

In-Class Quiz 1**CS351—Fall 2008**

Thursday 6-Nov-2008

1. What do each of the following evaluate to? *Note: parenthesis are significant!*(a) `(cons '(a b) '(c d))`**Solution:** `((a b) c d)`(b) `(append '(a b) '(c d))`**Solution:** `(a b c d)`(c) `(list '(a b) '(c d))`**Solution:** `((a b) (c d))`(d) `(+ 1 ((if (pair? 'foo) * /) 10 2))`**Solution:** 6 (partial credit given for: 21)(e) `(map (lambda (x) (list 'a x)) '(aye bee sea))`**Solution:** `((a aye) (a bee) (a sea))`

2. Given the following definitions,

```
(define foo
  (lambda (x)
    (if (null? x)
        x
        (cons (car x)
              (bar (cdr x))))))
```

```
(define bar
  (lambda (x)
    (if (null? x)
        x
        (foo (cdr x)))))
```

(a) What does `(foo '(a b c d e f g))` evaluate to?**Solution:** `(a c e g)`(b) What does `(bar '(a b c d e f g))` evaluate to?

Solution: (b d f)

- (c) Define a function `baz` with the property that, given any list x with an even number of elements, $(\text{baz } (\text{foo } x) (\text{bar } x)) \Rightarrow x$.

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Solution:

```
(define baz
  (lambda (x y)
    (if (null? x)
        x
        (cons (car x)
              (baz y (cdr x))))))
```

Also acceptable:

```
(define baz
  (lambda (x y)
    (if (null? x)
        x
        (cons (car x)
              (cons (car y)
                    (baz (cdr x) (cdr y)))))))
```

Also acceptable:

```
(define baz
  (lambda (x y)
    (apply append (map list x y))))
```