Metaprogramming with Macros

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Macros

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Textual abstraction:

- Recognize pieces of text that match a specification
- Replace them according to a procedure

Example

```
(let (x 42) (print x))
```

```
((lambda (x) (print x)) 42)
```

Example

```
(let (x 42) (print x))

(defmacro let args
  (cons
   (cons 'lambda
         (cons (list (caar args))
               (cdr args)))
   (cdar args)))

((lambda (x) (print x)) 42)
```

Why macros?

- Deeply embedded DSLs (database access, testing)
- Optimization (programmable inlining, fusion)
- Analysis (integrated proof-checker)
- Effects (effect containment and propagation)
- ...

Today's talk

Macrology is vast:

- Notation
- Variable capture
- Typechecking meta-programs
- Syntax extensibility
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Surveyed papers are versatile as well.

Today's talk

Going into all the details is a genuine pleasure

But instead let me tell you a story

Alexandre Dumas

Outline

The story of bindings