

Tutorial 3: Problems

CSC 467 Compilers and Interpreters
Fall Semester, 2005

1. Problem 6.8, p.382
2. Problem 7.3, p.456
3. Suppose that procedure swap2 is declared as follows:

```

procedure swap2(x,y:integer);
  procedure f():integer;
    var z:integer;
  begin (* f *)
    z:=x; x:=y; return z
  end f;
begin (* swap2 *)
  y=f()
end swap2;

```

Describe the effect of the procedure call swap2(i, A[i]) under each of the following parameter-passing methods:

- a. Call-by-value
 - b. Call-by-reference
 - c. Copy restore
 - d. Call-by-name
4. Consider the following syntax-directed definition:

Production	Semantic Rule
$F \rightarrow D$	$F.w := 1$ $F.v := D.v$ $D.s := -1$
$F \rightarrow F_1 D$	$F.w := F_1.w + 1$ $F.v := F_1.v + D.v$ $D.s := -F_1.w - 1$
$D \rightarrow 0$	$D.v := 0$
$D \rightarrow 1$	$D.v := 2^{D.s}$

- (a) Which of the above attributes are inherited?
- (b) Which are synthesized?

- (c) Is the above syntax-directed definition L-attributed? Briefly explain.
- (d) Show the Translation Scheme for the above syntax-directed definition, which obeys the three restrictions that ensure that an attribute value is available when an action refers to it.
- (e) Transform the given syntax-directed definition so that all inherited attributes are defined by copy rules.