

Programming Weak Synchronization Models

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TÉCNICO
LISBOA



LIGHTZONE
SYNCFREE

Convergent Programs

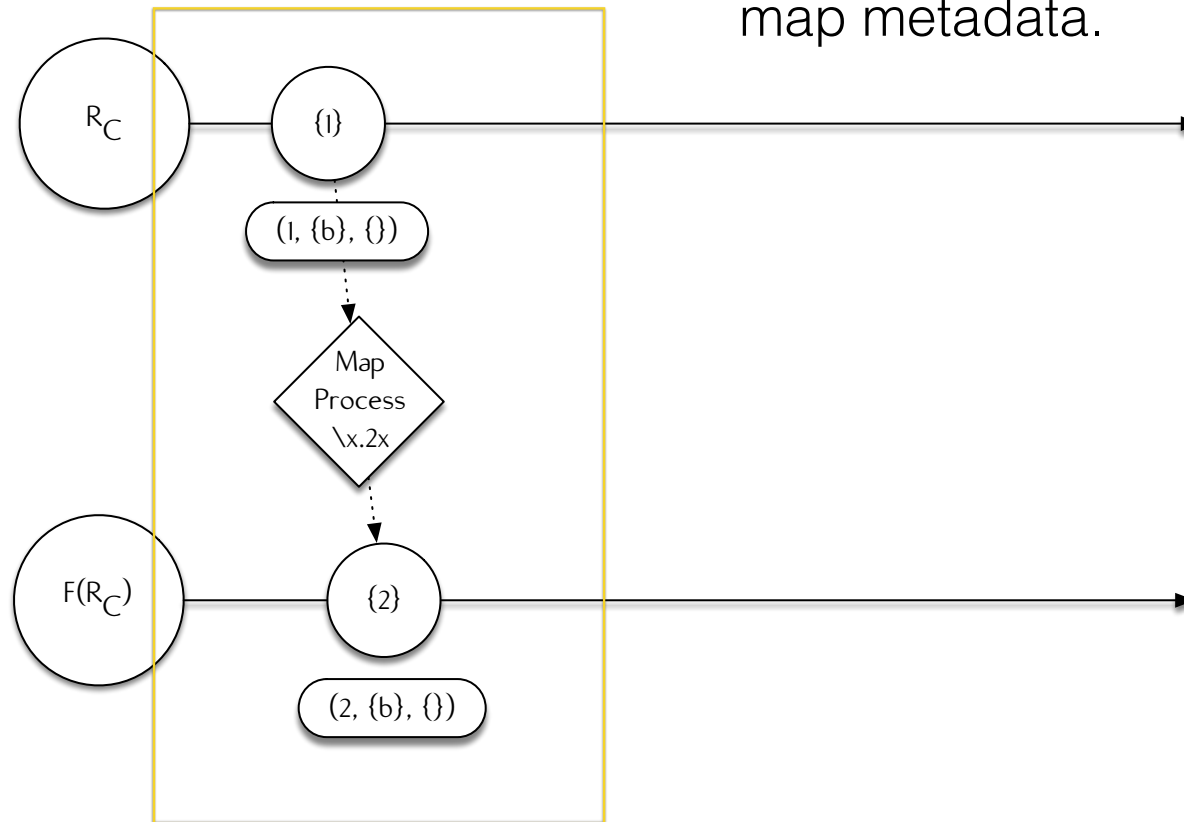
Lattice Processing

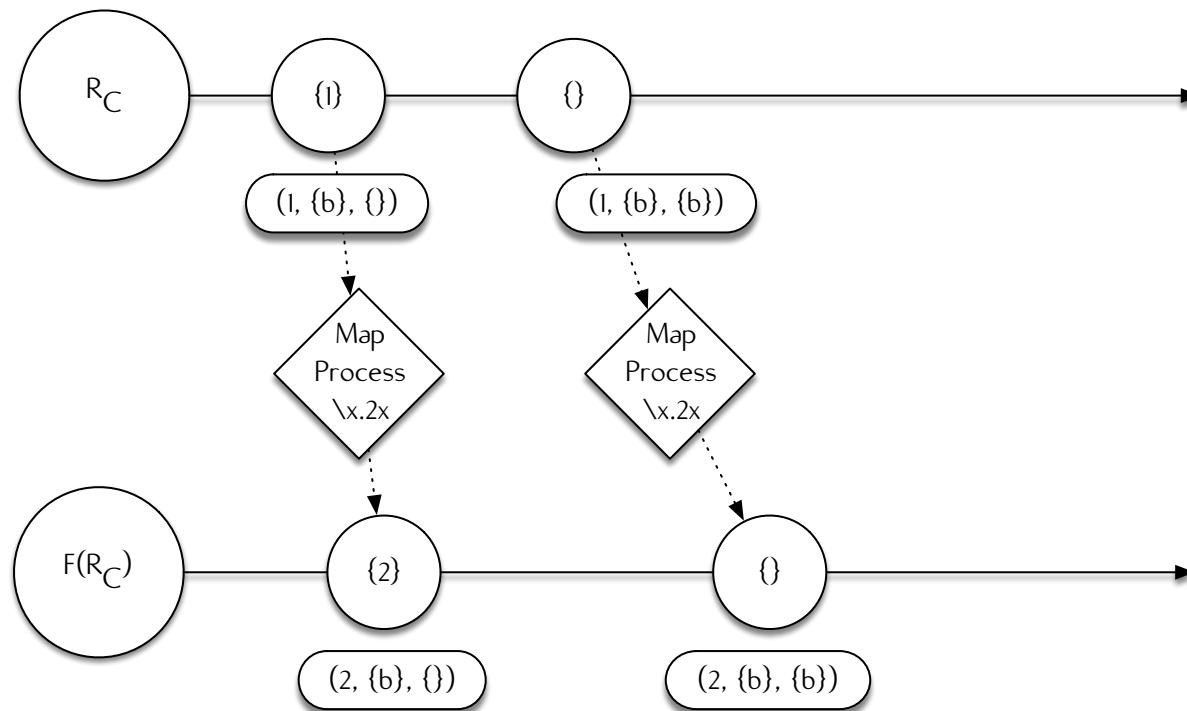
Lattice Processing

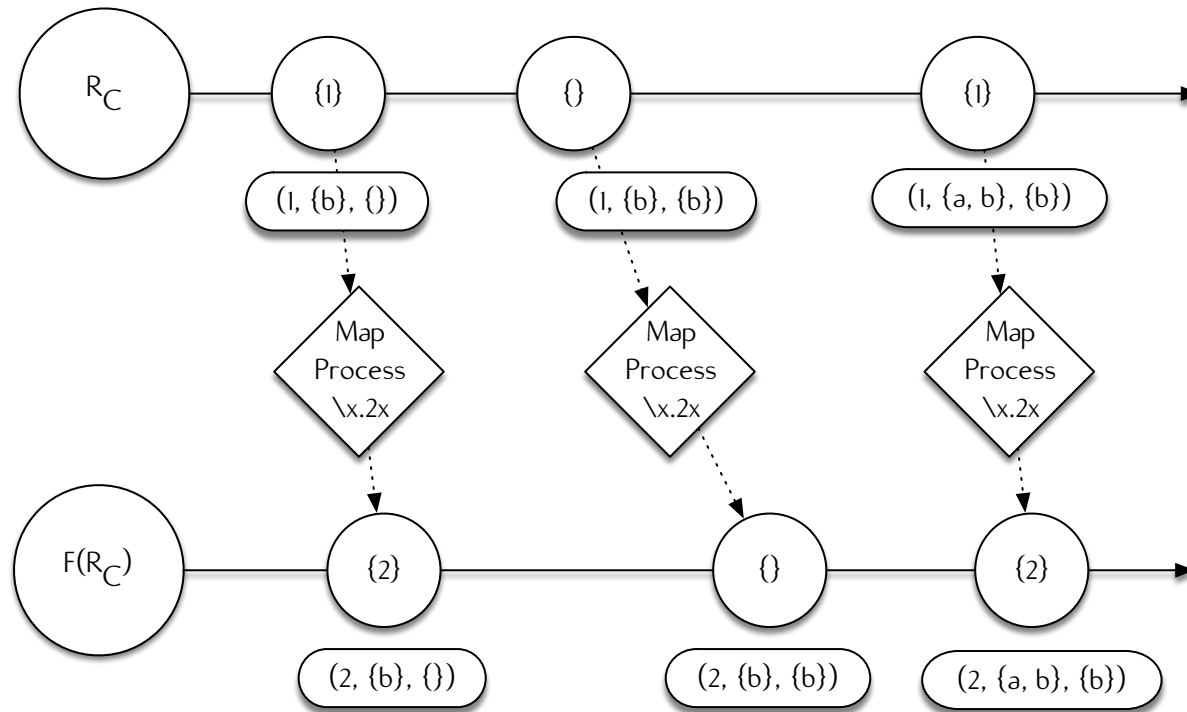
Map Example

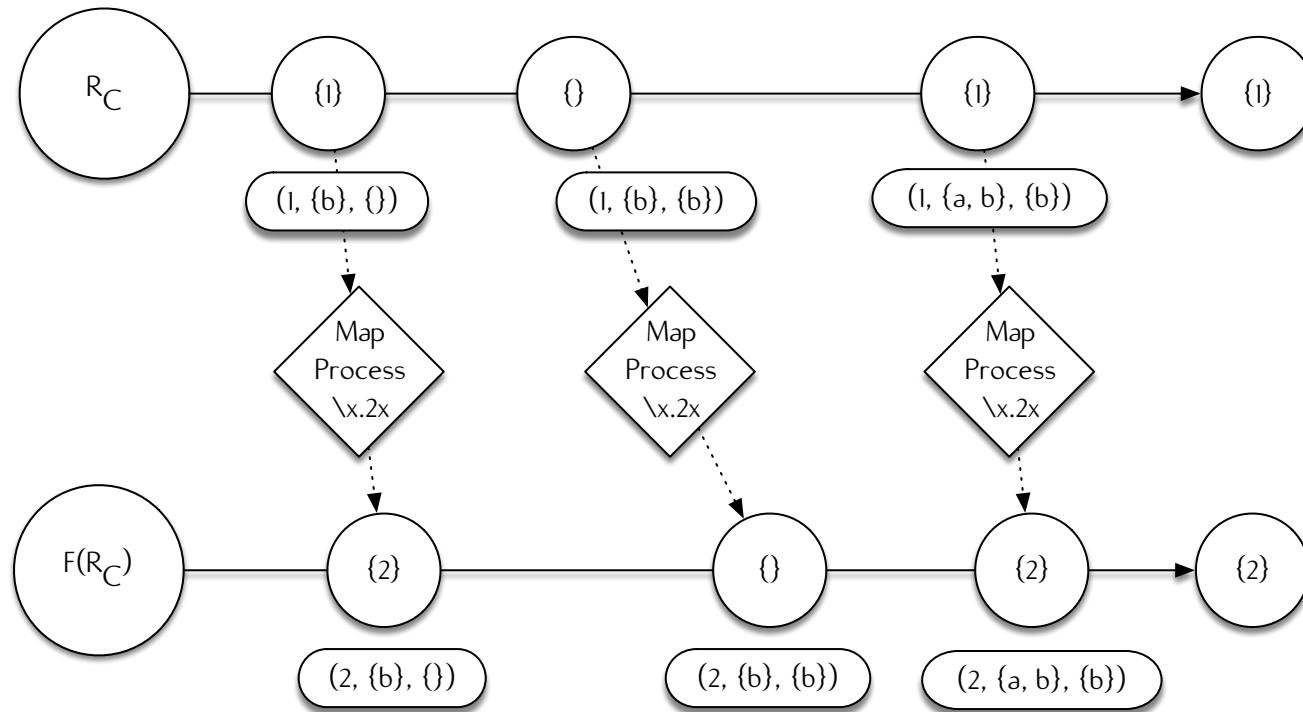


Transform element,
map metadata.





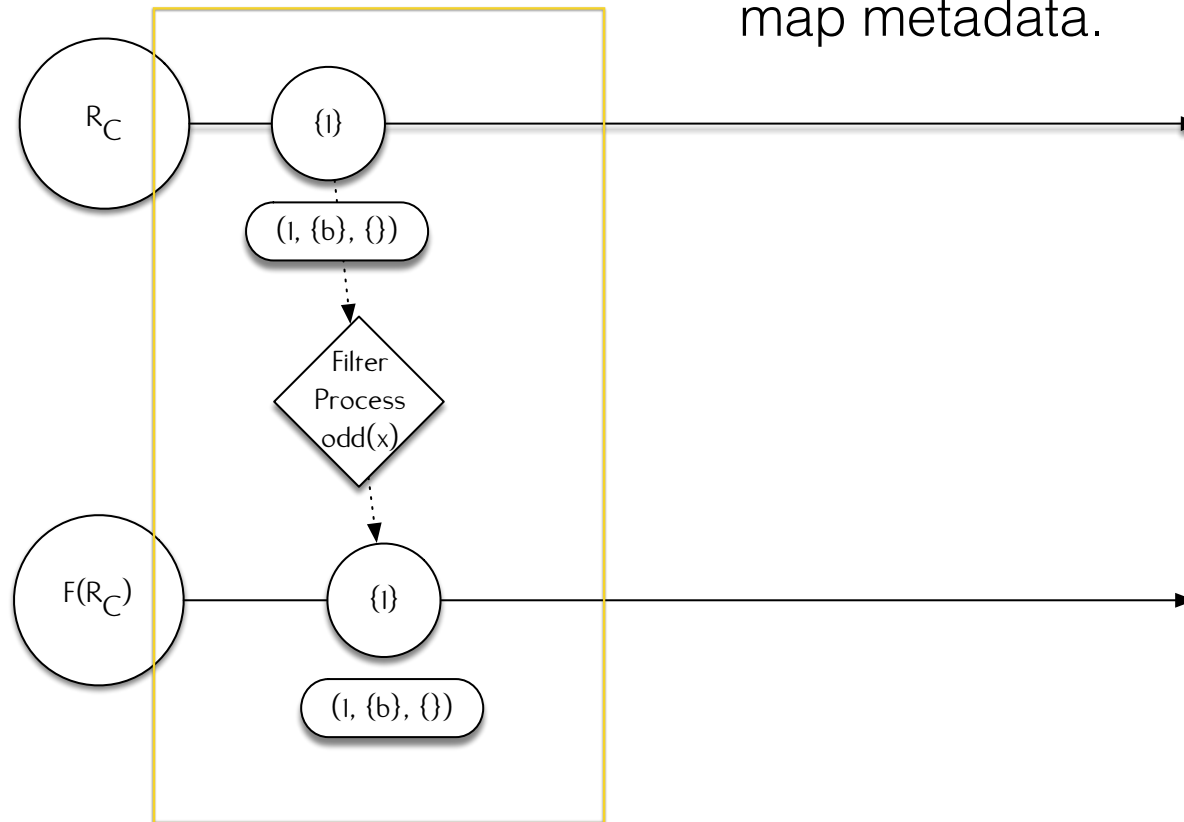


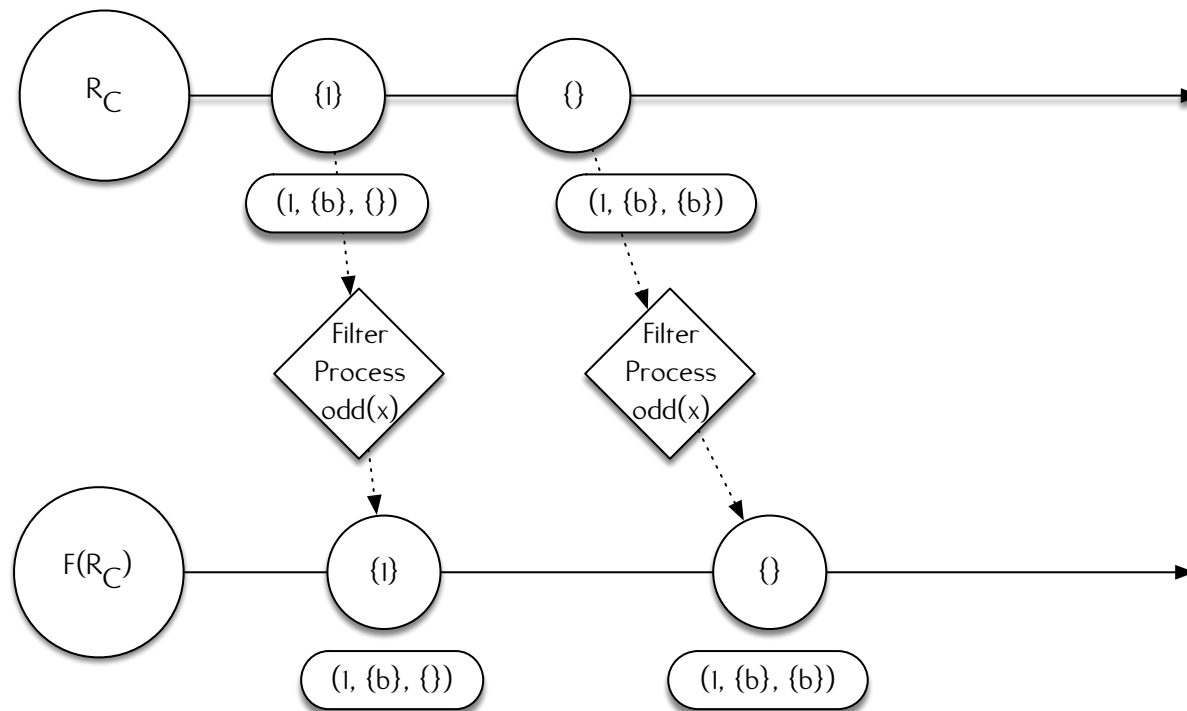


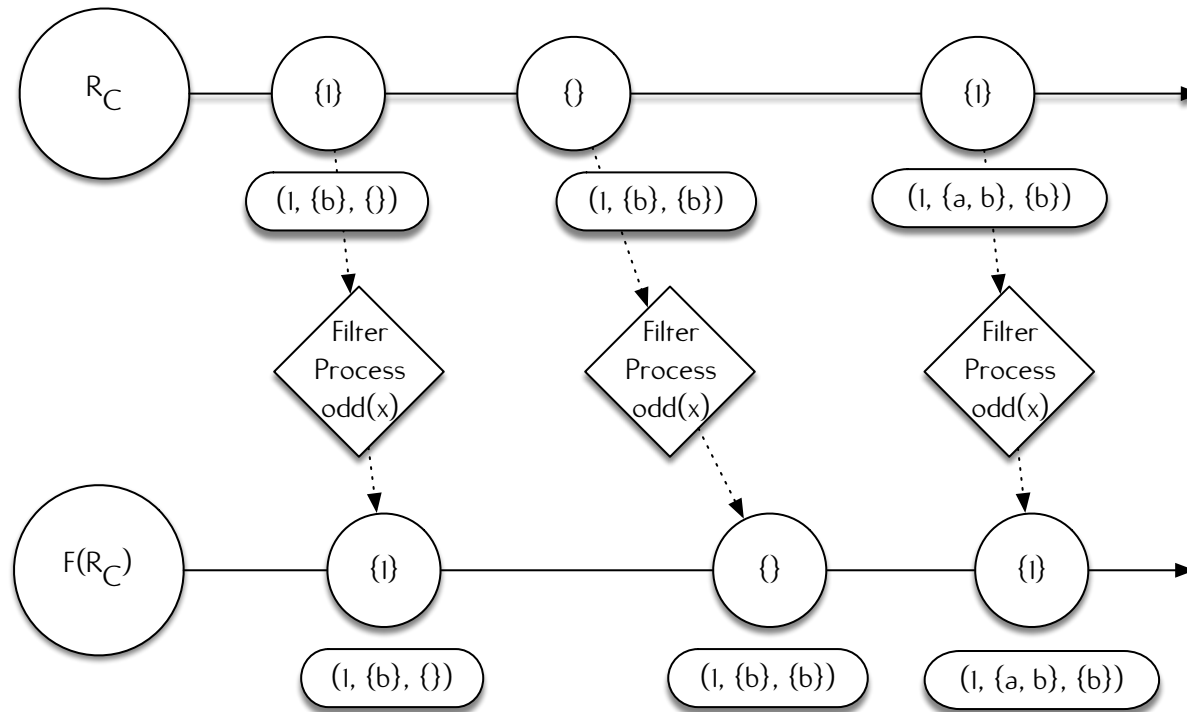
Lattice Processing Filter Example

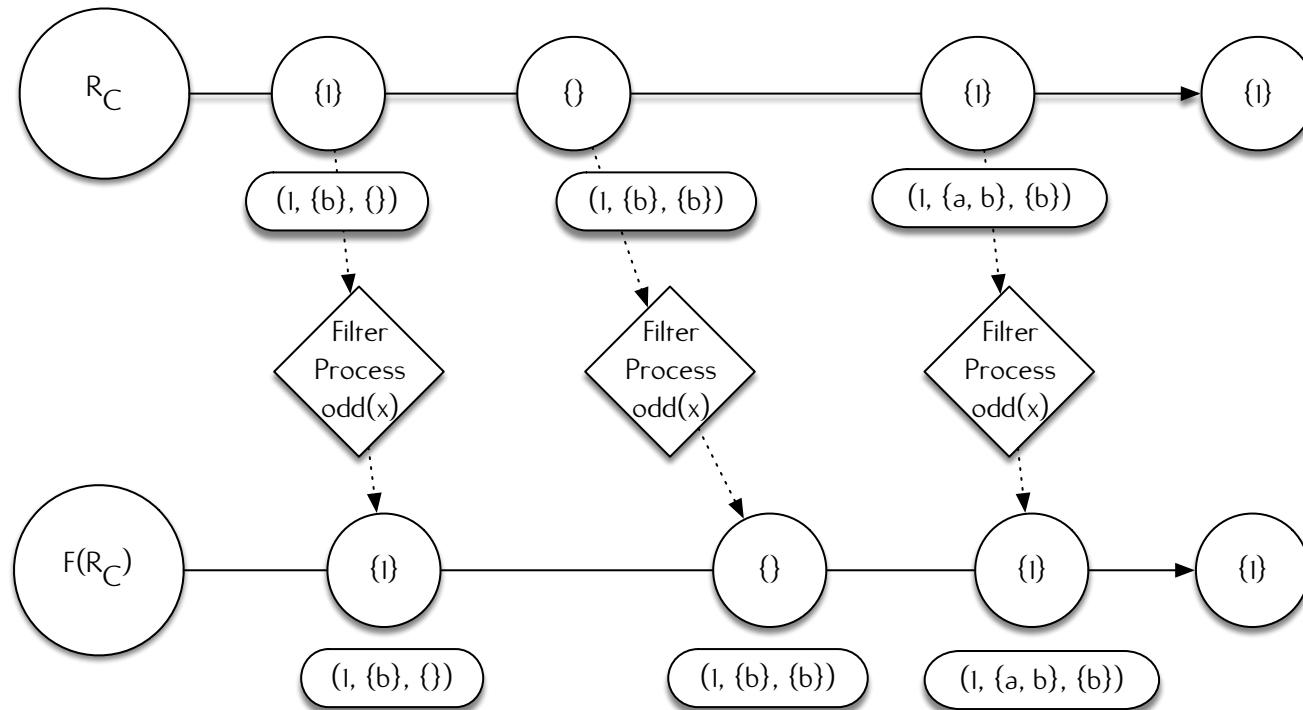


Possible omit element,
map metadata.









Lattice Processing

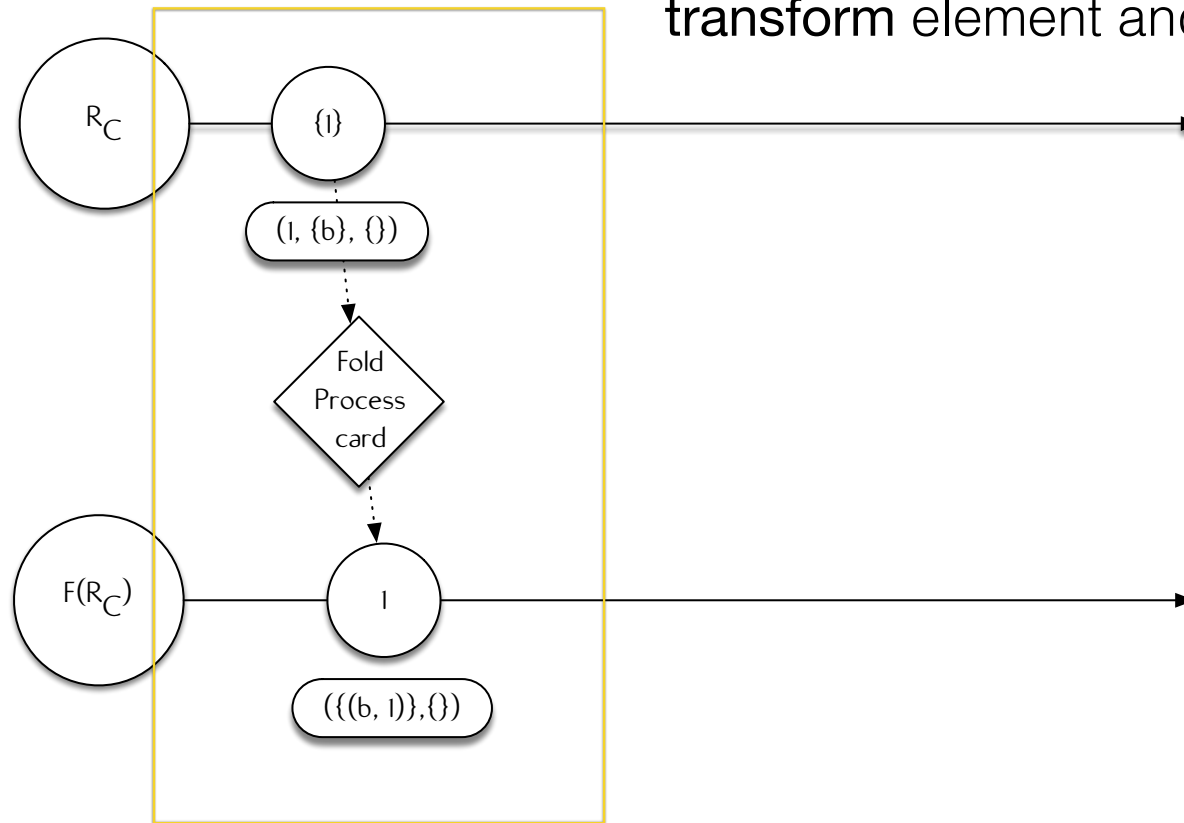
Fold Example

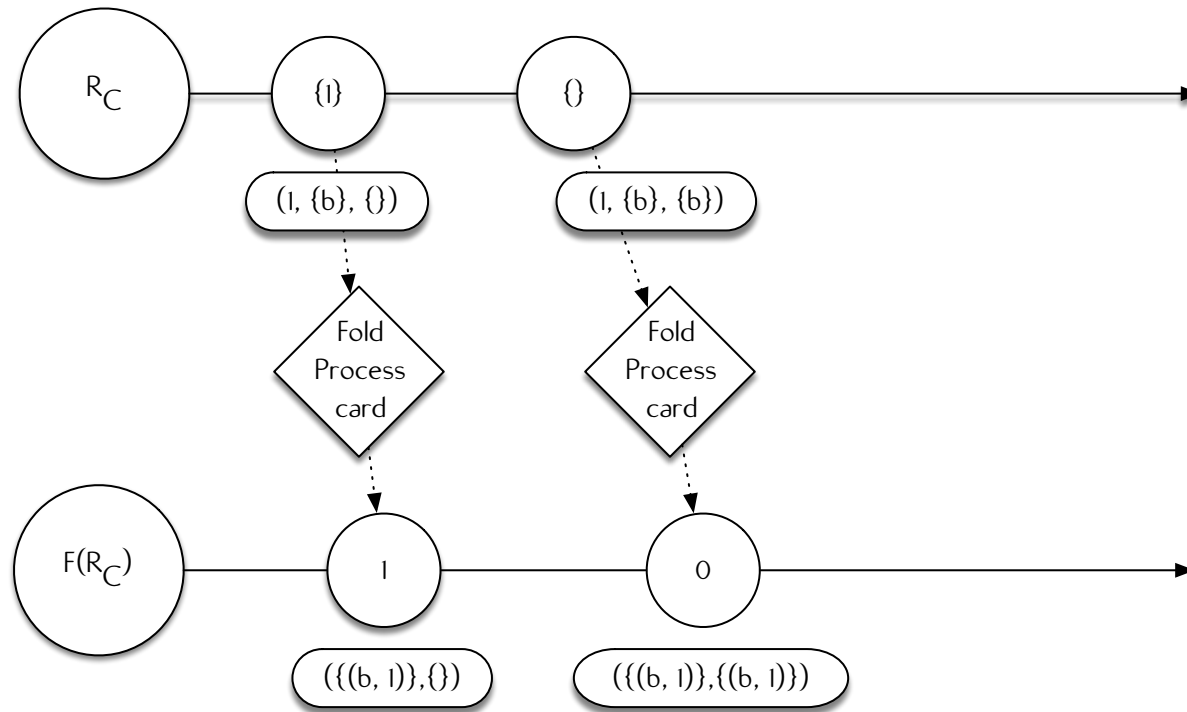
Fold Operation

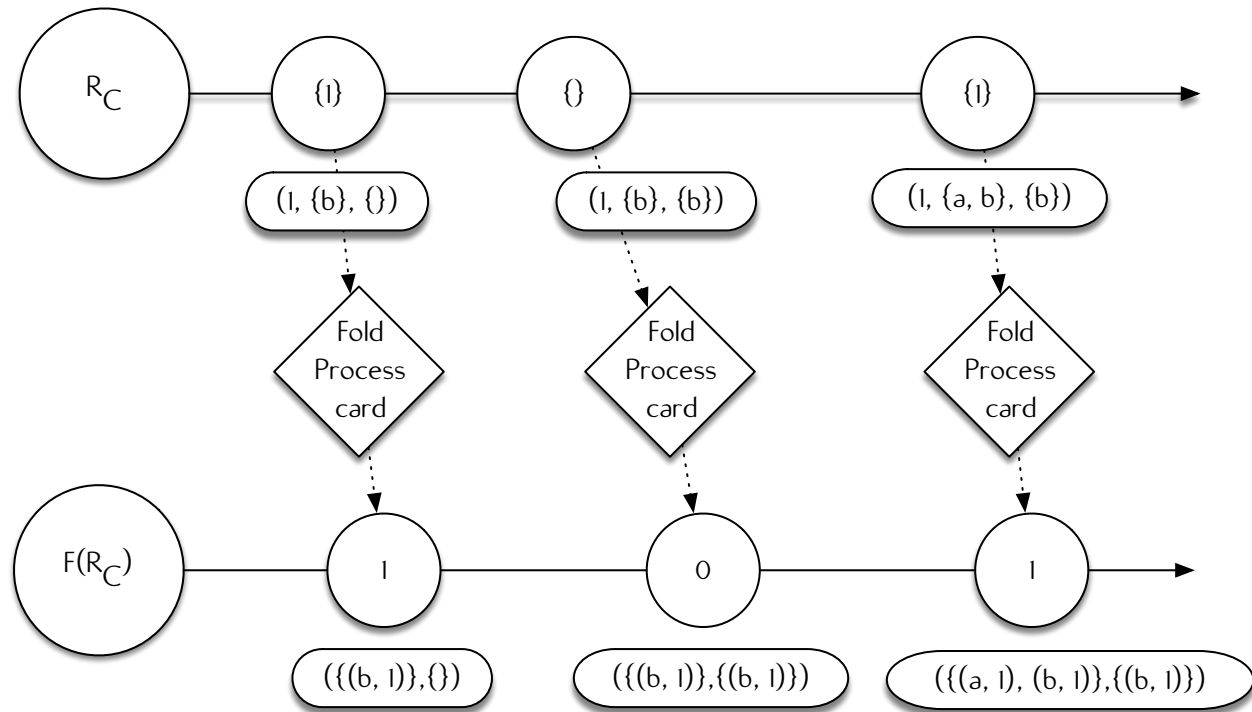
- **Morphism between CRDTs**
For example, from a CRDT set to a CRDT counter
- **Restricted in expressiveness**
“Unordered” sets imply combiner must be associative, commutative, idempotent
- **Invertable**
Operations must have an inverse for operating on “tombstone” values

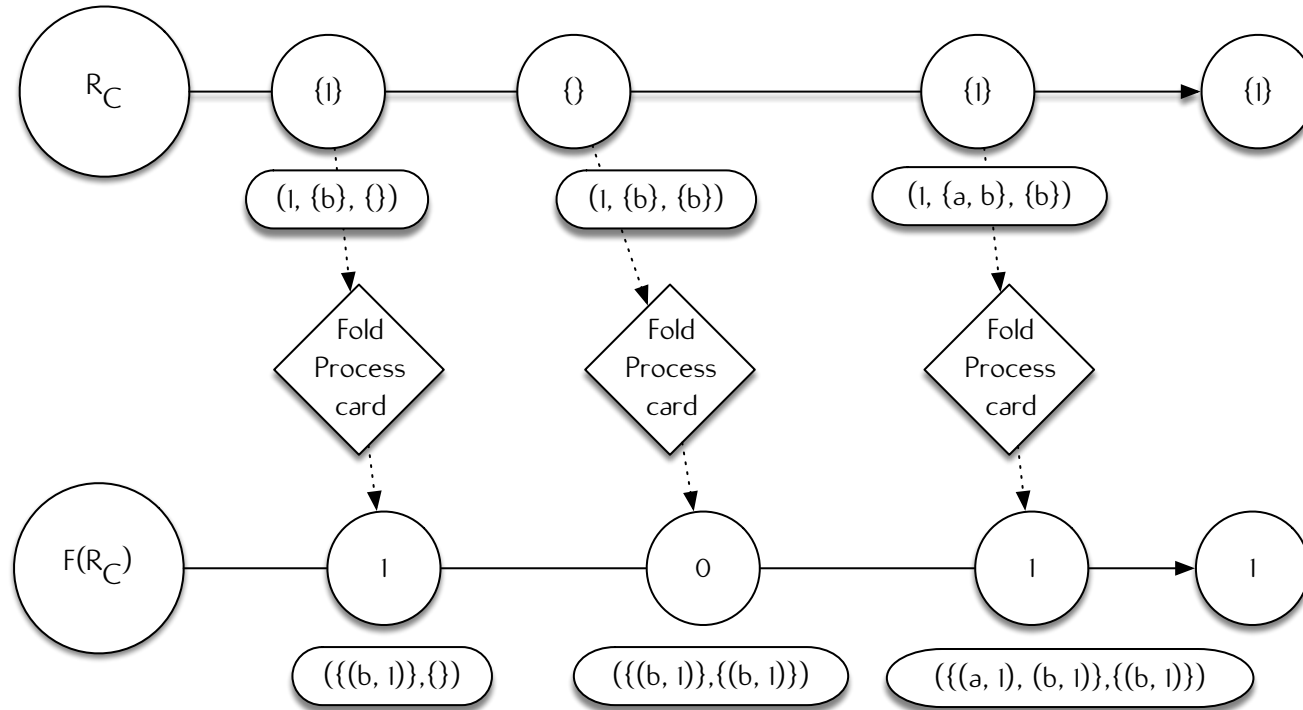


Apply morphism and
transform element and metadata.



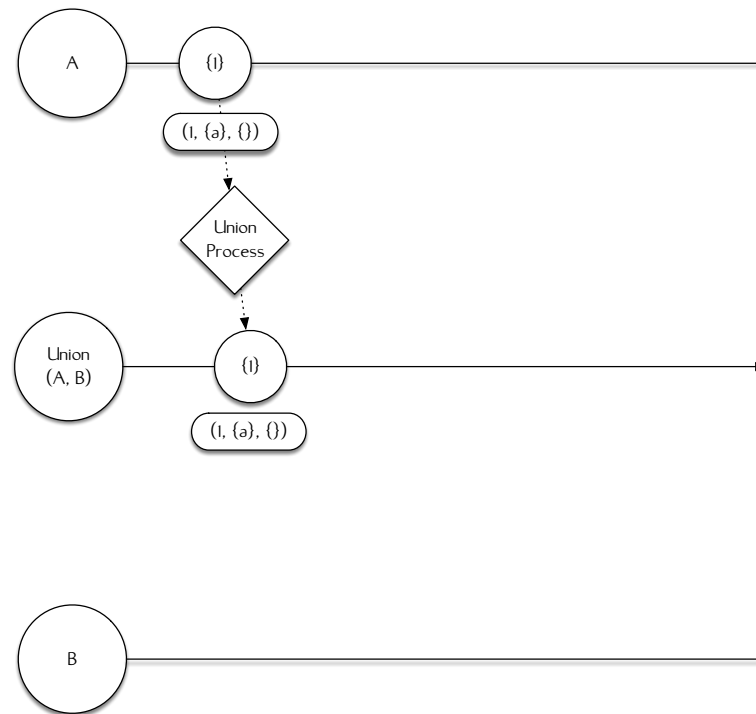


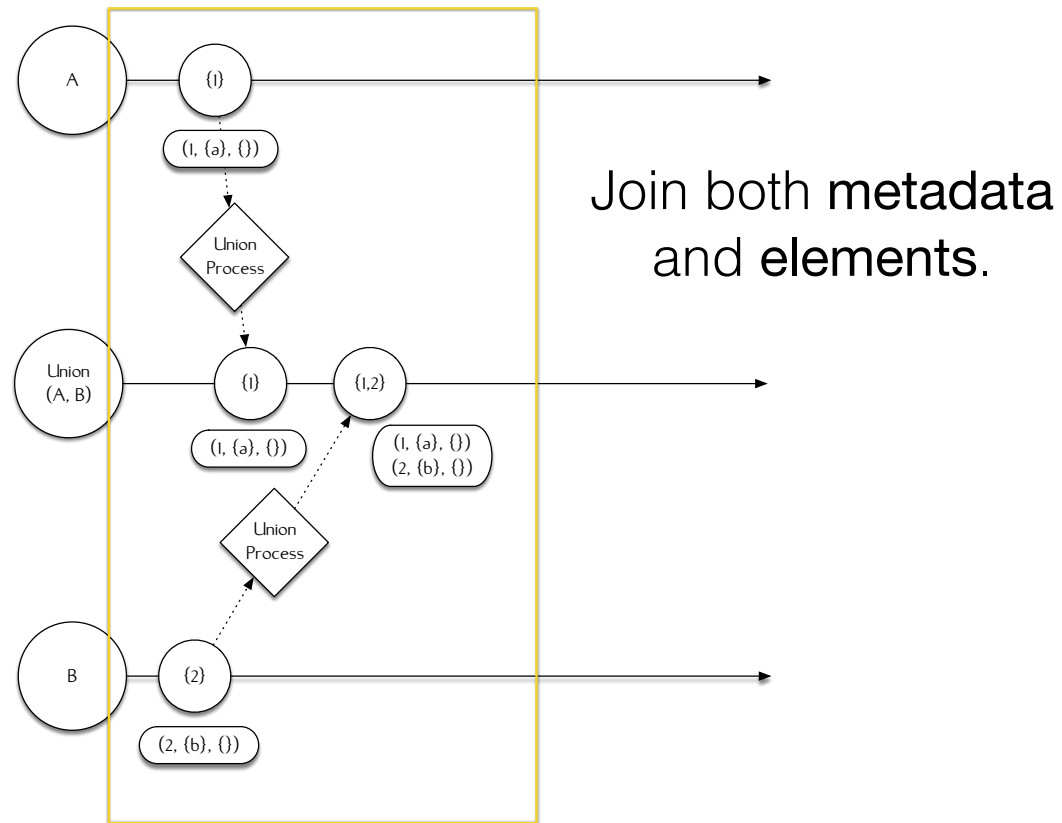


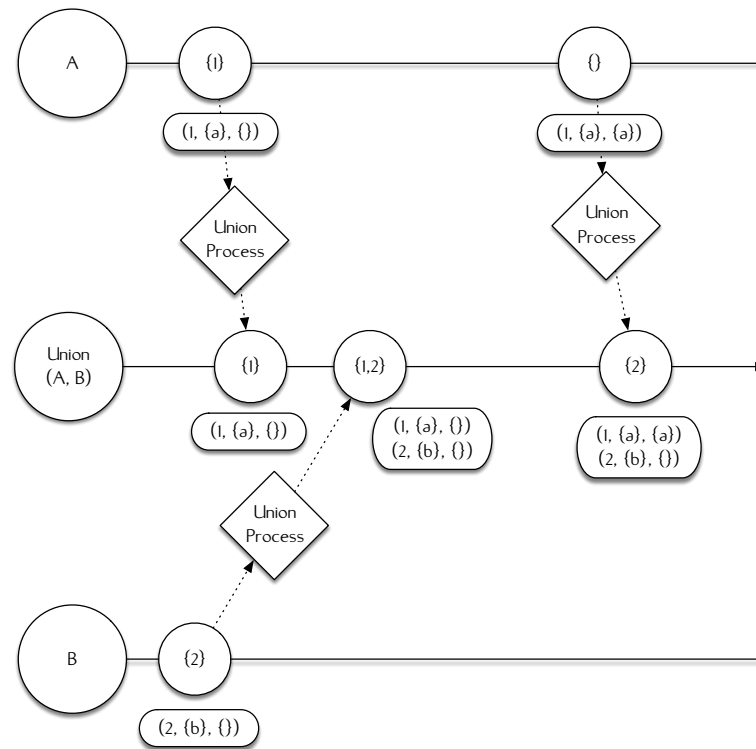


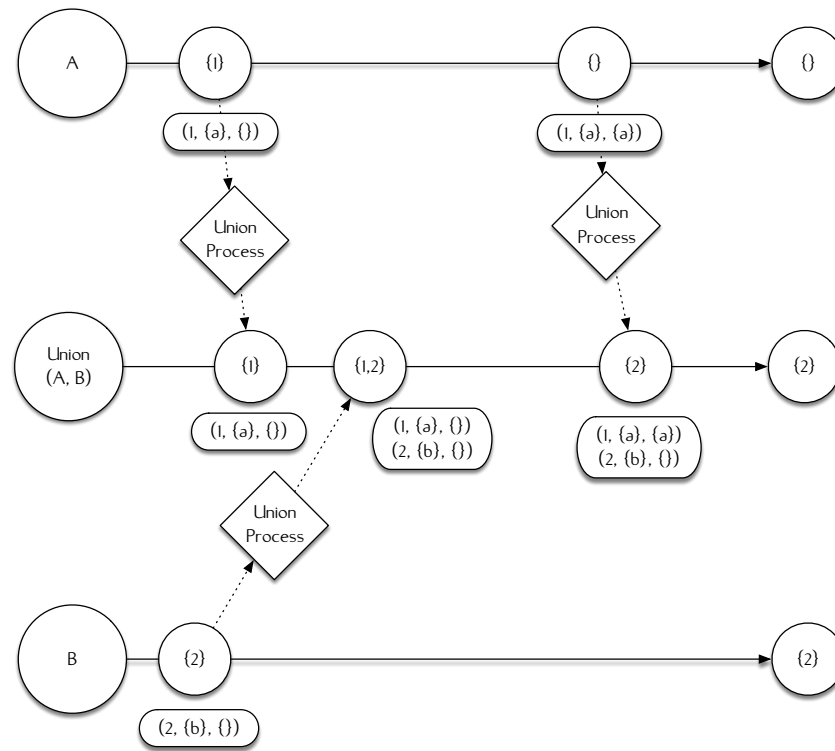
Lattice Processing Union Example







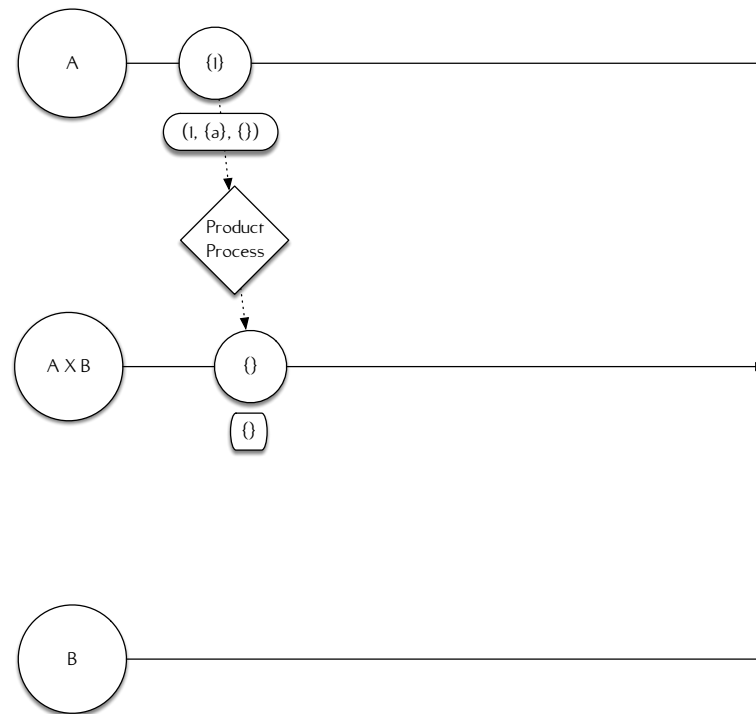


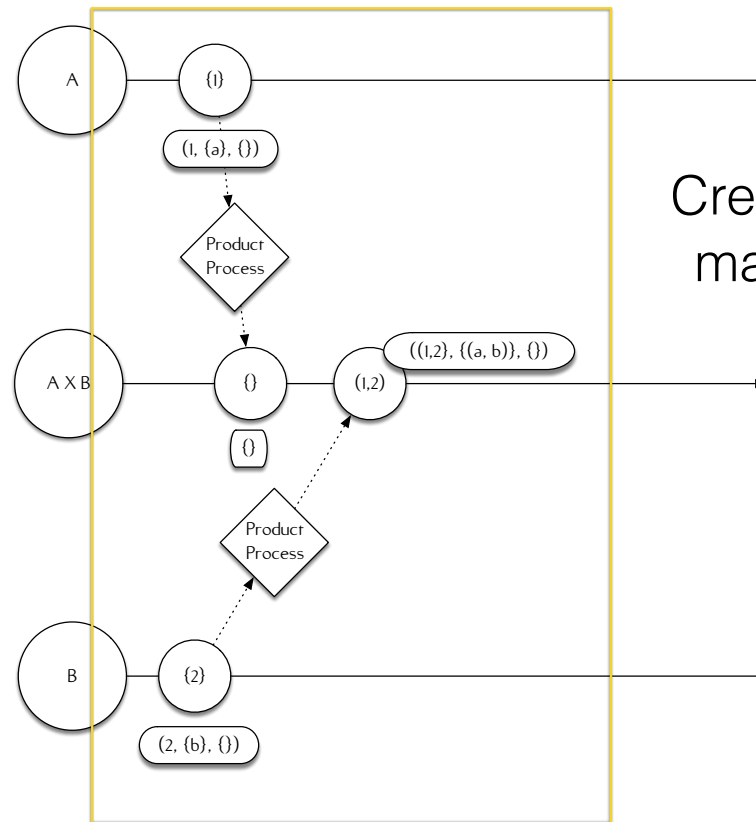


Lattice Processing

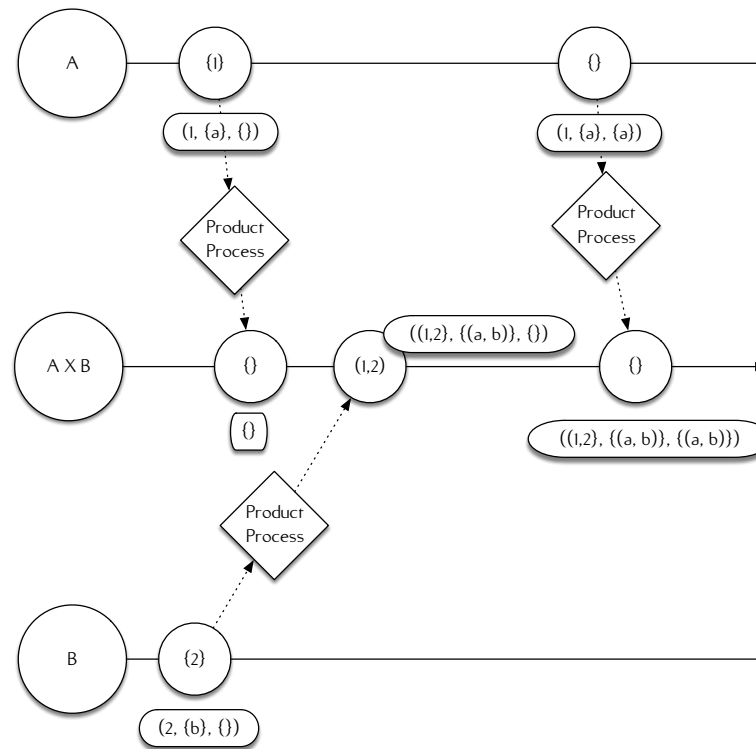
Product Example

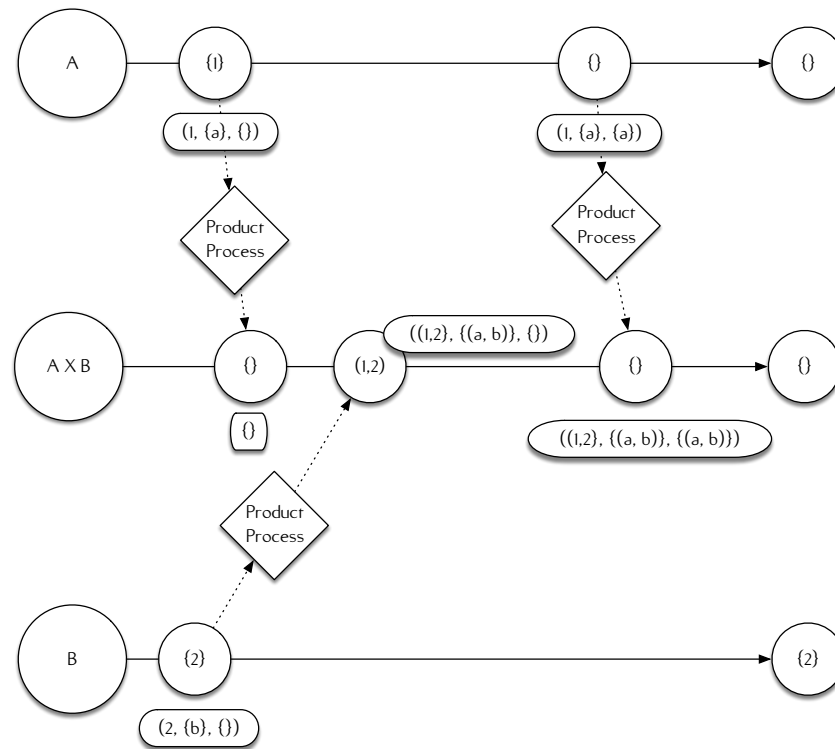






Create new **elements** and
map **metadata** through.





Lattice Processing

Intersection Example

