Introduction: Multiview Programming

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Portland State University
Portland, Oregon, USA

Portland State UNIVERSITY

Abstraction Rules, OK?

- As programmers, we know the value of abstraction

Abstraction Rules, OK?

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Representing a date in a computer

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Tuesday, 26th May 2004

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05.26.04

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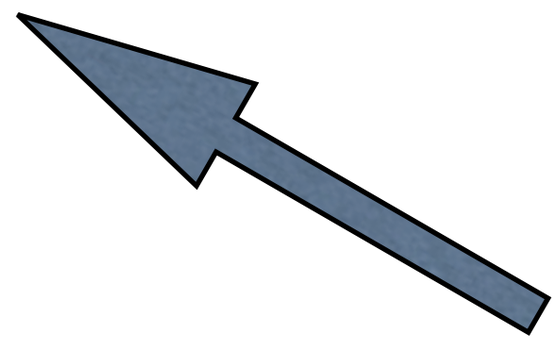

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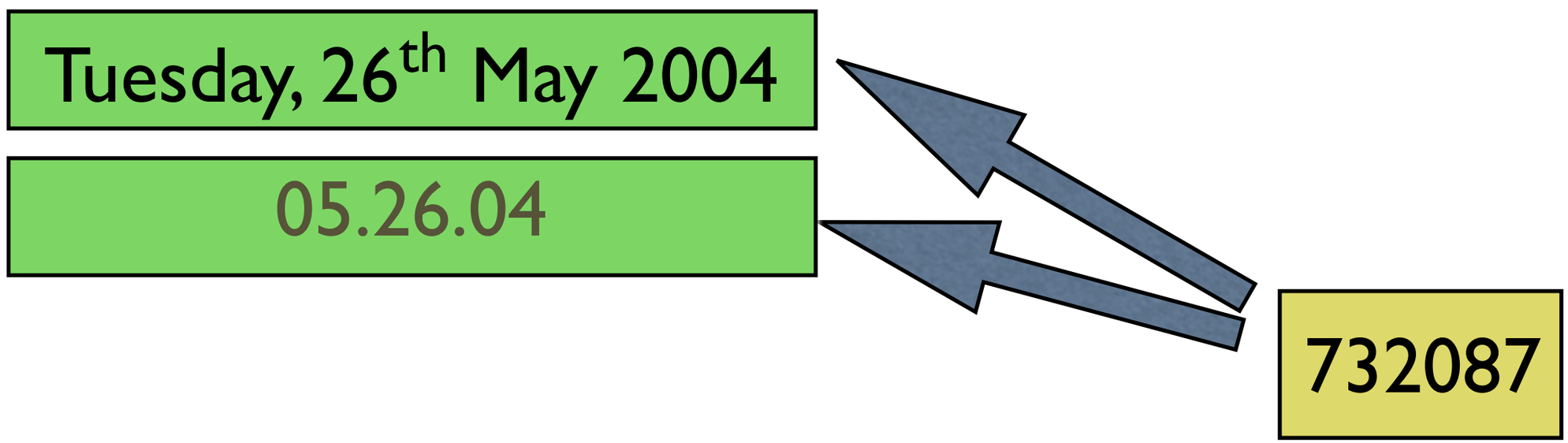

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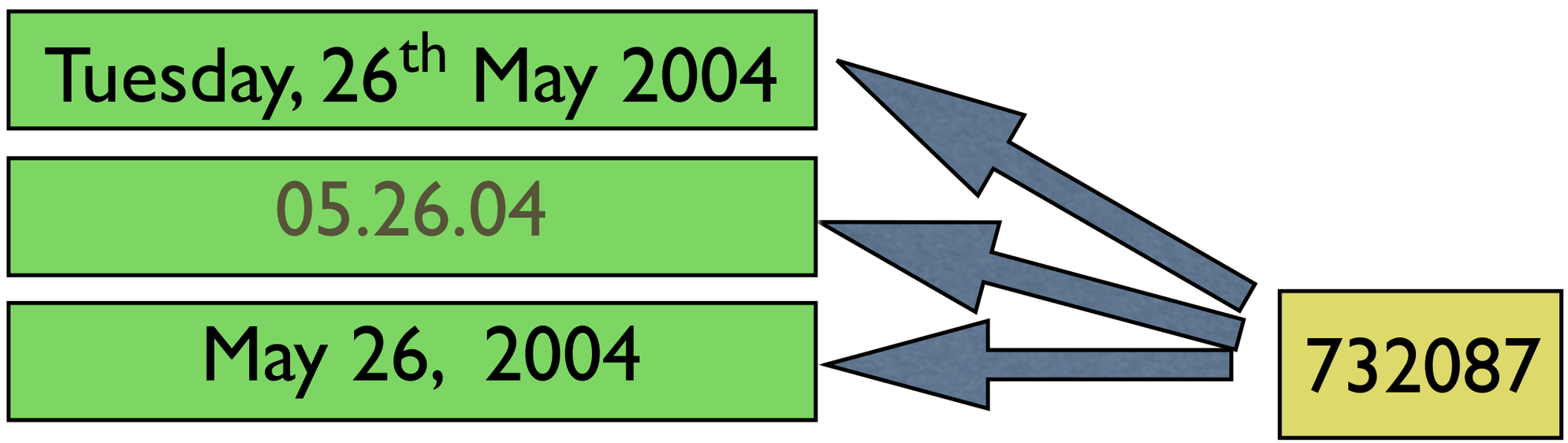

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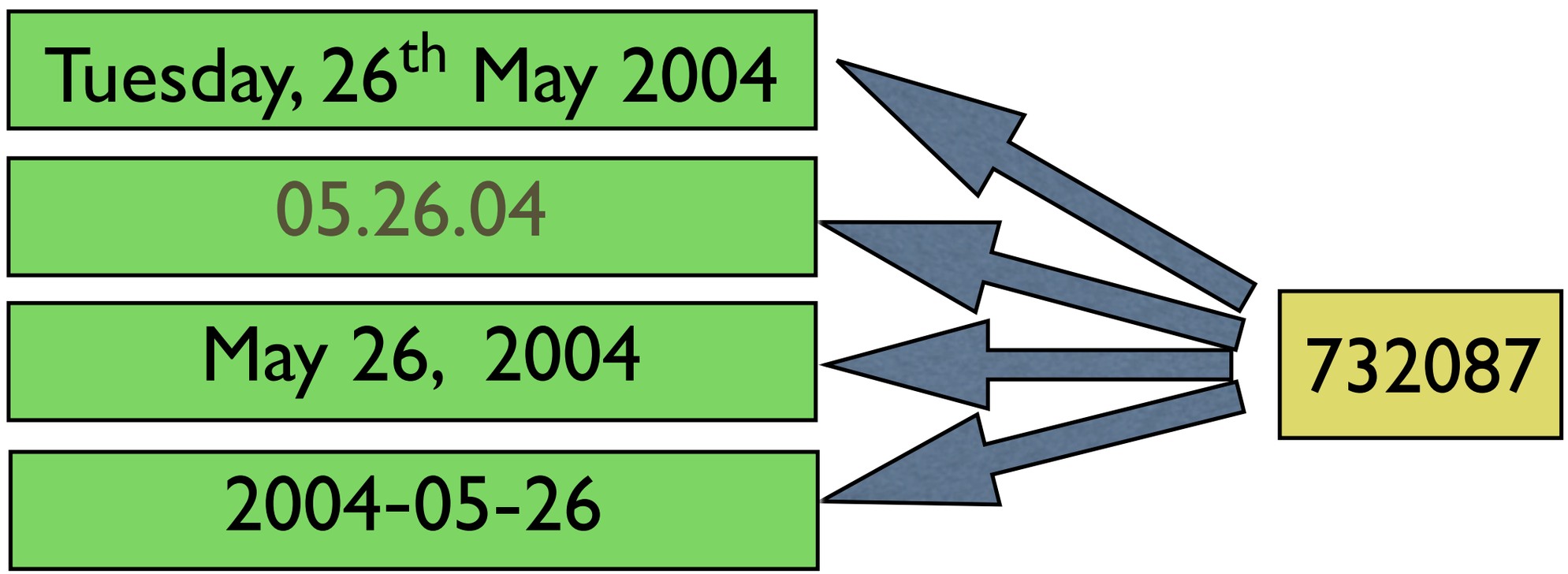

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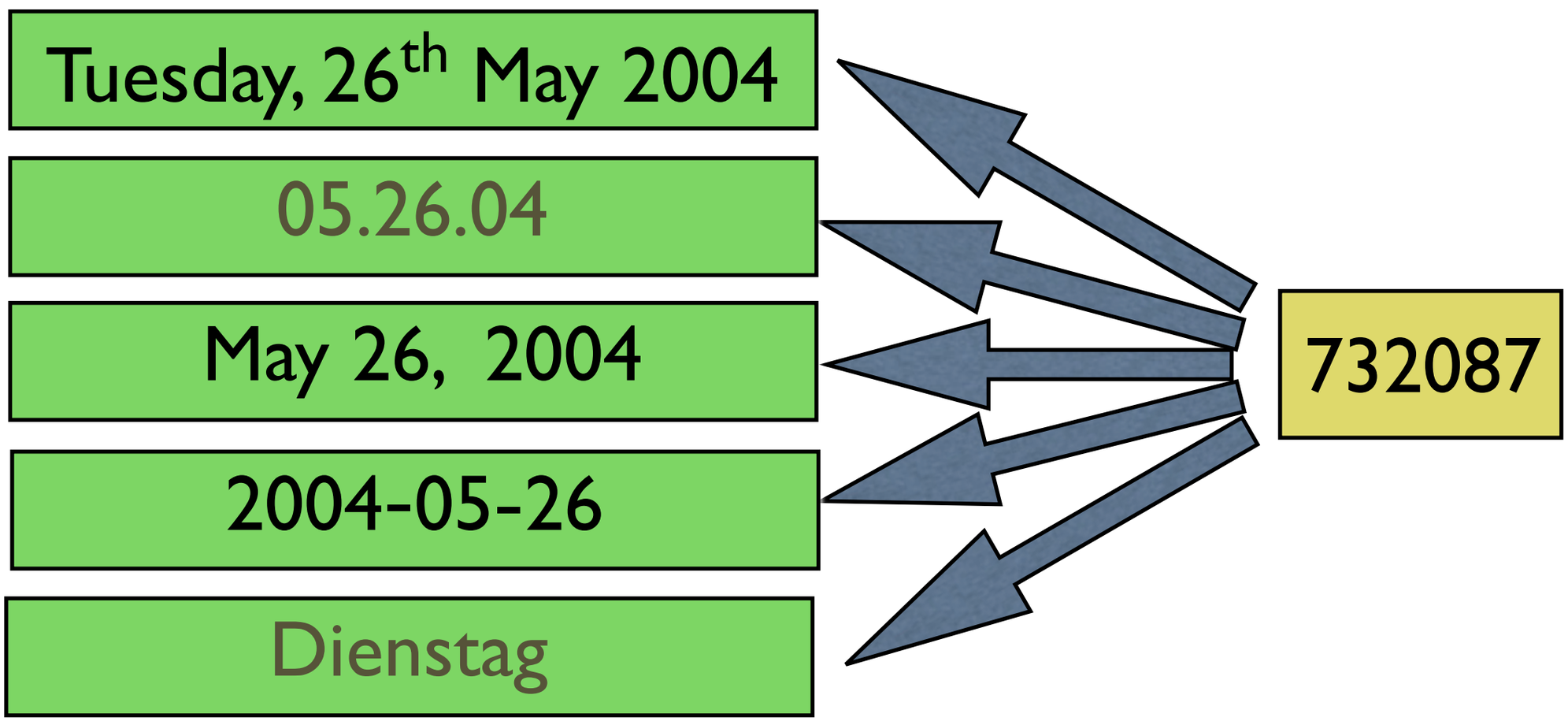

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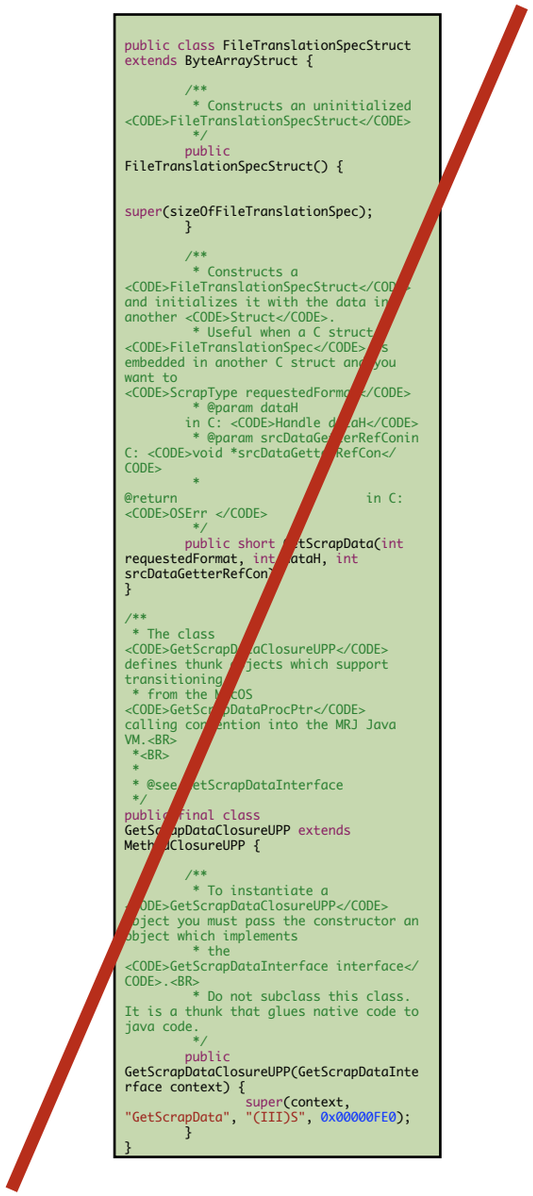

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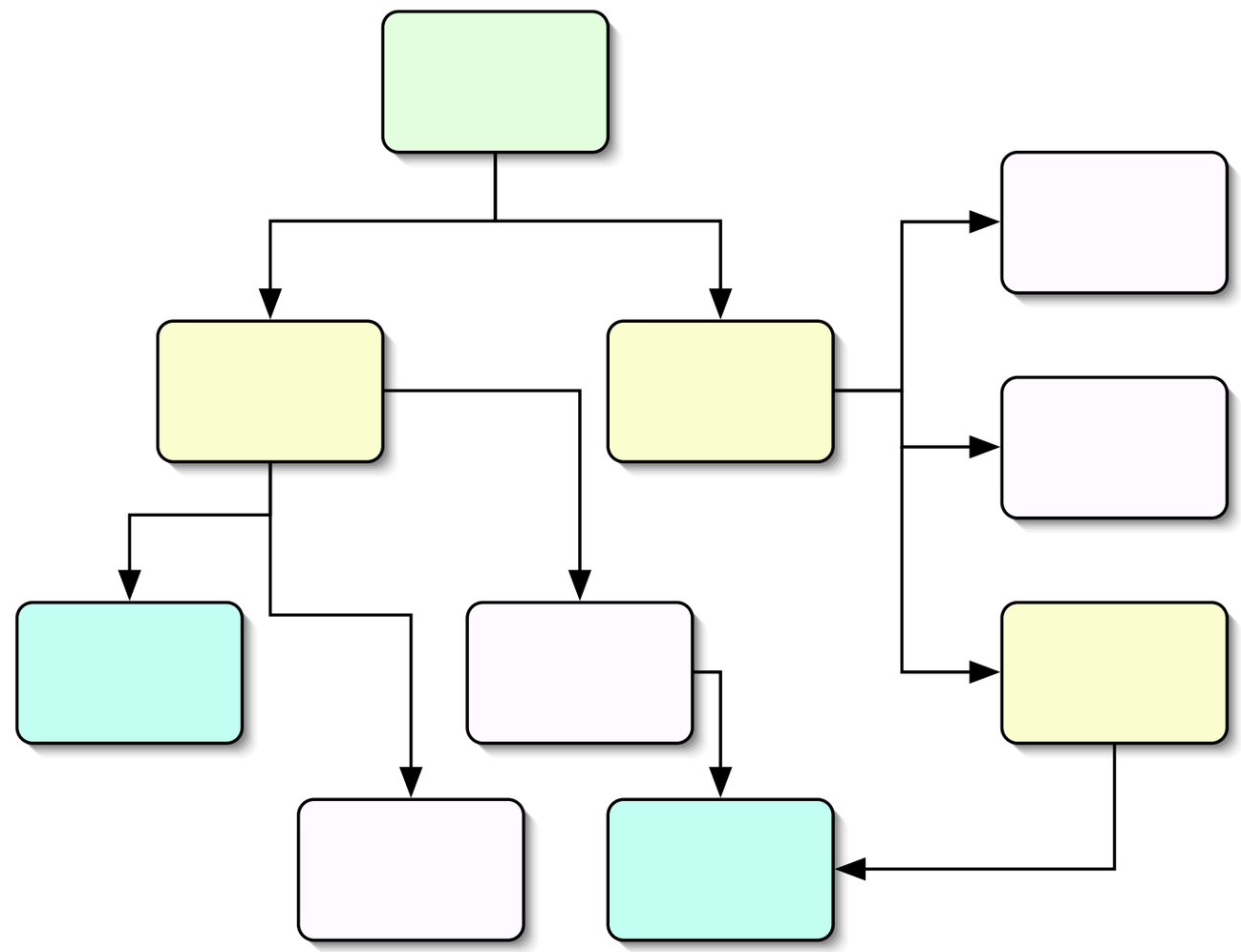

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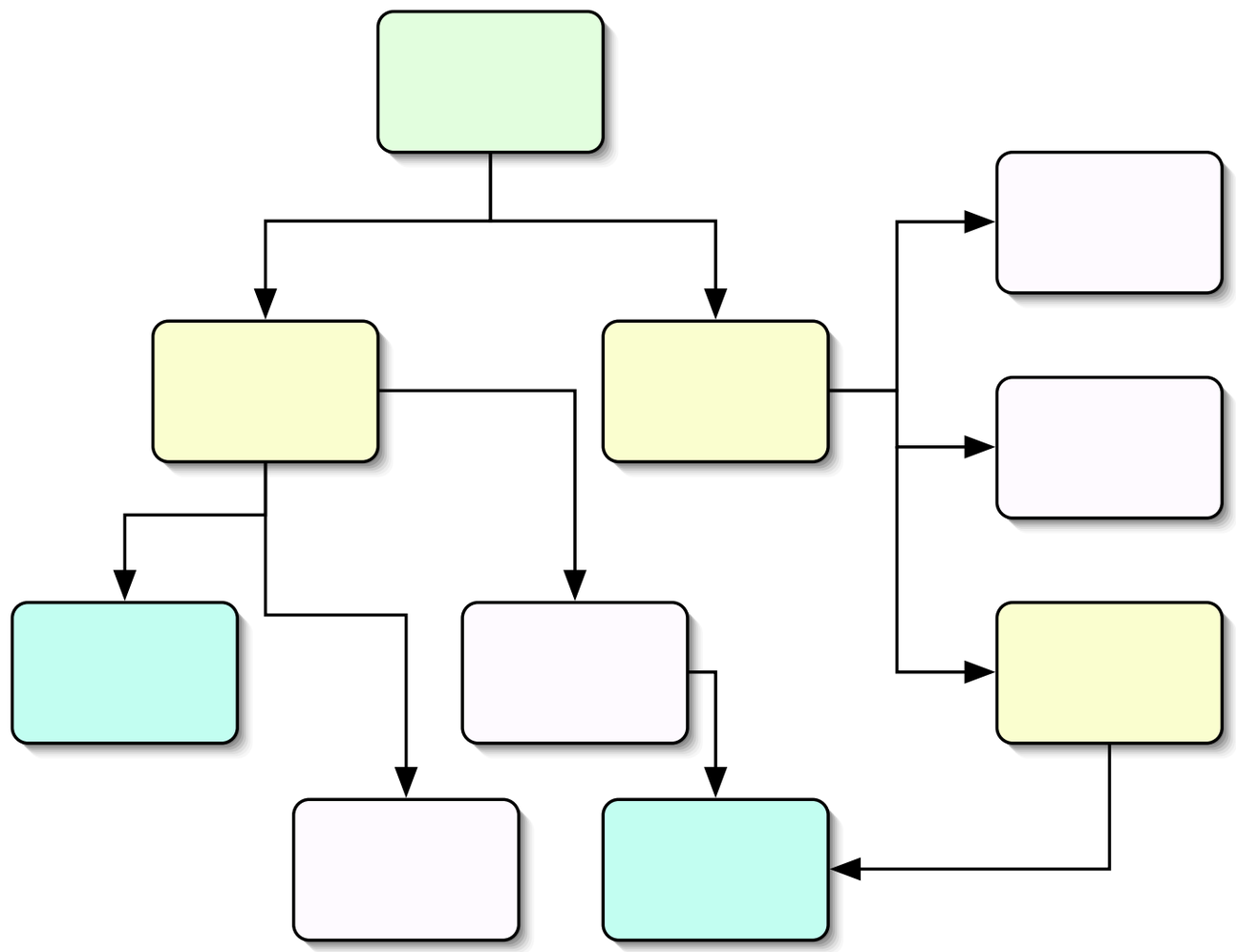

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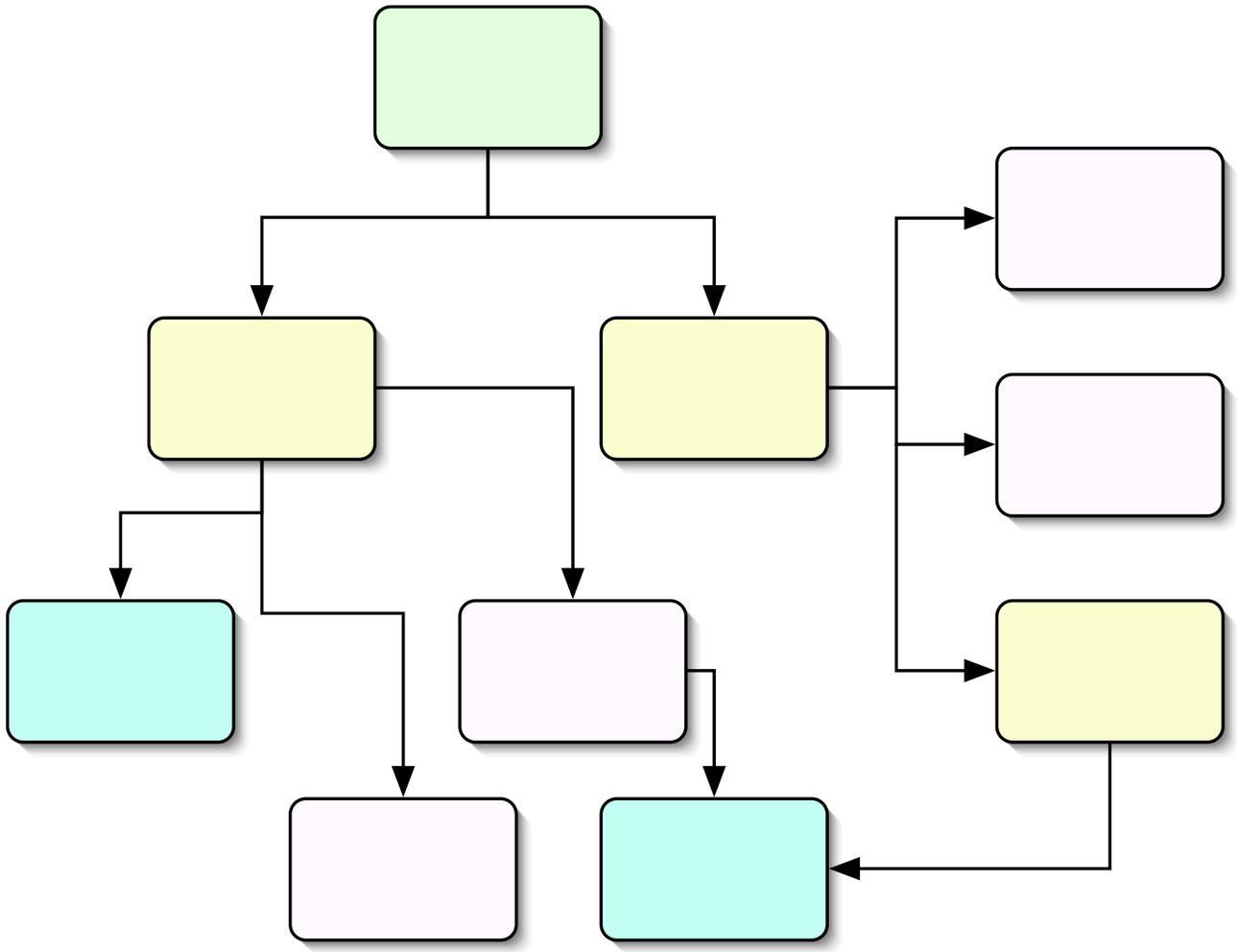

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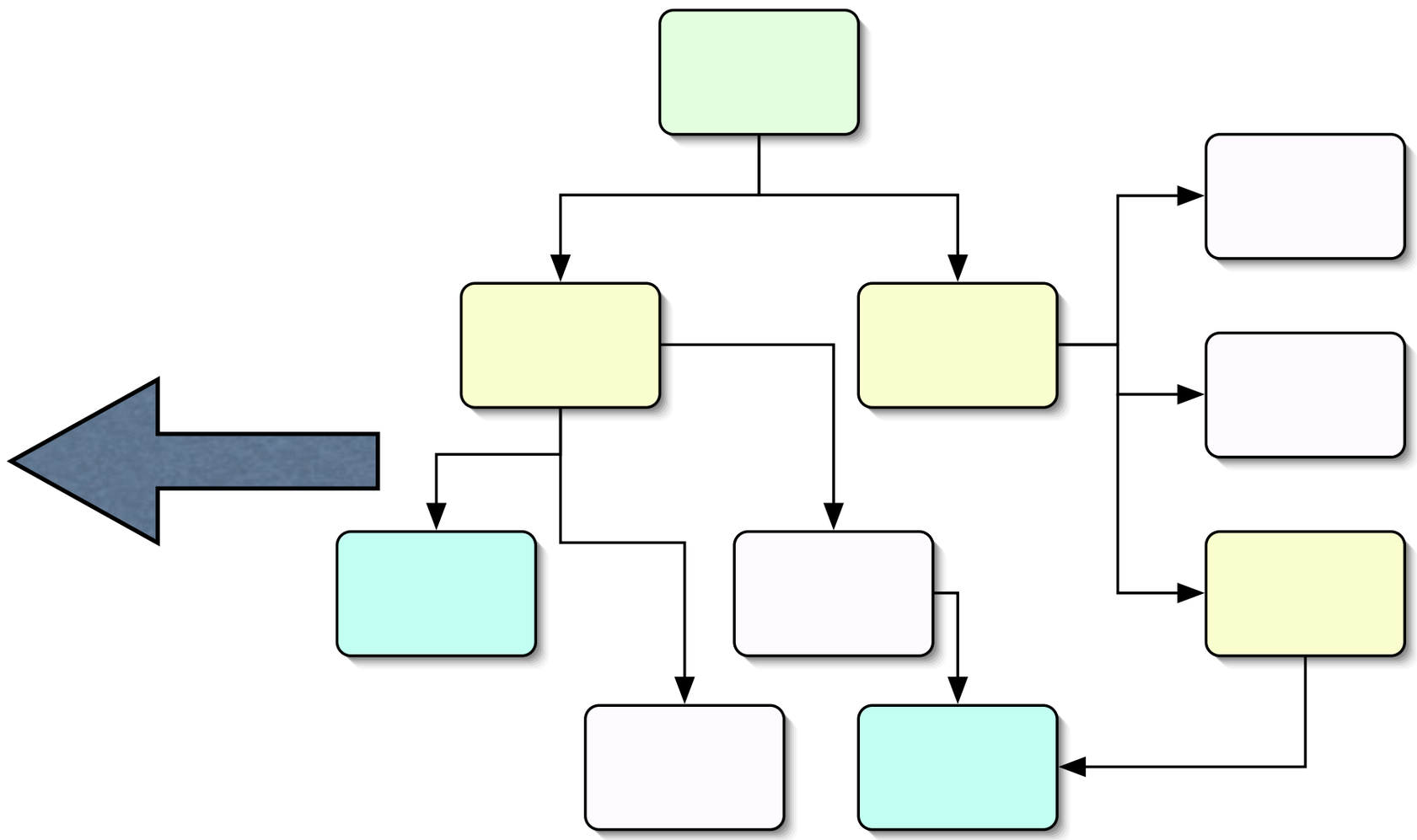

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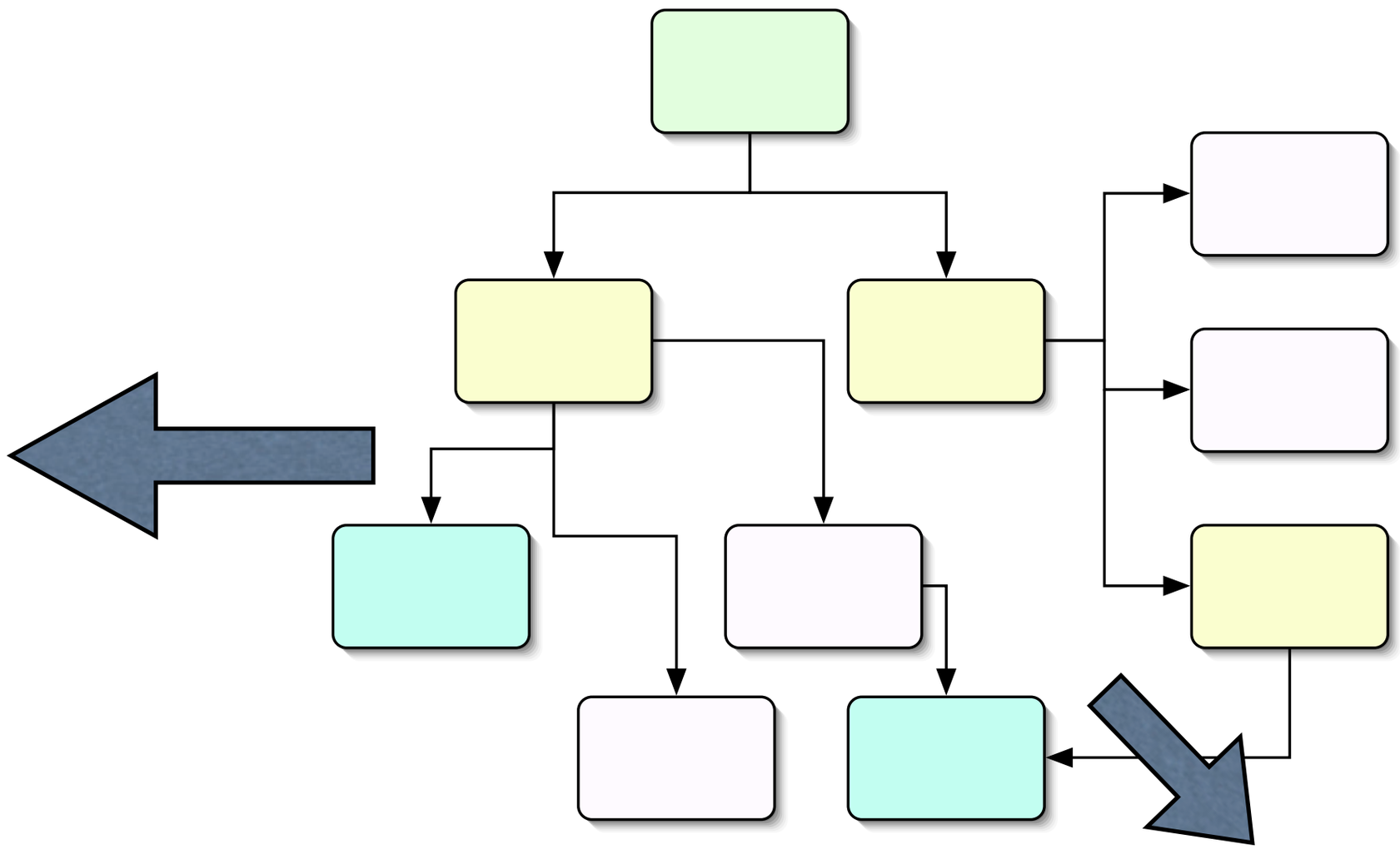

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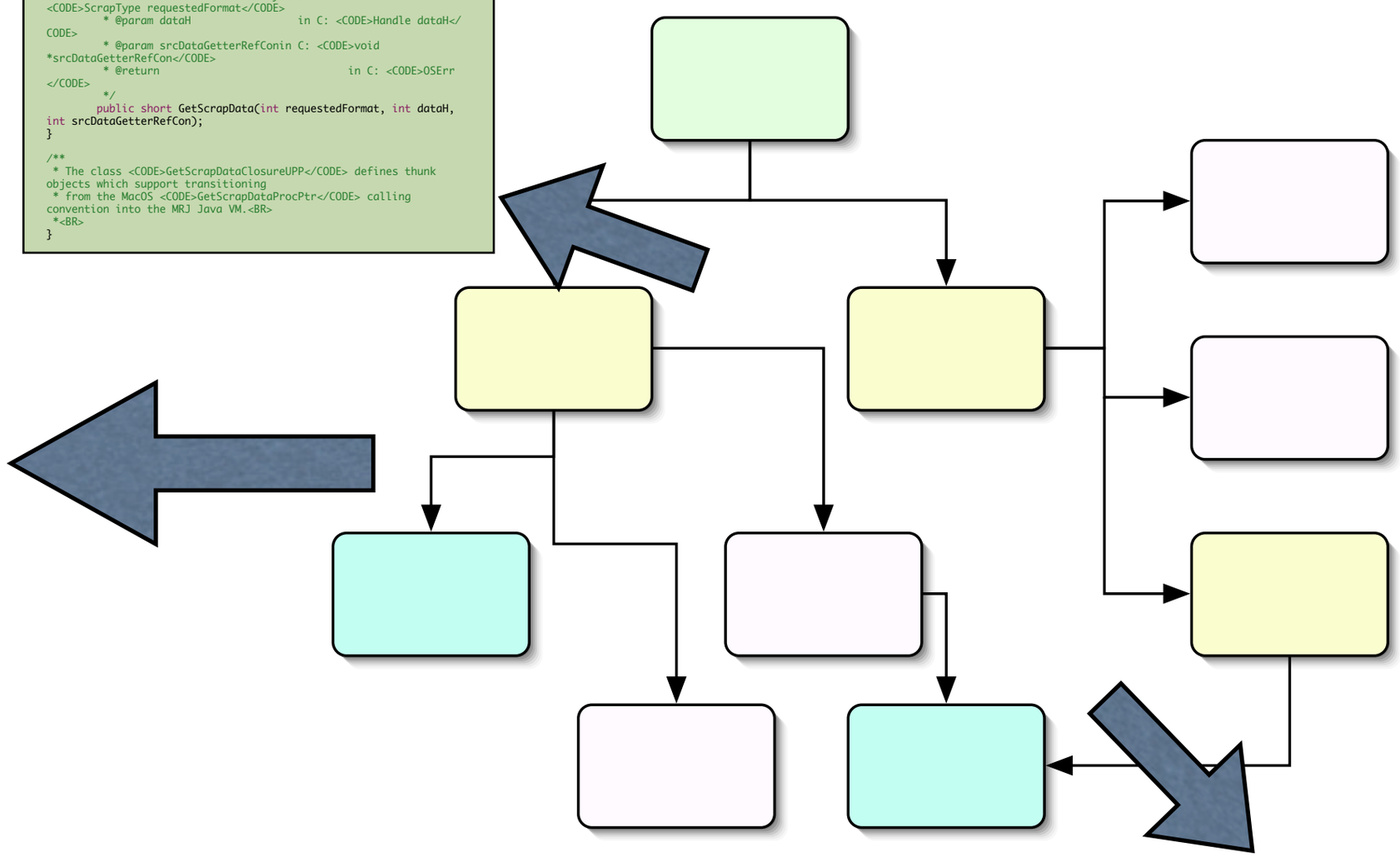

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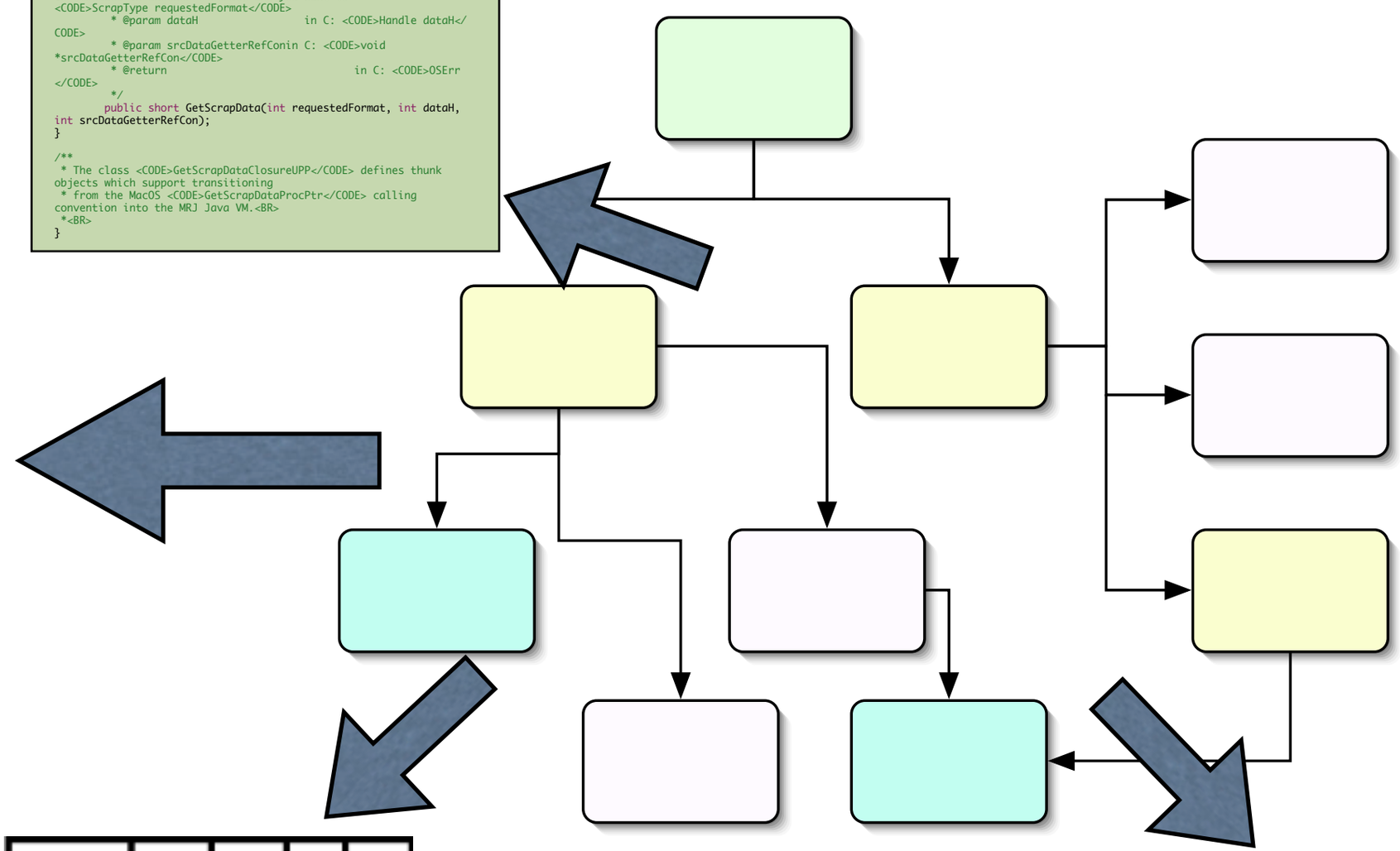

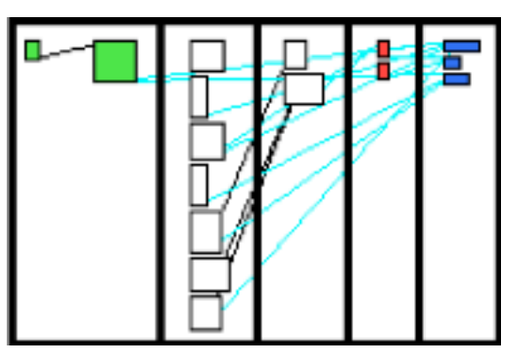

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I mistook a clear vision

for a short distance

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- Program dependencies, *e.g.*,
  - all methods (or statements) that touch a field

What Views are Interesting?

- We need new language features to express new views
  - generic operations (columns) view cannot be expressed in Java — hence Sweet, AspectJ
- Different component-wise decompositions
  - trait view and flat view of a class
- type-annotated view of an implicitly typed language
  - or untyped view of an explicitly-typed language

Consequences

- Many language design questions can be un-asked:
  - keywords *vs.* symbols *vs.* layout
  - type inference *vs.* declaration
- Programming language subsumed by environment

Issues

- Most views are partial
  - *e.g.* extract method refactoring demands a name for the extracted method
  - *e.g.* view of all statements touching a given field
- How does one edit in a partial view?
  - allow the edit only if it is unambiguous?
  - ask the user for guidance?

What views should we choose?

Two approaches:

1. Start with the tools that we have
   - Program slicing, PDGs, structure-folding, etc.
   - Sweet: rows into columns
     - ADT-like view of an OO program
2. Start with a programming task
   - Preferably one that programmers are struggling with!
   - Ask: what views might help?

How to Evaluate Success?

- Evaluations must be *task-centered:*
  - Pick a particular (difficult) programming task
  - See if the multi-view environment helps programmers to do a better job
- Our chosen tasks: program refactorings