Homework of Chapter 6

- 6.7
- 6.8
- 6.13

- Deadline: 4.26
- The homework answers should be written in English.

Chapter 6 Semantic Analysis

- 6.7 Consider the following grammar for simple Pascal-style declarations:

  decl → var-list: type

  vsr-list → var-list, id | id

  type → integer

  type → real

  Write the attribute grammar for this grammar.

- 6.8 Consider the grammar of 6.7. Rewrite the grammar so that the type of a variable can be purely synthesized attribute, and give a new attribute grammar for the type has this property.

6.13 Consider the following attribute grammar:

Grammar Rule	Semantic Rule
S → A B C	B.u = S.u A.u = B.v + c.v S.v = A.v
A → a	A.v = 2 * A.u
B → b	B.v = B.u
C → c	C.v = 1

(a) Draw the parse tree for string abc, and draw the dependency graph for the associated attributes. Describe a correct order for the evaluation of the attributes.

(b) Suppose that S.u is assigned the value of 3 before attribute evaluation begins. What is the value of S.v when the evaluation has finished?

(c) Suppose the attribute equations are modified as follows:

Grammar Rule	Semantic Rule
$S \rightarrow A\ B\ C$	B.u = S.u C.u = A.v A.u = B.v + c.v S.v = A.v
$A \rightarrow a$	A.v = 2 * A.u
$B \rightarrow b$	B.v = B.u
$C \rightarrow c$	C.v = C.u - 2

What value does S.v have after attribute evaluation, if S.u=3 before evaluation begins?