Clicker Qs for October 8
Suppose we write the continuation-passing style function (factorial-k n k). What will (factorial-k 5 (lambda (x) (* 2 x))) return? Note that 5-factorial is 120.

A. It will crash because the to-level continuation should be (lambda (x) x).
B. 120
C. 240 = 2* (5-factorial)
D. Whatever is the value of 10-factorial (2*5)-factorial
Answer C: $240 = 2 \times (5!)$
.
If we are writing \((\text{count-k a lat k})\) (which counts the number of times atom \(a\) appears in \(\text{lat}\) and then applies \(k\) to that value) we recurse in two different places. If \((\text{car lat})\) equals \(a\) we recurse \((\text{count-k a (cdr lat) k1})\). What is the new continuation \(k1\)?

A. \((\lambda (x) (k x))\)
B. \((\lambda (x) (k (+ x 1)))\)
C. \((\lambda (x) (+ (k x) 1))\)
D. \((\lambda (x) (k1 x))\)
Answer B: (lambda (x) (k (+ x 1)))
If we are writing \( (\text{count}^*-k \ a \ L \ k) \) that counts the number of instances of \( a \) in the general list \( L \), one case is that \( \text{car} \ L \) is itself a list instead of an atom, so we need to recurse into it: \( (\text{count}^*-k \ a \ \text{car} \ L \ k1) \). What is the new continuation \( k1 \)?

A. \( \lambda (x) \ (k \ (+ \ x \ 1)) \)
B. \( \lambda (x) \ (k \ (\text{count}^*-k \ a \ \text{cdr} \ L \ k)) \)
C. \( \lambda (x) \ (k \ (+ \ x \ (\text{count}^*-k \ a \ \text{cdr} \ L \ \lambda (t) \ t))) \)
D. \( \lambda (x) \ (\text{count}^*-k \ a \ \text{cdr} \ L \ \lambda (y) \ (k \ (+ \ x \ y))) \)
Answer D: (lambda (x) (count*-k a (cdr L) (lambda (y) (k (+ x y))))))