Macros

Announcements

Macros

Macros Perform Code Transformations

A macro is an operation performed on the source code of a program before evaluation
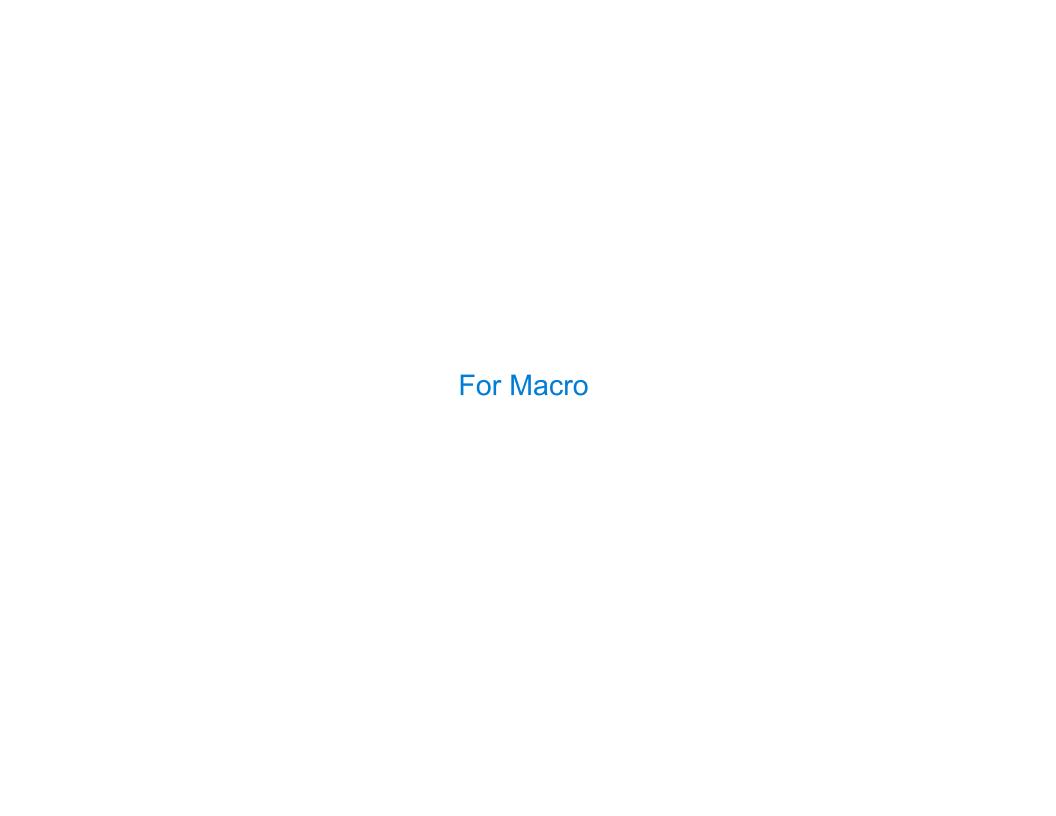
Macros exist in many languages, but are easiest to define correctly in a language like Lisp

Scheme has a **define-macro** special form that defines a source code transformation

```
(define-macro (twice expr)      > (twice (print 2))  ▶ (begin (print 2) (print 2))
  (list 'begin expr expr))        2
                                  2
```

Evaluation procedure of a macro call expression:

- Evaluate the operator sub-expression, which evaluates to a macro
- Call the macro procedure on the operand expressions *without evaluating them first*
- Evaluate the expression returned from the macro procedure

(Demo)

For Macro

Discussion Question

Define a macro that evaluates an expression for each value in a sequence

```
scm> (map (lambda (x) (* x x)) (2 3 4 5))
(4 9 16 25)
```

```
(define-macro (for sym vals expr)
  (list 'map _____(list 'lambda (list sym) expr) vals)_____)
```

```
scm> (for x (2 3 4 5) (* x x))
(4 9 16 25)
```

(Demo)

Implementing Macros

(Demo)