

COP4020 Spring 2011 Homework Assignment 7

1. Consider the following pseudo-code program:

```
sum : integer // a global variable
procedure add(amount : integer)
    sum := sum + amount
procedure p(x : integer, adder : procedure)
    integer sum
    sum := x
    adder(x) // invoke procedure that was passed as argument
    write_integer(sum)
begin // main program
    sum := 0
    p(1, add)
end
```

- a. Suppose dynamic scoping with shallow binding is used by the interpreter to execute this code. What is the value printed by the program?
 - b. Suppose dynamic scoping with deep binding is used by the interpreter to execute this code. What is the value printed?
 - c. Suppose static scoping is used. What is the value printed by the program?
2. What is the value printed by the following pseudo-code program for each of the four parameter passing modes *call-by-value*, *call-by-reference*, *call-by-value/result*, and *call-by-name*? That is, for each of the four parameter passing modes assume that both the x and y parameters use that mode. Show how each program is evaluated in that mode and show the final value printed:

```
a : integer // a global variable
procedure p(x : integer, y : integer)
    x := x + 1
    a := y
begin // main program
    a := 2
    p(a, a)
    write_integer(a)
end
```