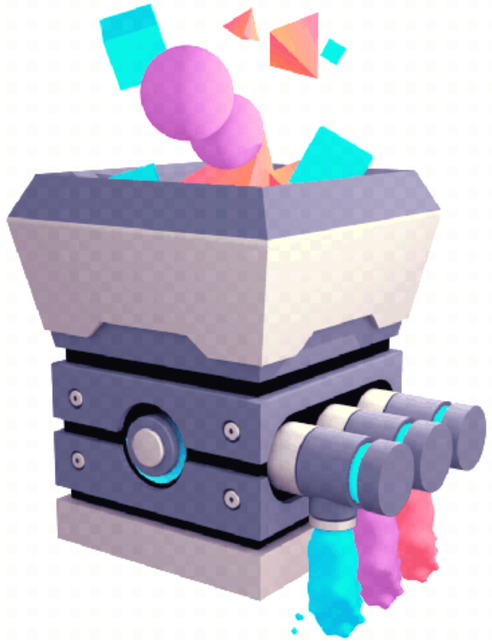

Halunke
.jetzt

INNOQ



Lucas

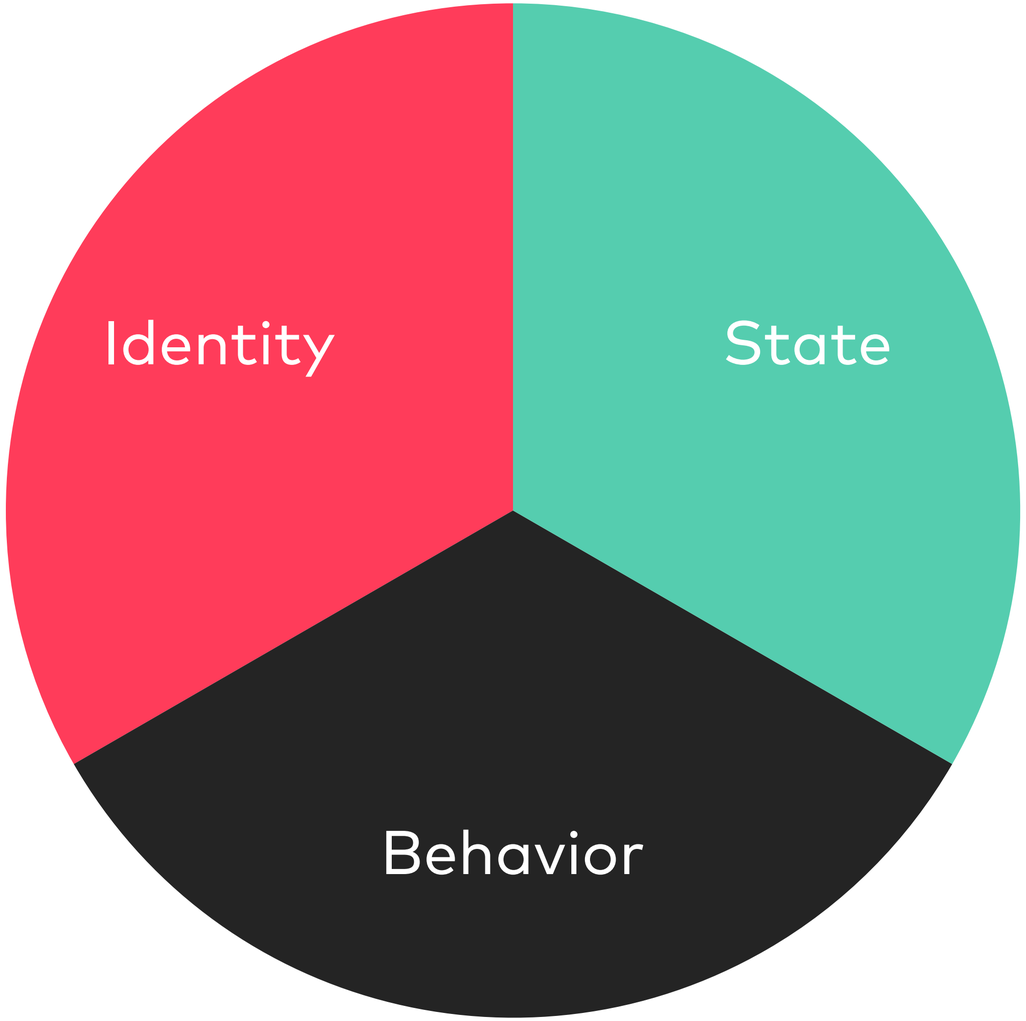
faucet-pipeline.org

complate

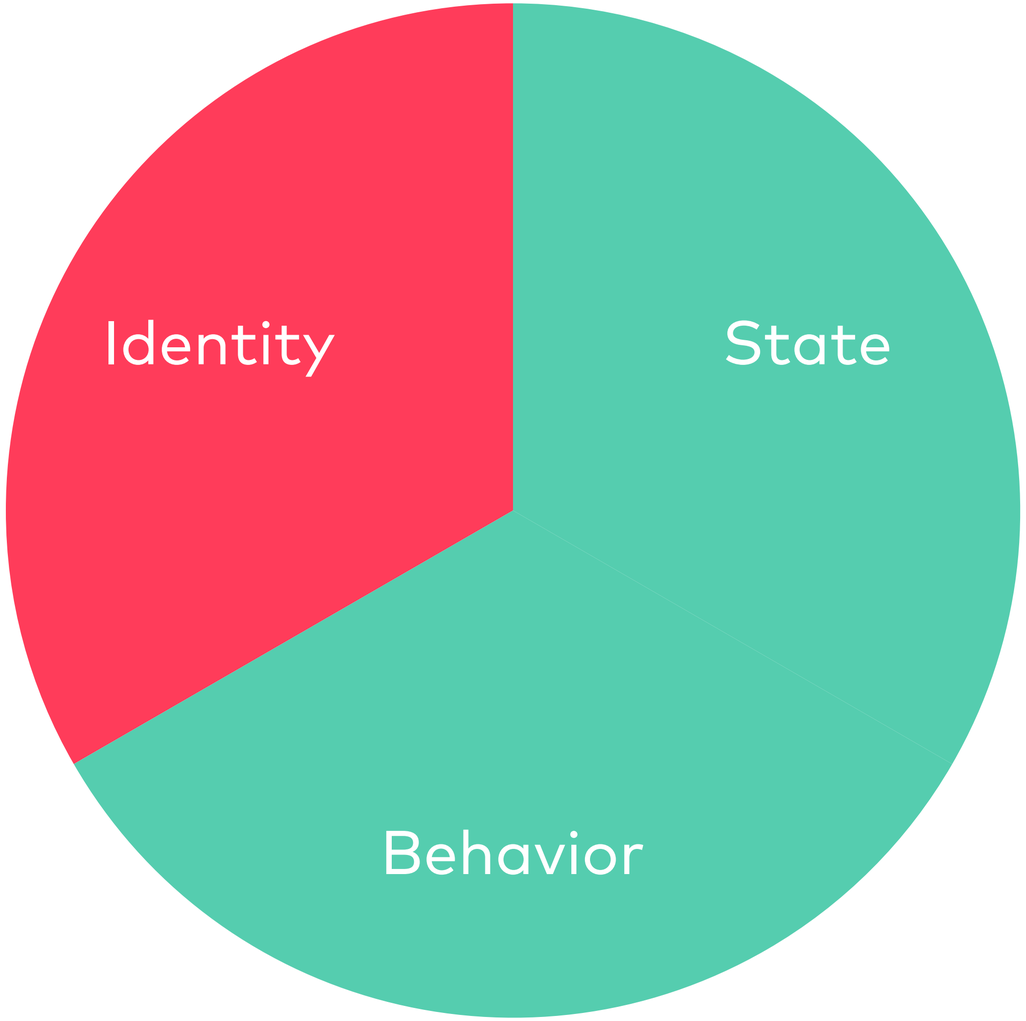
Part 1:
Motivation

"FP vs. OO"

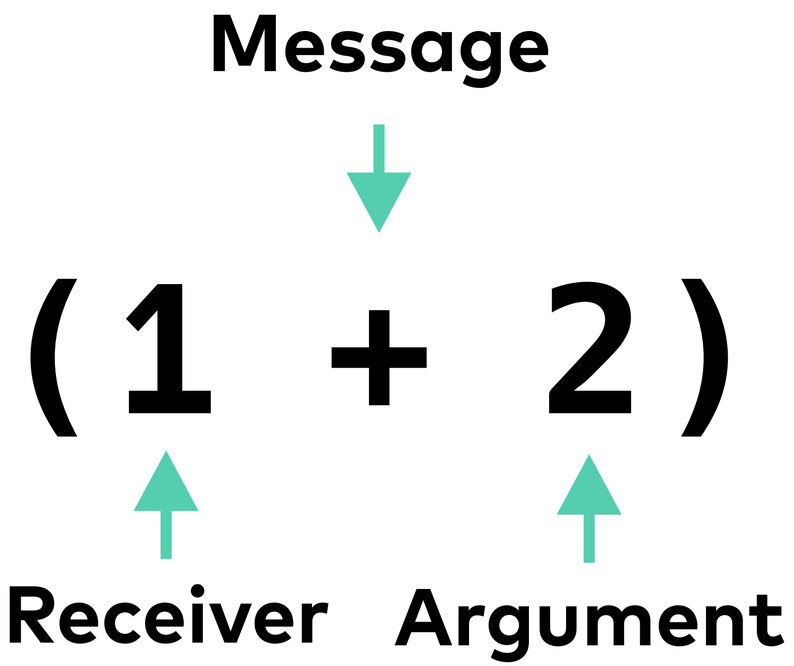
In Clojure...

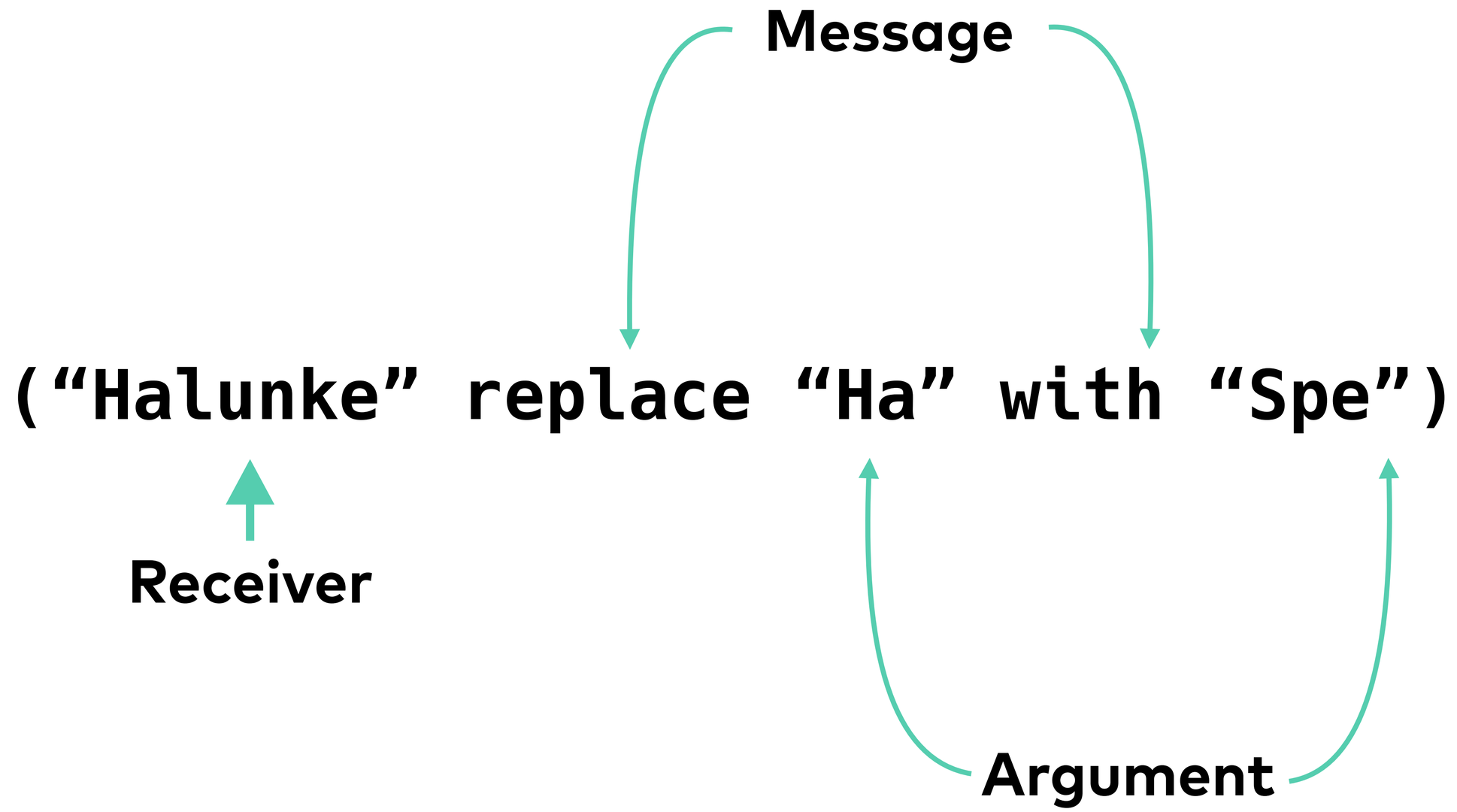


In Halunke...



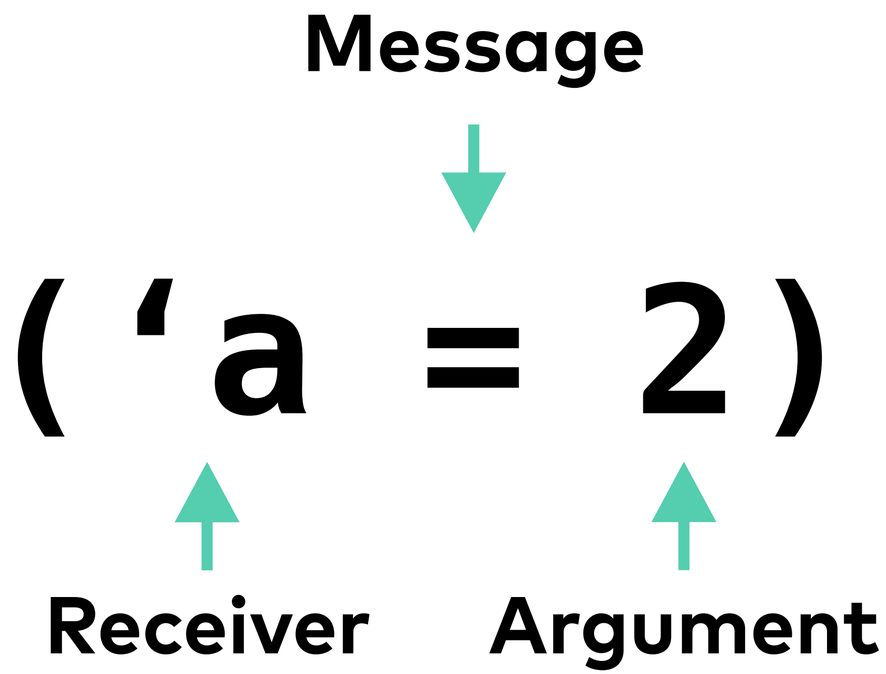
Part 2:
The Language


Message
(1 + 2)
Receiver
Argument


Message
("Halunke" replace "Ha" with "Spe")
Receiver
Argument

```
(“Halunke” replace “Ha” with “Spe”)
```

Sends “Halunke”
the message “replace with”
with the arguments [“Ha” “Spe”]


Message
(‘a = 2)
Receiver
Argument

- All objects are immutable
- A reference created with ‘a can’t be reassigned
- In the future, there will be reassignable references with @a

- ☑ No nil/null
- ☑ REPL
- ☑ Define own functions
- ☑ Define own classes
- ☑ Conditionals are messages, not syntax
- ☑ Number, String, Array, Dictionary, Regexp
- ☑ Web Module & a tiny Routing Lib

Currently in Development

```
('a = 12)
('my = "str")

("hello" replace (my replac "i" wit "a") with "mumpf")

(stdio puts "a")
```

```
4 | ("hello" replace (my replac "i" wit "a") with "mumpf")
                     ^^^^^^^^^^^^^^^^^^^^^^^^

The String "str" received the message `replac wit`. It doesn't know how to handle that.
Did you mean `replace with`?
```

Live Demo :)

Part 3: Implementation

Written in Ruby!

(“Halunke” replace “Ha” with “Spe”)

Lexer

```
a = Halunke::Lexer.new
a.tokenize(‘(“Halunke“ replace “Ha“ with “Spe“)‘)

⇒ [[:OPEN_PAREN, “(“],
    [:STRING, “Halunke“],
    [:BAREWORD, “replace“],
    [:STRING, “Ha“],
    [:BAREWORD, “with“],
    [:STRING, “Spe“],
    [:CLOSE_PAREN, “)“]]
```

Lexer (with Ragel)

1. Define Tokens

```
string = '"' [^"]* '"';
bareword = [a-zA-Z_]+ | '+' | '-' | '*' | '/' | '<' | '>' | '=' | '@';
open_paren = '(';
close_paren = ')';
```

Lexer (with Ragel)

2. React to tokens

```
string ⇒ { emit(:STRING, data[ts+1 ... te-1]) };
bareword ⇒ { emit(:BAREWORD, data[ts ... te]) };
open_paren ⇒ { emit(:OPEN_PAREN, data[ts ... te]) };
close_paren ⇒ { emit(:CLOSE_PAREN, data[ts ... te]) };
space;
any ⇒ { raise "Could not lex '#{ data[ts ... te] }'" };
```

Parser

```
b = Halunke::Parser.new
b.parse('("Halunke" replace "Ha" with “Spe")')
```

```
⇒ #<struct Halunke::Nodes nodes=[
    #<struct Halunke::MessageSendNode
      receiver=#<struct Halunke::StringNode value=“Halunke">,
      message=#<struct Halunke::MessageNode nodes=[
        #<struct Halunke::BarewordNode value=“replace">,
        #<struct Halunke::StringNode value=“Ha">,
        #<struct Halunke::BarewordNode value=“with">,
        #<struct Halunke::StringNode value=“Spe">
      ]>
    >
  ]>
```

Parser (with racc)

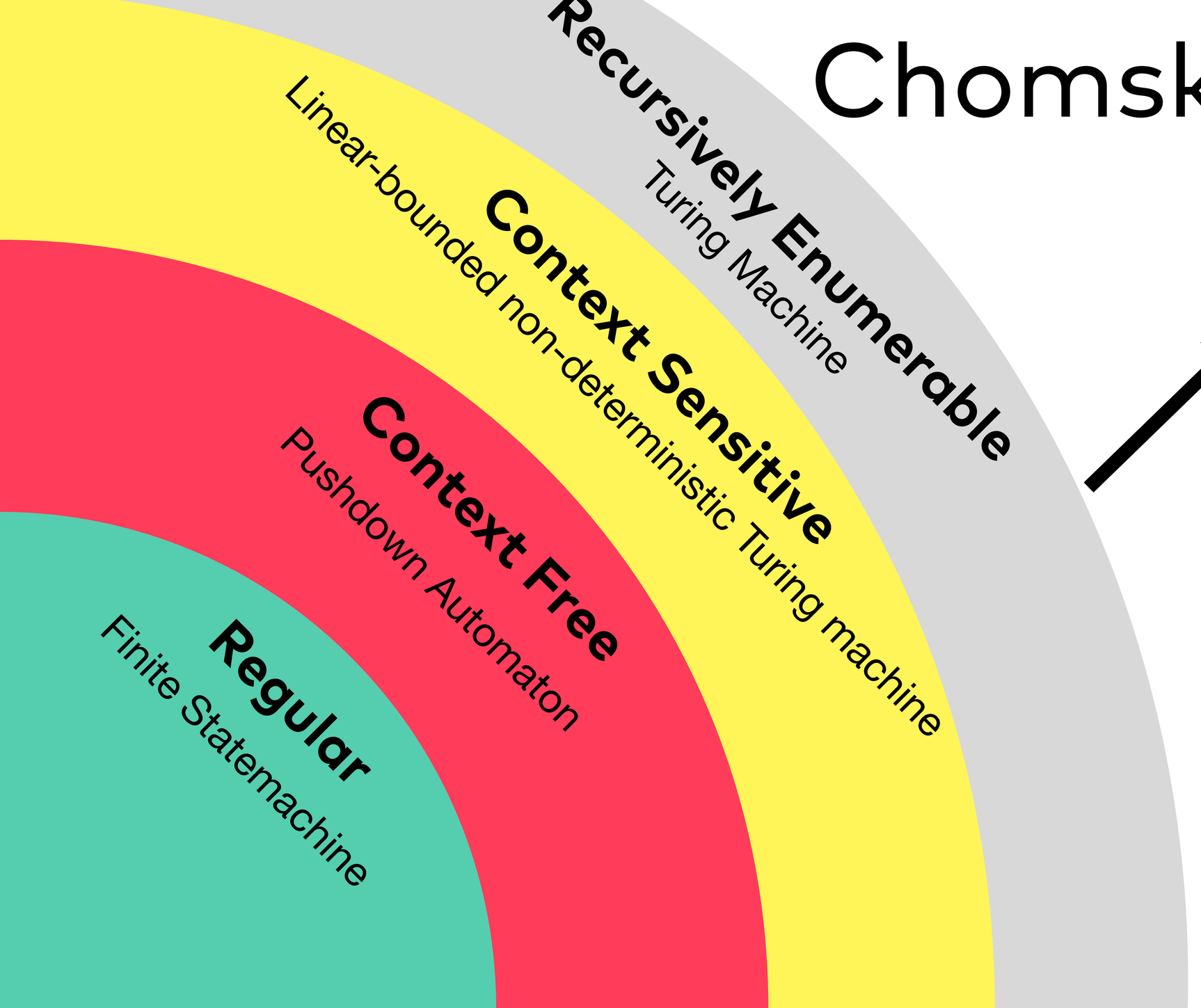
```
Program:
  Expressions { val[0] }
;

Expressions:
  /* empty */             { Nodes.new([]) }
| Expression Expressions { Nodes.new([val[0]].concat(val[1].nodes)) }
;

Expression:
  STRING                                          { StringNode.new(val[0]) }
| BAREWORD                                        { BarewordNode.new(val[0]) }
| OPEN_PAREN Expression Expressions CLOSE_PAREN   { MessageSendNode.new(val[1], val[2].to_message) }
;
```

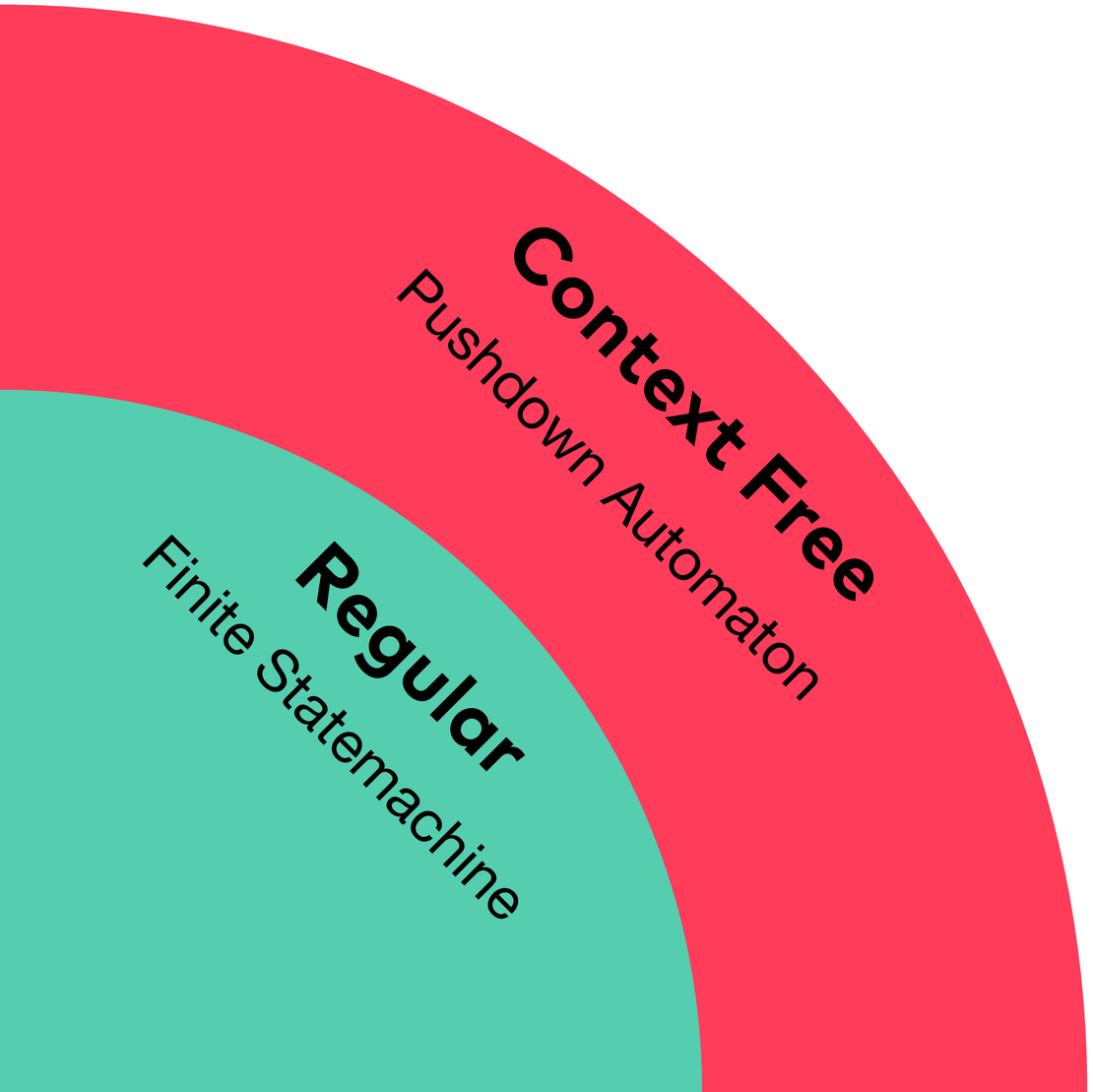
Why doesn't the parser just lex as well?

Chomsky hierarchy



More powerful,
less guarantees,
less performance

Chomsky hierarchy



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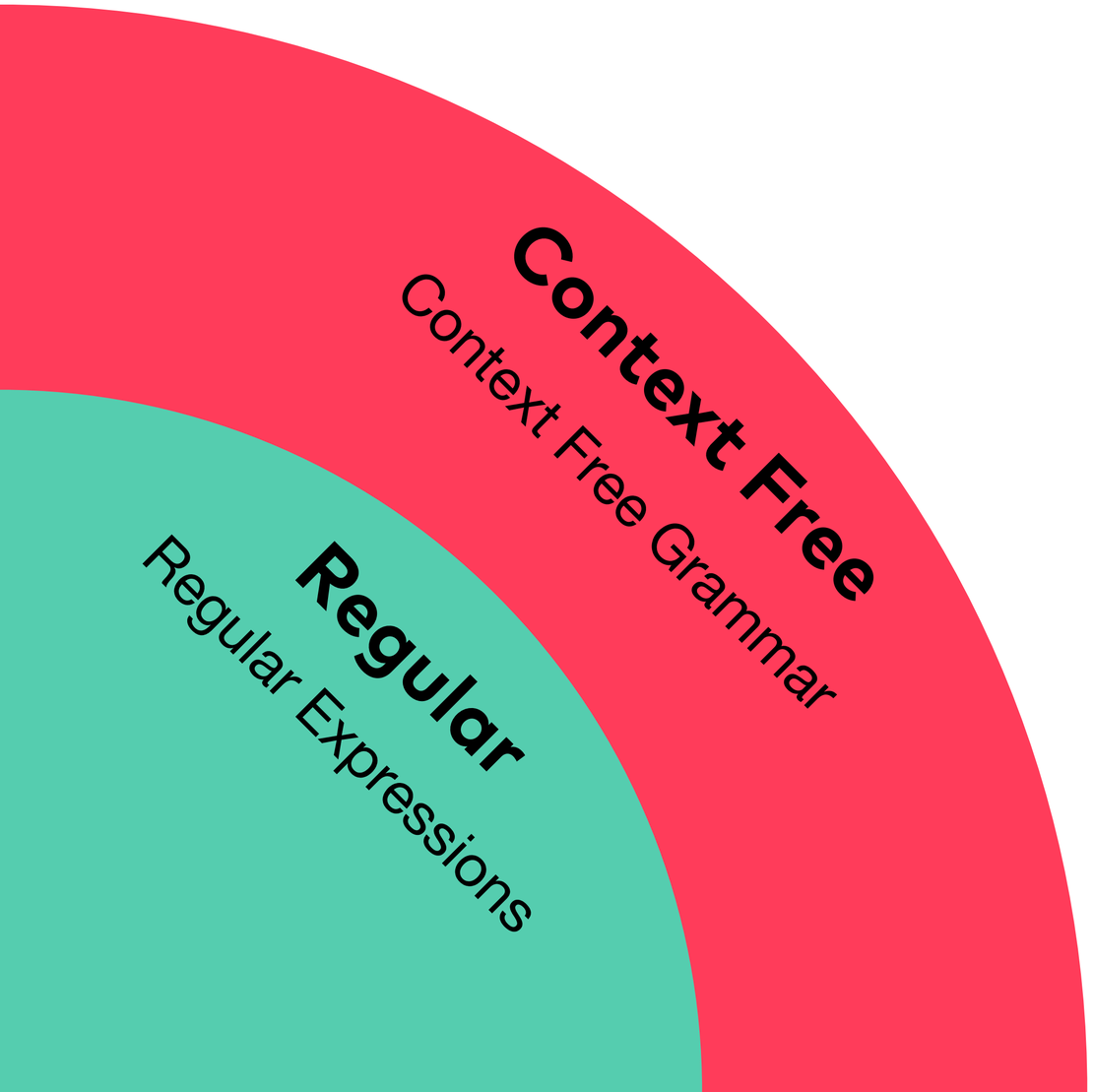
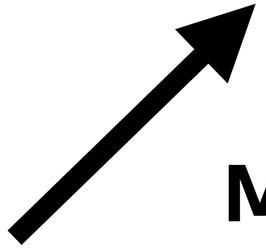
Chomsky hierarchy





More powerful,
less guarantees,
less performance

We have nodes now.
What's next?

Tree-Walk Interpreter

Every node has an eval method

```
Nodes = Struct.new(:nodes) do
  def eval(context)
    nodes.map { |node| node.eval(context) }.last
  end
end
```

What happens now?
Let's dive into the code

⌨️

https://try.halunke.jetzt

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