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(define (evalquote fn x)
  (apply fn x '()))

(define (apply fn x a)
  (cond ((atom fn) (cond ((eq? fn 'car) (caar x))
                          ((eq? fn 'cdr) (cdar x))
                          ((eq? fn 'cons) (cons (car x) (cadr x)))
                          ((eq? fn 'atom) (atom (car x)))
                          ((eq? fn 'eq) (eq? (car x) (cadr x)))
                          (else (apply (eval fn a) x a))))
        ((eq? (car fn) 'lambda) (eval (caddr fn) (pairlis (cadr fn) x a)))
        ((eq? (car fn) 'label) (apply (caddr fn) x
                                       (cons (cons (cadr fn) (caddr fn))
                                             a)))))

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(define (eval e a)
  (cond ((atom e) (cdr (assoc e a)))
        ((atom (car e)) (cond ((eq? (car e) 'quote) (cadr e))
                               ((eq? (car e) 'cond) (evcon (cdr e) a))
                               (else (apply (car e) (evlis (cdr e) a) a))))
        (else (apply (car e) (evlis (cdr e) a) a))))

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(define (evcon c a)
  (cond ((eval (caar c) a) (eval (cadar c) a))
        (else (evcon (cdr c) a))))

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(define (evlis m a)
  (cond ((eq? m nil) nil)
        (else (cons (eval (car m) a) (evlis (cdr m) a)))))

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(define (pairlis keys vals alist)
  (if (eq? keys nil)
      alist
      (cons (cons (car keys) (car vals))
            (pairlis (cdr keys) (cdr vals) alist))))

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(define (assoc x a)
  (cond ((eq? x (caar a)) (car a))
        (else (assoc x (cdr a)))))

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(evalquote '(lambda (x y) (cons (car x) y)) '((a b) (c d))) ; = '(a c d)

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