Fizzbuzz

...and Embedded DSLs — obviously.

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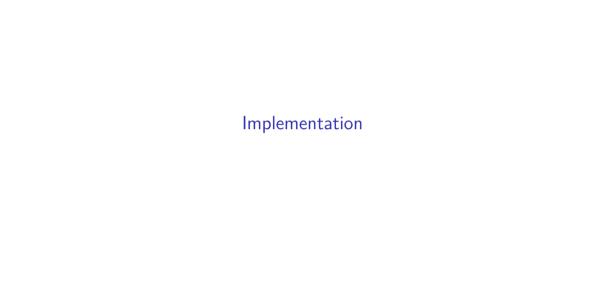
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What's that anyway?

One, Two, Fizz, Four, Buzz, Fizz, …, Fourteen, FizzBuzz, …

Implementation

The Embedded Domain Specific Language

The Embedded Domain Specific Language

$c ::= \text{SKIP} \mid \text{HALT} \mid \text{PRINT } s$

$p ::= c; p \mid \epsilon$

The Embedded Domain Specific Language

$$[\![\text{SKIP}; p]\!] = [\![p]\!]$$
$$[\![\text{HALT}; p]\!] = [\![\epsilon]\!] = ""$$
$$[\![\text{PRINT } s; p]\!] = s + [\![p]\!]$$

Contexts as Building Blocks

$\langle \mathrm{PRINT}\ "keep"; \bullet; \mathrm{PRINT}\ "calm" \rangle$

Contexts as Building Blocks

$\langle \text{PRINT "keep"}; \bullet; \text{PRINT "calm"} \rangle [\![\text{PRINT "nervous and never"}]\!]$
$= [\![\text{PRINT "keep"}; \text{PRINT "nervous and never"}; \text{PRINT "calm"}]\!]$

$\langle \text{SKIP}; \bullet; \text{PRINT 0} \rangle \circ \langle \text{HALT}; \bullet \rangle$
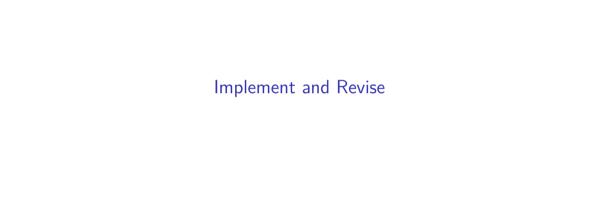$= \langle \text{SKIP}; \text{HALT}; \bullet; \text{PRINT 0} \rangle$

Fizzbuzz Contexts

$$base(n) = \langle \bullet; \ \mathrm{PRINT}\ n\rangle$$

$$fizz(n) = \begin{cases} \langle \mathrm{PRINT}\ "\textit{fizz}"; \ \bullet; \ \mathrm{HALT}\rangle & \textit{if n divisible by 3} \\ \langle \bullet \rangle \end{cases}$$

$$buzz(n) = \begin{cases} \langle \mathrm{PRINT}\ "\textit{buzz}"; \ \bullet; \ \mathrm{HALT}\rangle & \textit{if n divisible by 5} \\ \langle \bullet \rangle \end{cases}$$

$$fb(n) = (base(n) \circ fizz(n) \circ buzz(n))\ [\![SKIP]\!]$$

Implement and Revise

Fin.