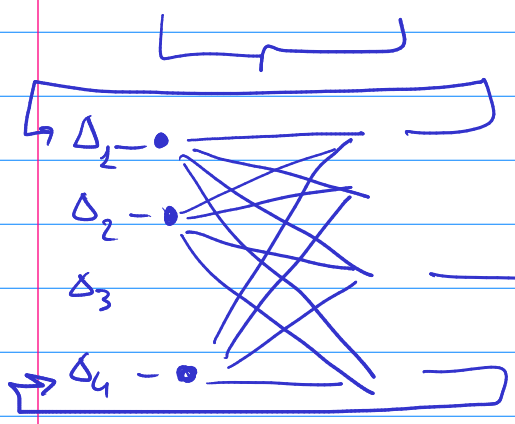
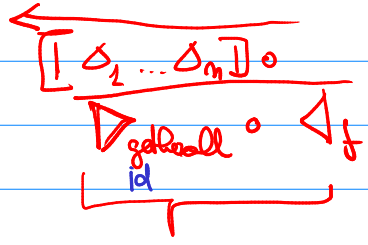
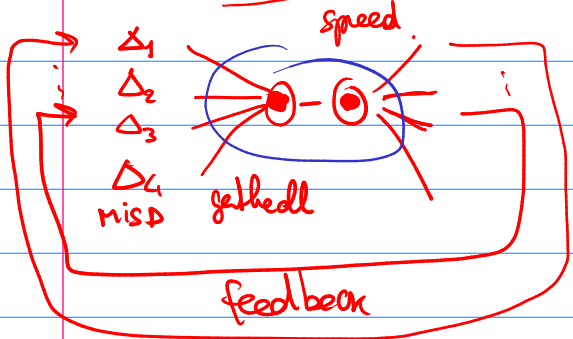
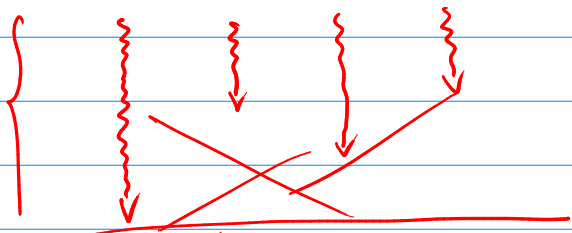
BSP
Leslie Variant
Superstep

Bulk Synchronous Programming



Computation
Communication
barriera

superstep



- $\Delta_1 \quad \{k_1, v_1\}^*$
- $\Delta_2 \quad \{k_1, v_2\}$
- Δ_3
- Δ_4

