

Macros

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## Announcements

# Expressions

## Discussion Question: Pythagorean Theorem

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Quick quasiquotation review: ``(+ ,( * 2 3) 1)` evaluates to `(+ 6 1)`

Add ``` and `,` in some blanks so that the second expression evaluates to `(+ (* a a) (* b b))`

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_(define (square-expr term) _ ( _* _term _term))
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_( _+ _ ( _square-expr _a) _ ( _square-expr _b))
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(Demo)

Macros



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(Demo)

For Macro

## Discussion Question

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scm> (for x (2 3 4 5) (* x x))  
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scm> (map (lambda (x) (* x x)) (2 3 4 5))
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(define-macro (for sym vals expr)  
  (list 'map _____))
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(Demo)

Trace

## Tracing Recursive Calls

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```
def trace(fn):
    def traced(n):
        print(f'{fn.__name__}({n})')
        return fn(n)
    return traced
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```
@trace
def fact(n):
    if n == 0:
        return 1
    else:
        return n * fact(n - 1)
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(define original fact)
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  (print (list 'fact n))
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(Demo)