

Fizzbuzz

...and Embedded DSLs — obviously.

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Fizzbuzz

What's that anyway?

Fizzbuzz

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

Implementation

The Embedded Domain Specific Language

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

The Embedded Domain Specific Language

$$\llbracket \text{SKIP}; p \rrbracket = \llbracket p \rrbracket$$

$$\llbracket \text{HALT}; p \rrbracket = \llbracket \epsilon \rrbracket = ""$$

$$\llbracket \text{PRINT } s; p \rrbracket = s ++ \llbracket p \rrbracket$$

Contexts as Building Blocks

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

Contexts as Building Blocks

$$\begin{aligned} & \langle \text{PRINT } "keep"; \bullet; \text{PRINT } "calm" \rangle (\text{PRINT } "nervous and never") \\ &= \text{PRINT } "keep"; \text{PRINT } "nervous and never"; \text{PRINT } "calm" \end{aligned}$$

$$\begin{aligned} & \langle \text{SKIP}; \bullet; \text{PRINT } 0 \rangle \circ \langle \text{HALT}; \bullet \rangle \\ &= \langle \text{SKIP}; \text{HALT}; \bullet; \text{PRINT } 0 \rangle \end{aligned}$$

Fizzbuzz Contexts

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

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

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

$$fb(n) = (base(n) \circ fizz(n) \circ buzz(n)) \text{ SKIP}$$

Implement and Revise

Fin.