Fizzbuzz

...and Embedded DSLs — obviously.

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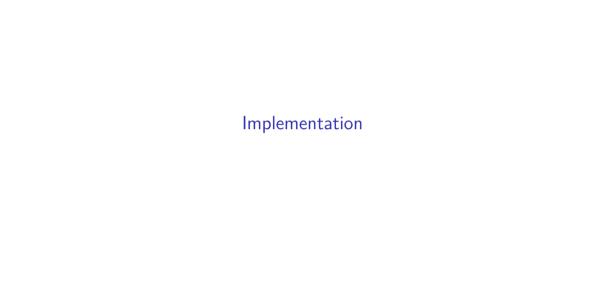
July 9, 2019

Fizzbuzz

What's that anyway?

Fizzbuzz

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



The Embedded Domain Specific Language

The Embedded Domain Specific Language

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

The Embedded Domain Specific Language

```
\begin{aligned} & [\![ \text{SKIP}; \rho ]\!] = [\![ \rho ]\!] \\ & [\![ \text{HALT}; \rho ]\!] = [\![ \epsilon ]\!] = "" \\ & [\![ \text{PRINT} \ s; \rho ]\!] = s +\!\!+ [\![ \rho ]\!] \end{aligned}
```

Contexts as Building Blocks

⟨PRINT "keep"; •; PRINT "calm"⟩

Contexts as Building Blocks

```
\langle PRINT "keep"; \bullet; PRINT "calm" \rangle (PRINT "nervous and never") = PRINT "keep"; PRINT "nervous and never"; 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
```

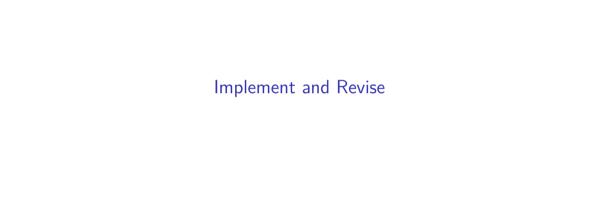
Fizzbuzz Contexts

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

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

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

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



Fin.