

CSE 341 — General Programming Language Concepts — Mini Exercises

These are questions for discussion in class. (You don't need to hand in anything.) The solutions are on the class web page.

1. Consider the following example in Ruby.

```
def test k
  k = k+5
  print k
end

n = 0
test n
print n
```

- (a) What is the output in normal Ruby?
- (b) What would the output be if `k` were passed by reference?

2. Here is a Racket example.

```
(define a 3)

(define (test x)
  (printf "starting test - x = ~a\n" x)
  (set! a (+ a 1))
  (printf "after first set! - x = ~a\n" x)
  (set! a (+ a 1))
  (printf "leaving test - x = ~a\n" x))

(test (+ a 10))
```

- (a) What is the output in normal Racket?
- (b) What would the output be if `x` were passed by reference?
- (c) What would the output be if `x` were passed by name?
- (d) Rewrite the example to simulate call by name by passing a lambda.

3. True or false?

- (a) Haskell is statically typed if the programmer includes a type declaration for all functions; otherwise it is dynamically typed.
- (b) Java is type safe.
- (c) Each of the following Haskell expression gives a compile-time type error, since `tail` is being provided a value of the incorrect type:

```
tail []
tail (1,2,3)
```

4. What happens when you try the following Haskell program?

```
x :: Float
y :: Double
x = 3
y = 4
z = x+y
```