Ragged Blocks:
Rendering Structured Text With Style

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PAT Seminar
Friday, Nov 21, 2024

Design Space for Structured Visualizations

Where can structure be expressed?

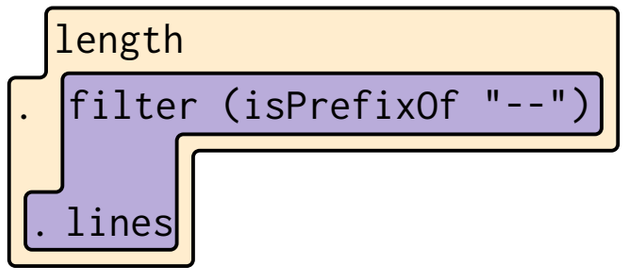
Horizontally and Vertically

Horizontally

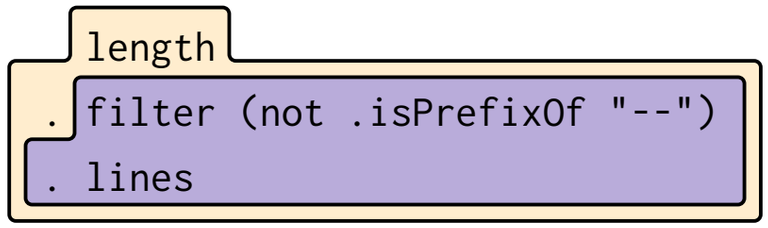
Nowhere

Sandblocks[1†]

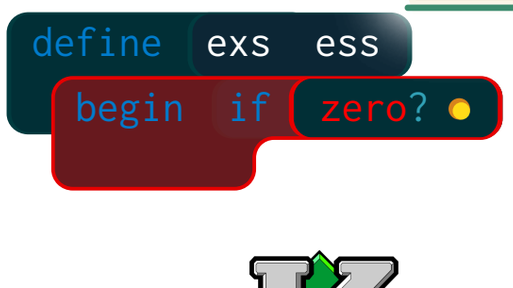
Hass[2] (Prior Work)



Rocks (This System)

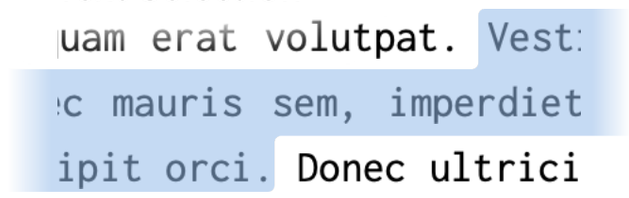


Fructure[3†]



Tylr[4†]

Text Selection



Deuce[5†]

What is the layout primitive?

Boxes

S-Blocks

Ragged Blocks (Rocks)

[1]Tom Beckmann, Patrick Rein, Stefan Ramson, Joana Bergsiek, and Robert Hirschfeld. 2023. Structured Editing for All: Deriving Usable Structured Editors from Grammars.

[2]Cohen and Chugh

[3]Andrew Blinn, 2019. Fructure: A Structured Editing Engine in Racket

[4]D. Moon, A. Blinn and C. Omar. Gradual Structure Editing with Obligations.

[5]Brian Hempel, Justin Lubin, Grace Lu, and Ravi Chugh. 2018. Deuce: a Lightweight User Interface for Structured Editing.

†These images were modified from their original publication to use a consistent font and line width.

A Working Example (S-Blocks)

Input

```
-- Anonymous Authors
module Main where

-- Print a greeting
main =
  putStrLn "Hello, OOPSLA!"
```

a *Syntax Highlighting Style Sheet*

```
main =
  getContents
    >>= print
      . length
      . filter $ isPrefixOf "--"
      . lines
```

b *Type Error Style Sheet*

```
main =
  getContents
    >>= print
      . length
      . filter $ isPrefixOf "--"
      . lines
```

c *Blocks Style Sheet*

```
main =
  getContents
    >>= print
      . length
      . filter $ isPrefixOf "--"
      . lines
```

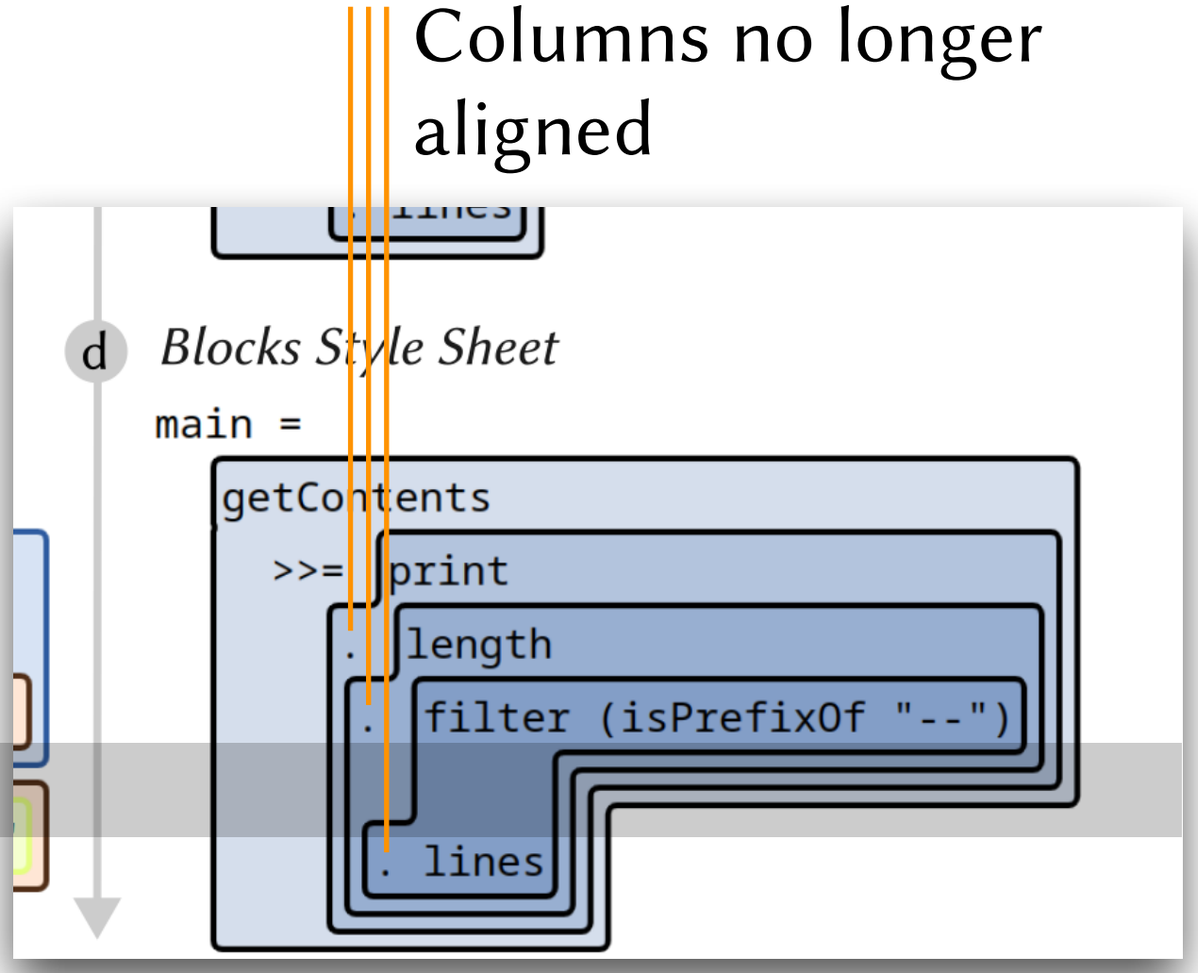
d *Blocks Style Sheet*

```
main =
  getContents
    >>= print
      . length
      . filter (isPrefixOf "--")
      . lines
```

A Working Example (S-Blocks)

- ✓ Text layout looks “natural”
- ✓ Structure is clear
- ✓ Polygon outlines are simple
- ✗ Column alignment is destroyed
- ✗ Not very compact

Columns no longer aligned



Wasted Vertical Space

Cohen and Chugh, Code Style Sheets, (under submission)

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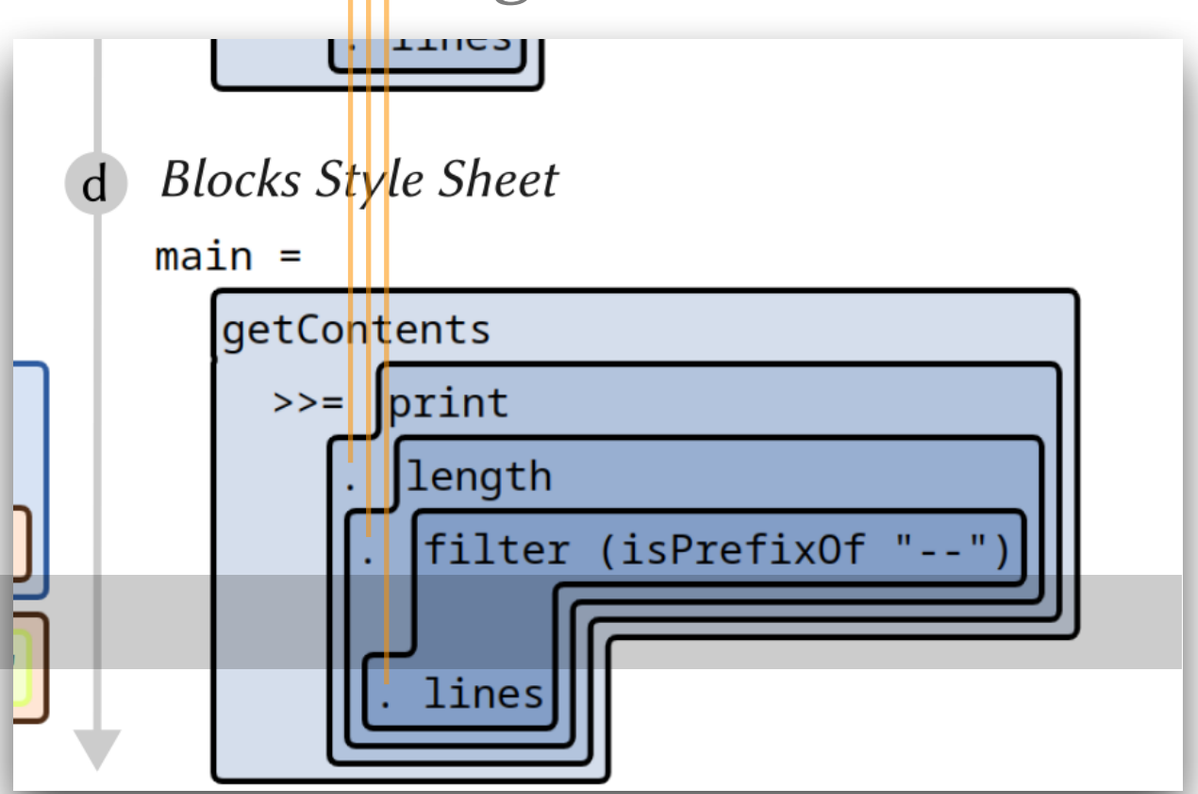

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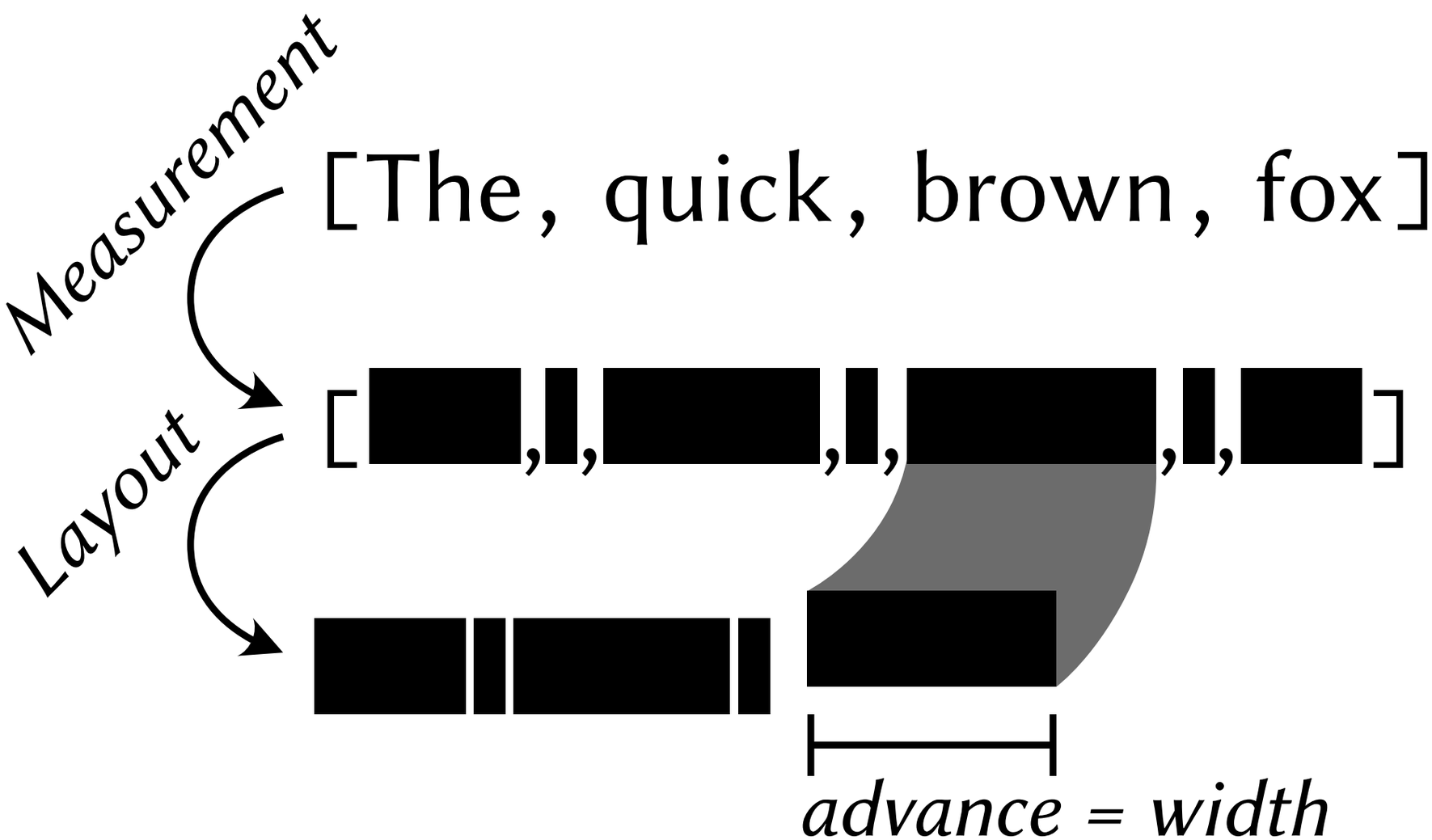
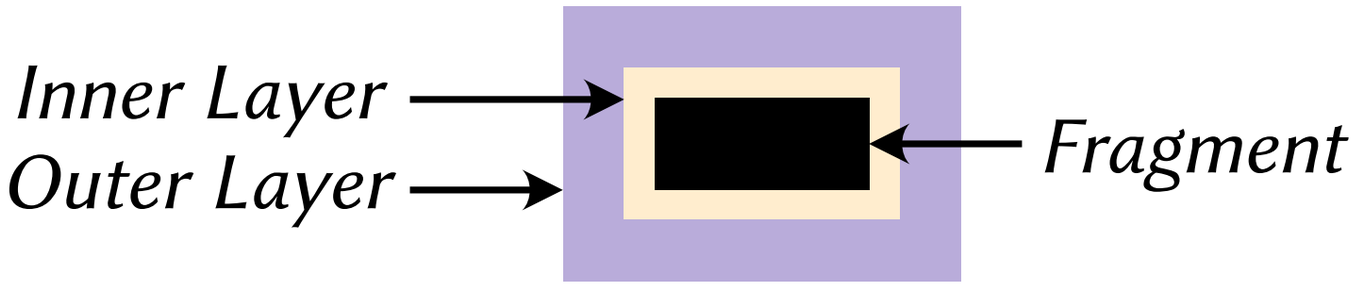
How Does Text Layout Normally Work?



Big Idea: Regions



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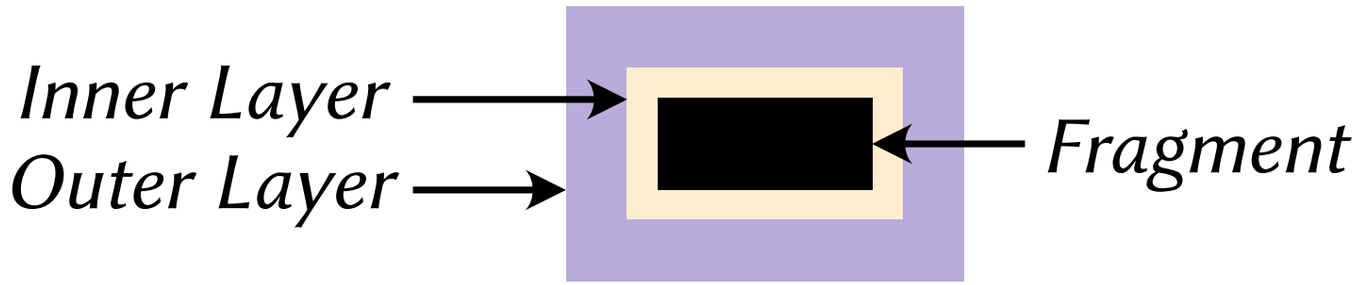

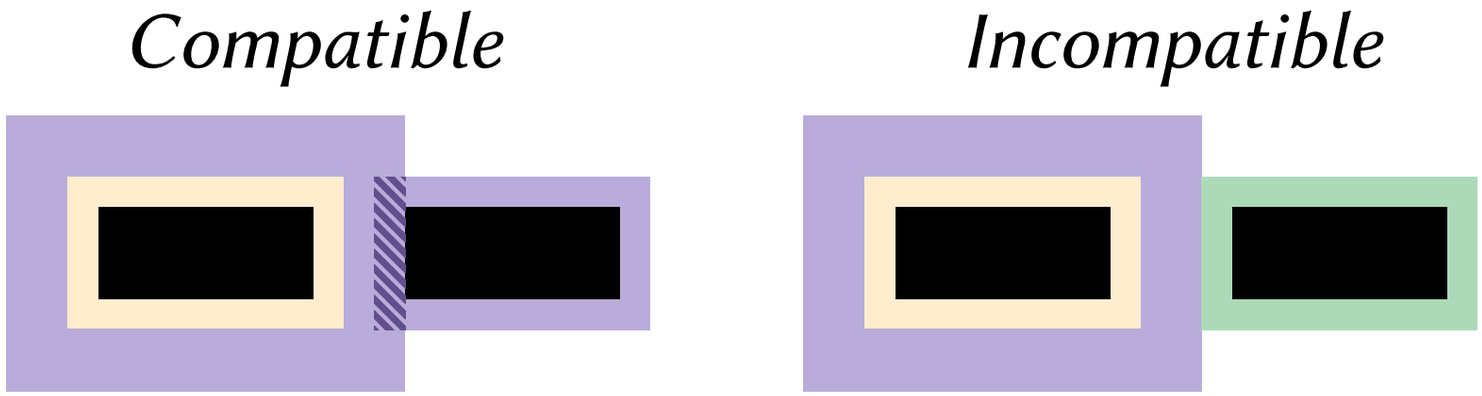

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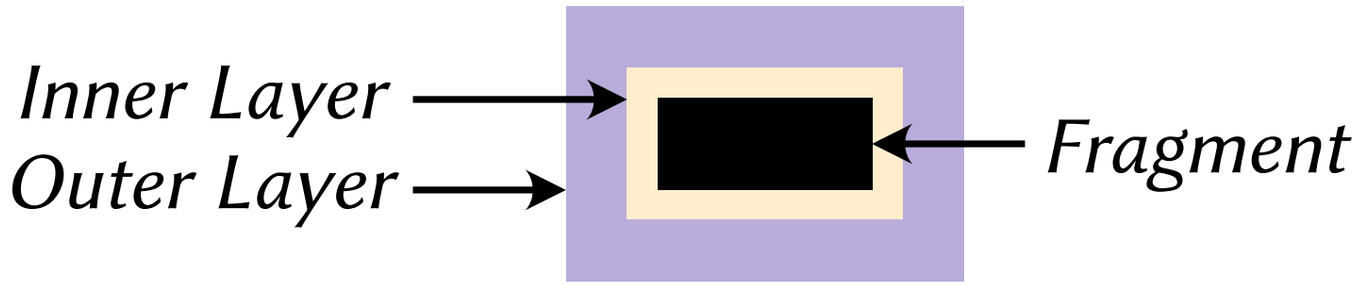

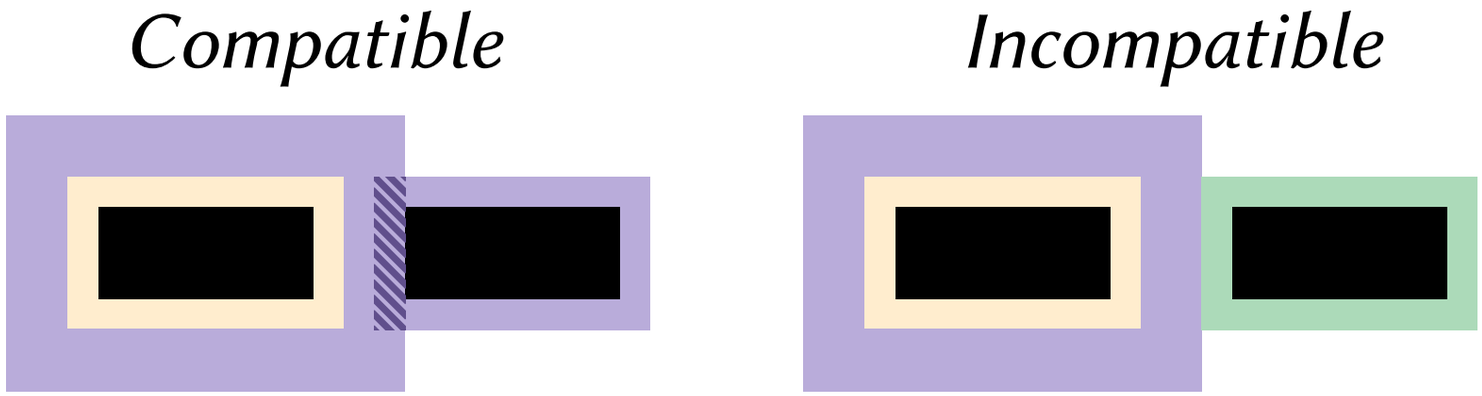

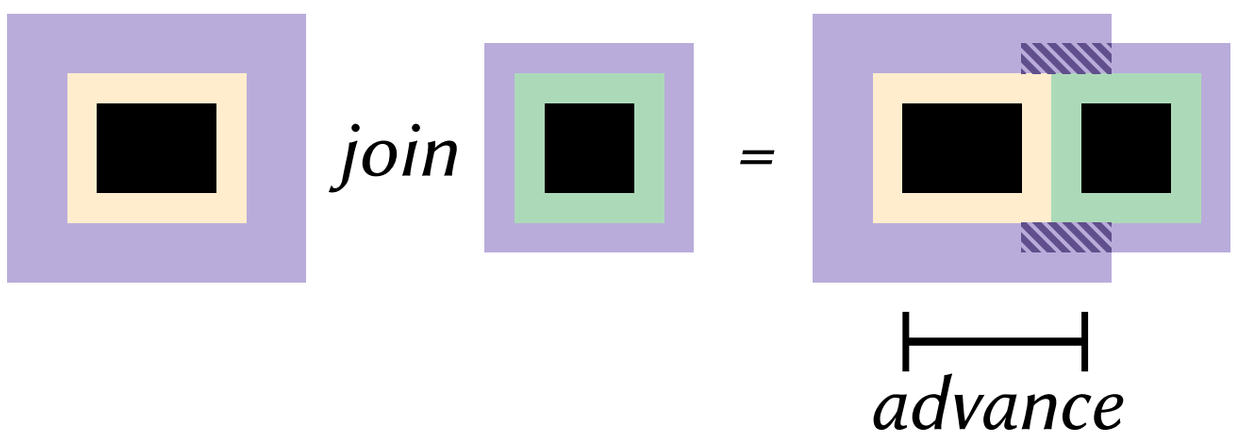

Using Regions to Implement Layout

```
fact 0 = 1
fact n = n * fact (n - 1)
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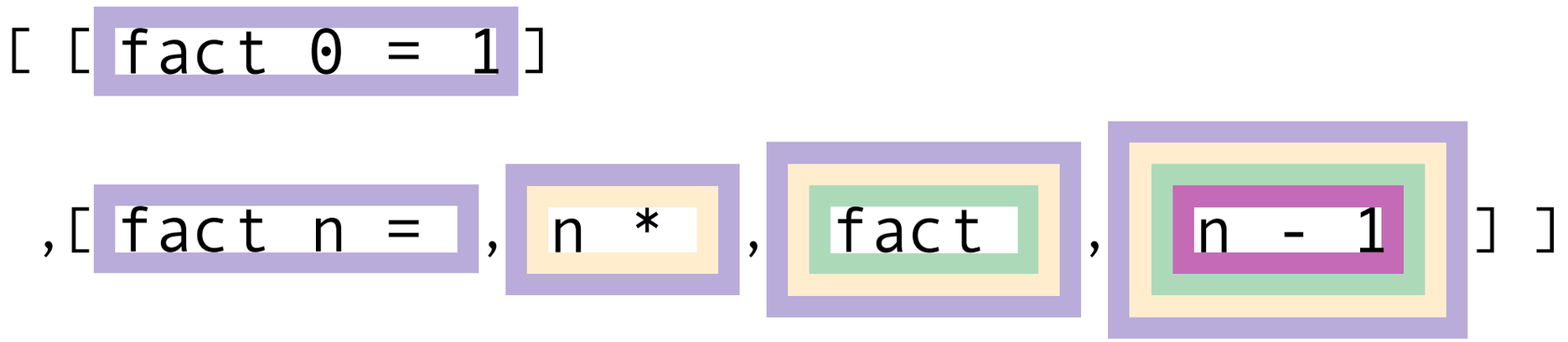

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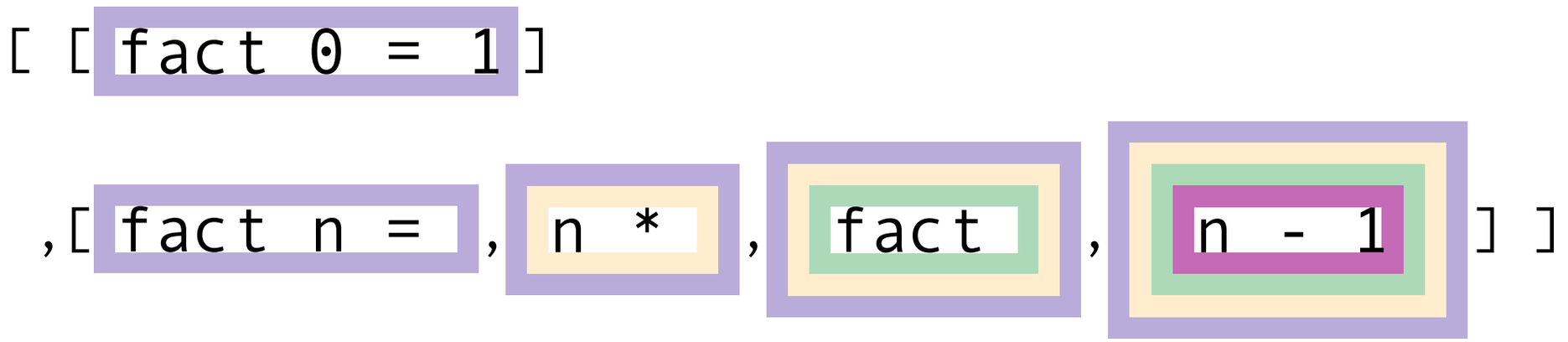

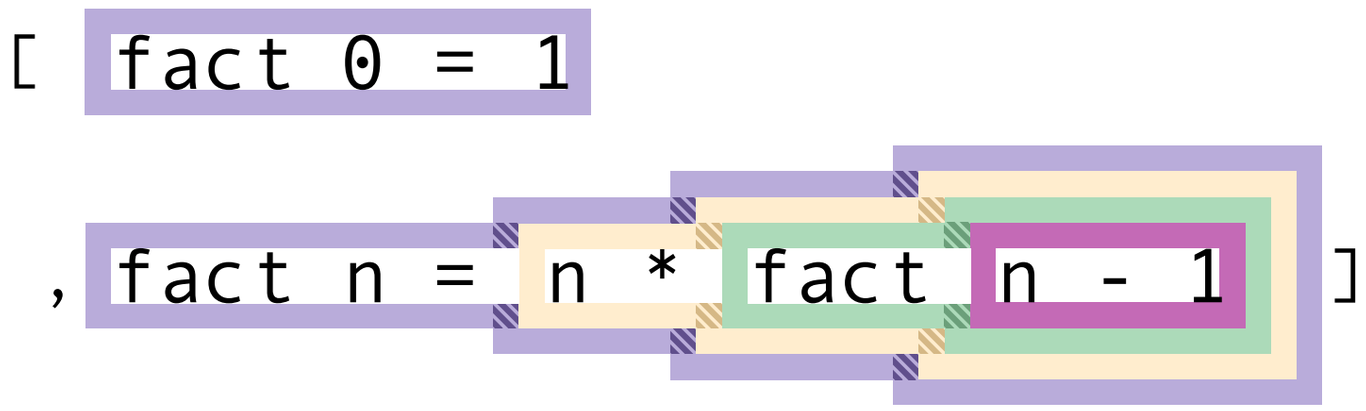

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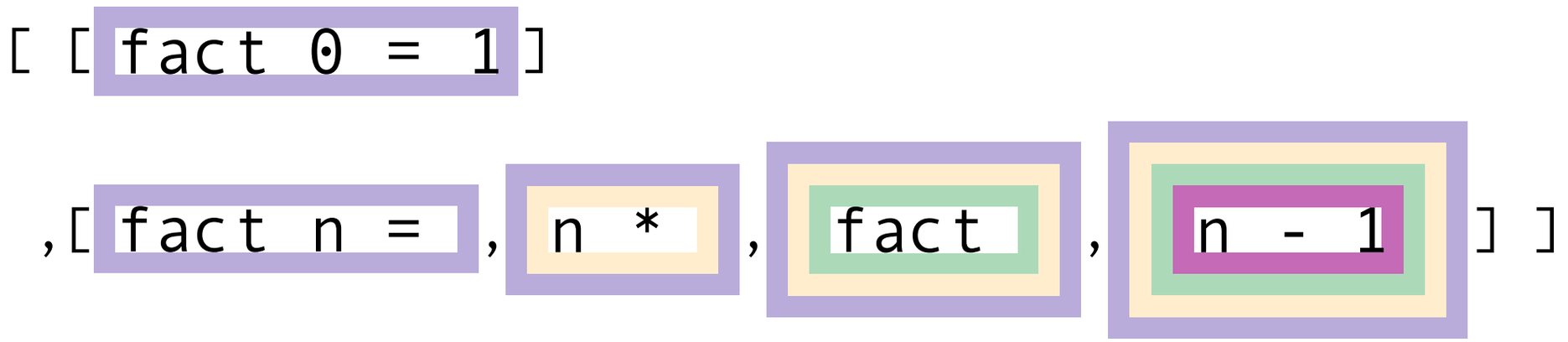

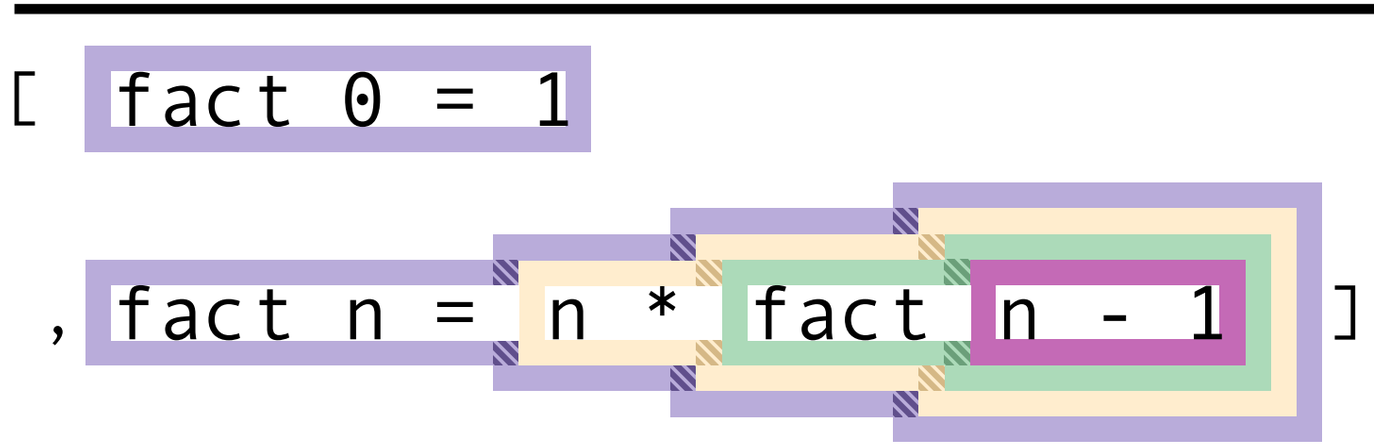

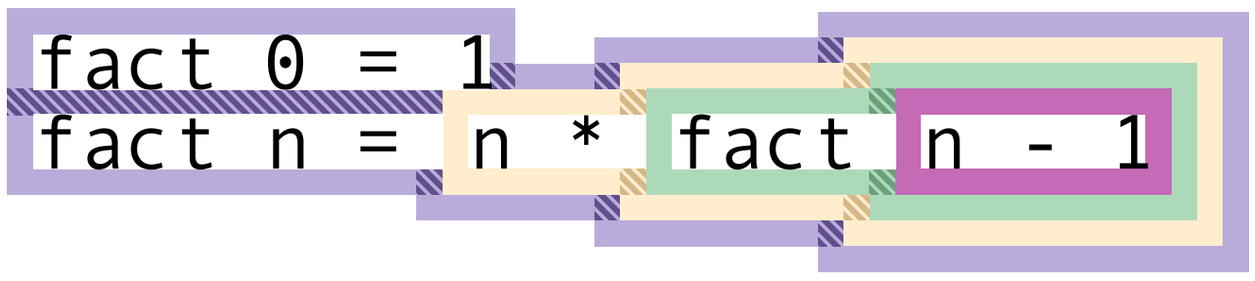

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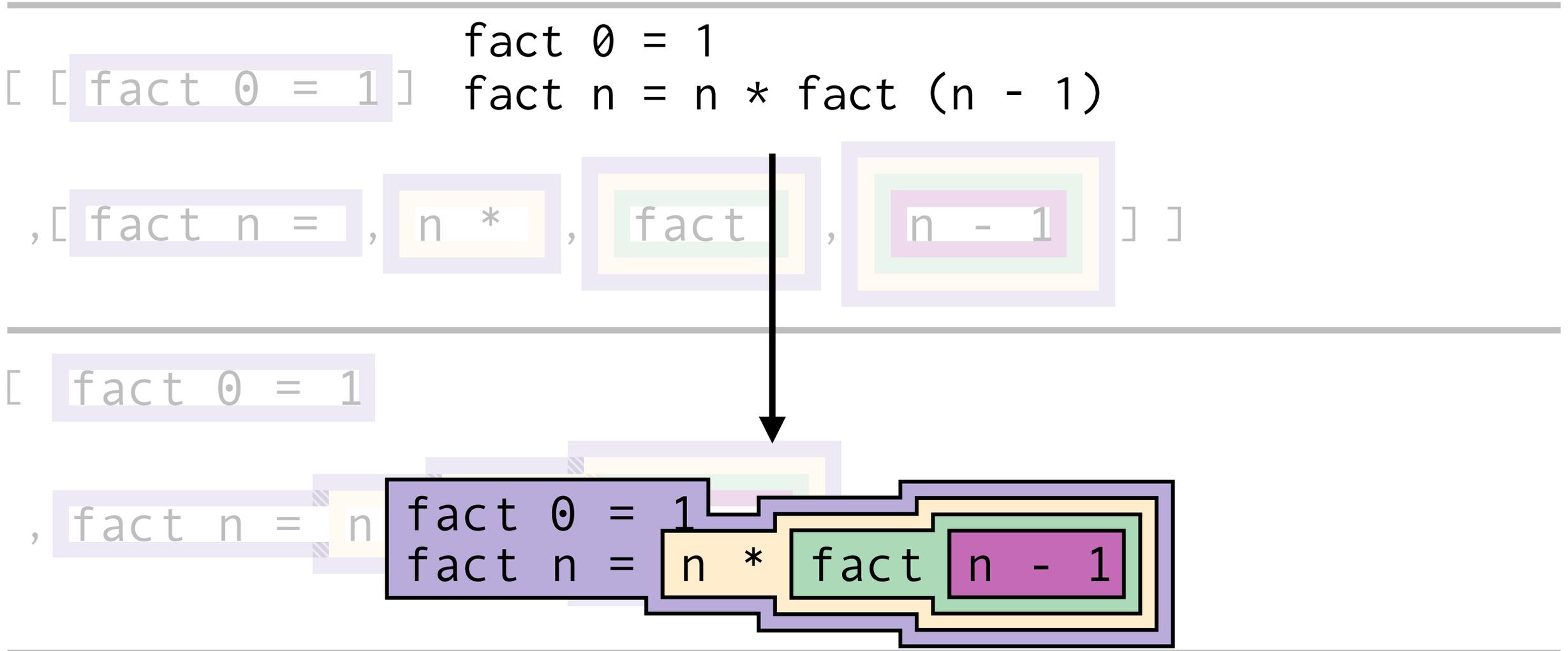
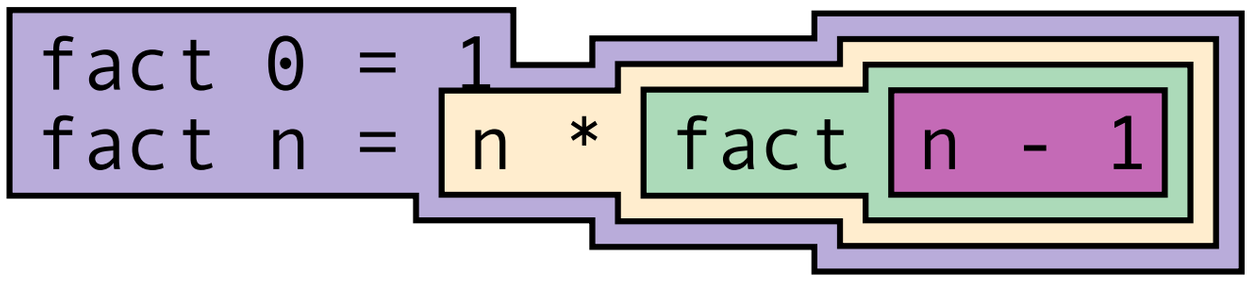
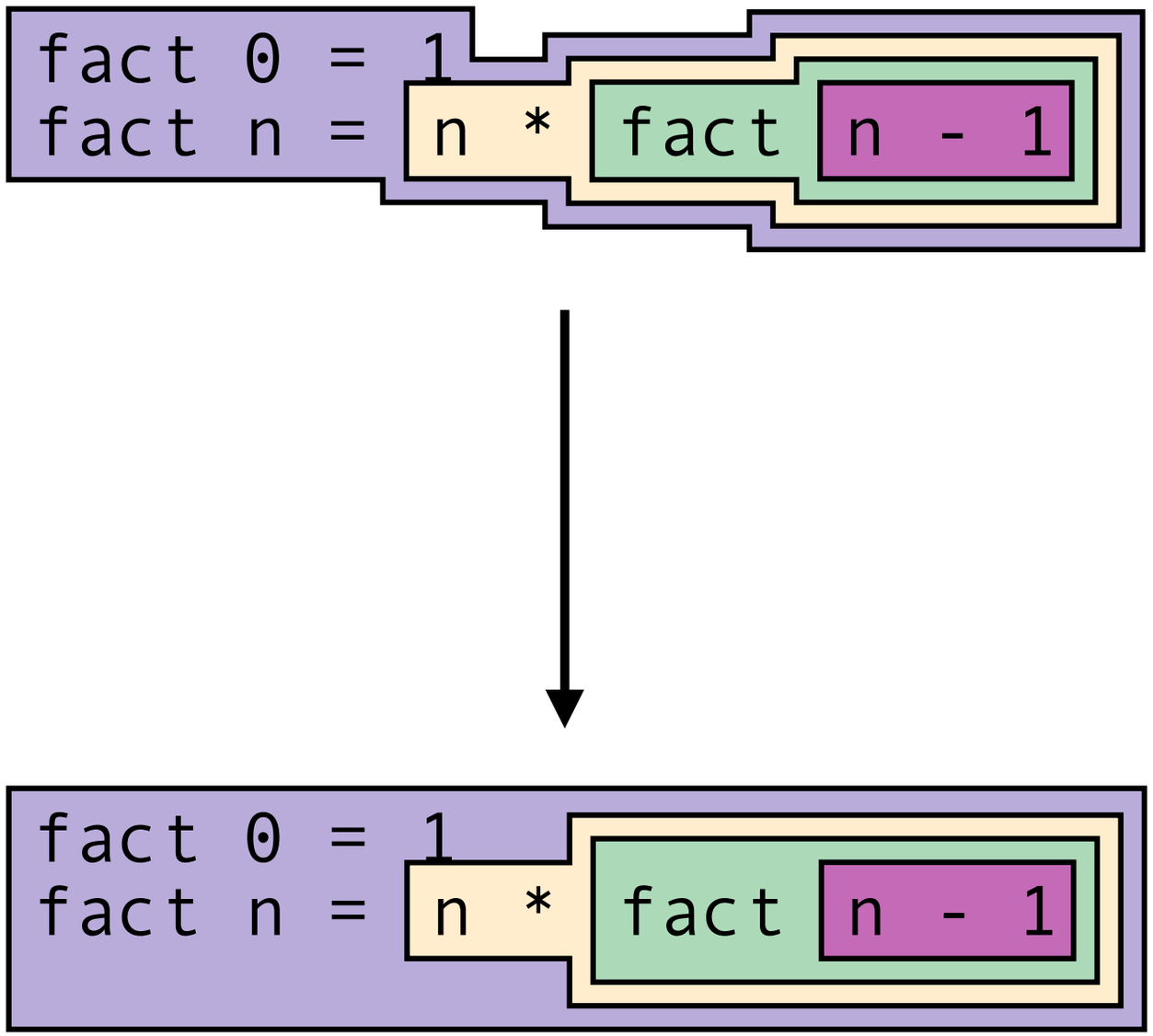


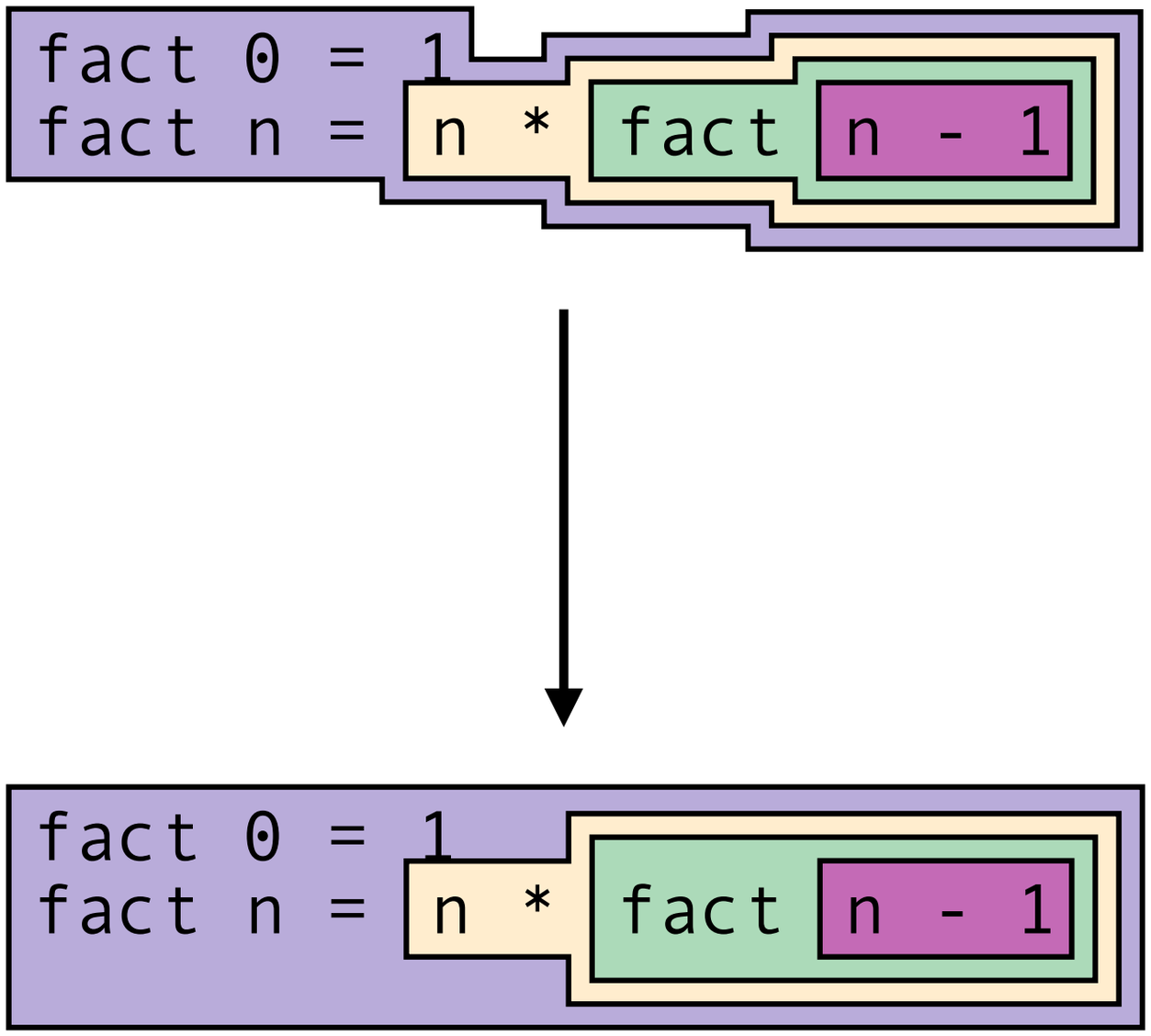
- ✓ Text layout looks “natural”
- ✓ Structure is clear
- ✗ Polygon outlines are simple
- ✗ Columns can be aligned (you’ll have to take my word for it)
- ✓ Compact!



Simplification



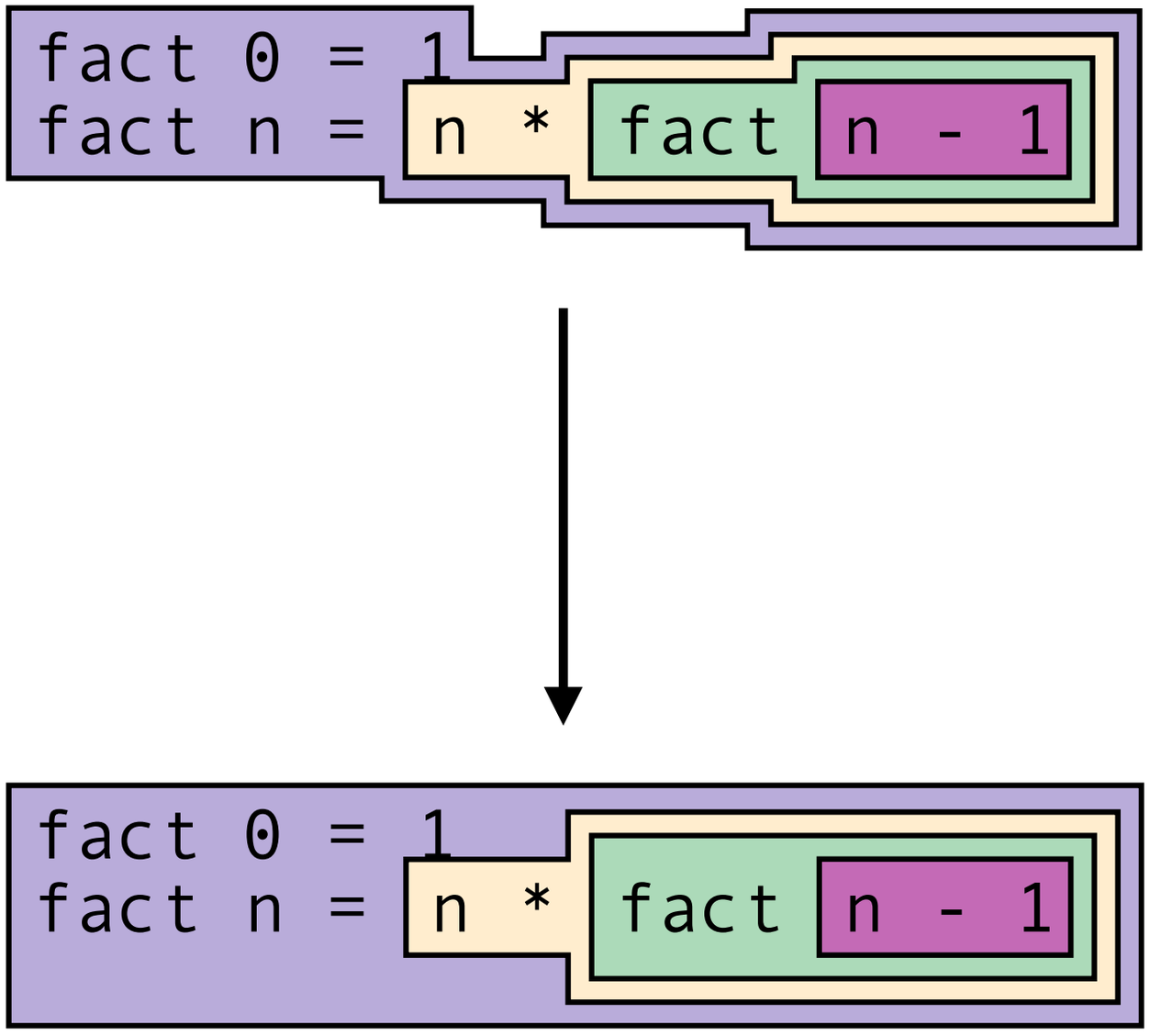
Simplification



*Still a lot to think about in this area.

Simplification

Thank You!



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