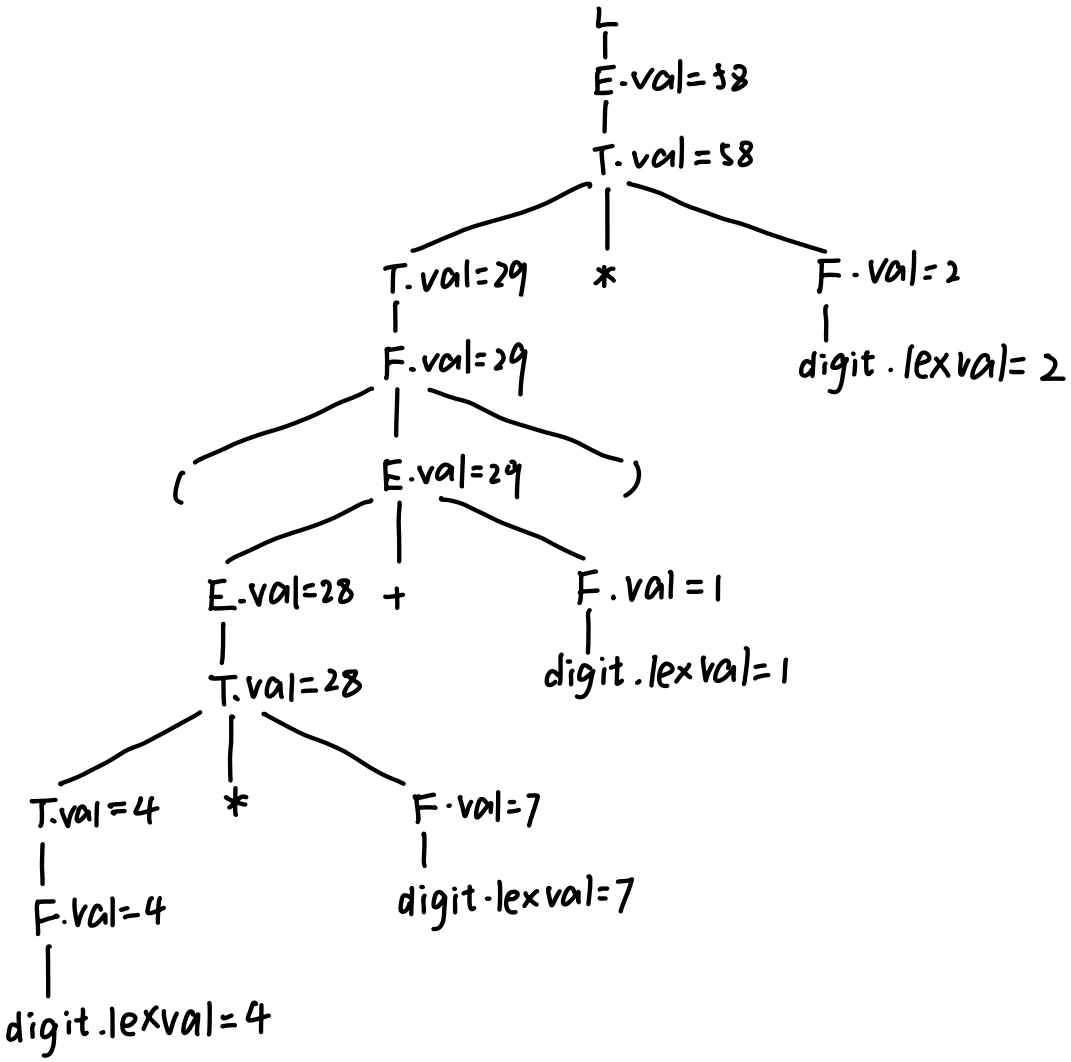
1. 按照表 6.1 所示的属性文法，构造表达式(4 * 7 + 1) * 2 的附注语法树。

表 6.1　一个简单台式计算器的属性文法

产 生 式	语 义 规 则
$L \rightarrow En$	print(E.val)
$E \rightarrow E_1 + T$	$E.val := E_1.val + T.val$
$E \rightarrow T$	E.val := T.val
$T \rightarrow T_1 * F$	$T.val := T_1.val * F.val$
$T \rightarrow F$	T.val := F.val
$F \rightarrow (E)$	F.val := E.val
F→digit	F.val := digit.lexval



1. 给出下面表达式的逆波兰表示(后缀式)：

a * (− b + c)　　not A or not (C or not D)

a + b * (c + d/e)　　(A and B) or (not C or D)

① a'(-b+c)'*

a ((-b)'c'+)*

a (b- c+)*

a b-c +*

② (not A)' [not (C or not D)]' or

A not [(C or not D)' not]or

A not [C (not D)' or not]or

A not C D not or not or

③ a[b* (c+ d/e)]'+

a [b (c+ d/e)'*]+

a [b [c (d/e)'+)*] +

a[b [c (de/)+) *]+

abc de/+ * +

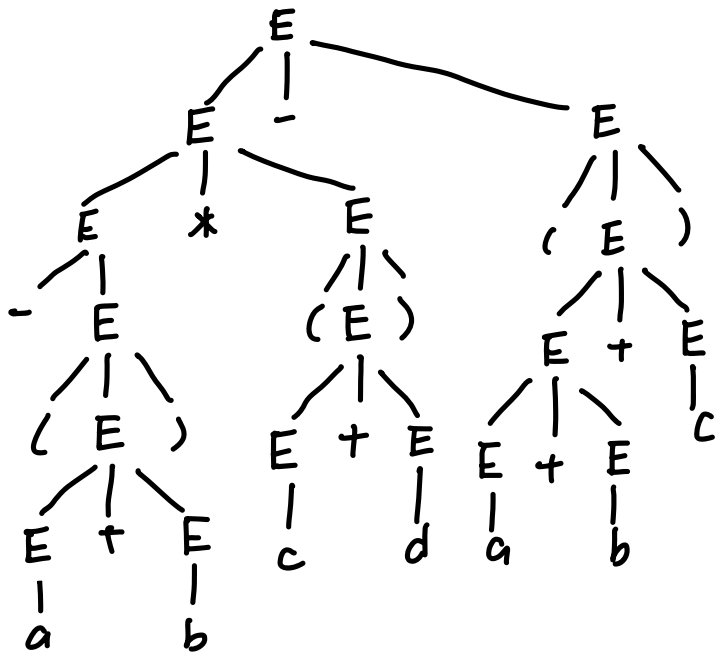
④ (A and B)' (not C or D)' or

(A B and) ((not C)' D or) or

(A B and) (C not D or) or

AB and C not D or or

3. 请将表达式 - (a + b) * (c + d) - (a + b + c)分别表示成三元式、间按三元式和四元式序列。



$T_1 = a + b$

$T_2 = -T_1$

$T_3 = c + d$

$T_4 = T_2 * T_3$

$T_5 = a + b$

$T_6 = T_5 + c$

$T_7 = T_4 - T_6$

四元式

	op	arg1	arg2	result
(0)	+	a	b	T_1
(1)	uminus	T_1		T_2
(2)	+	c	d	T_3
(3)	*	T_2	T_3	T_4
(4)	+	a	b	T_5
(5)	+	T_5	c	T_6
(6)	-	T_4	T_6	T_7

三元式

	op	arg1	arg2
(0)	+	a	b
(1)	uminus	(0)	
(2)	+	c	d
(3)	*	(1)	(2)
(4)	+	a	b
(5)	+	(4)	c
(6)	-	(3)	(5)

间接三元式：

三元式表

	op	arg1	arg2
(1)	+	a	b
(2)	uminus	(0)	
(3)	+	c	d
(4)	*	(1)	(2)
(5)	+	(3)	c
(6)	-	(2)	(4)

间接代码：

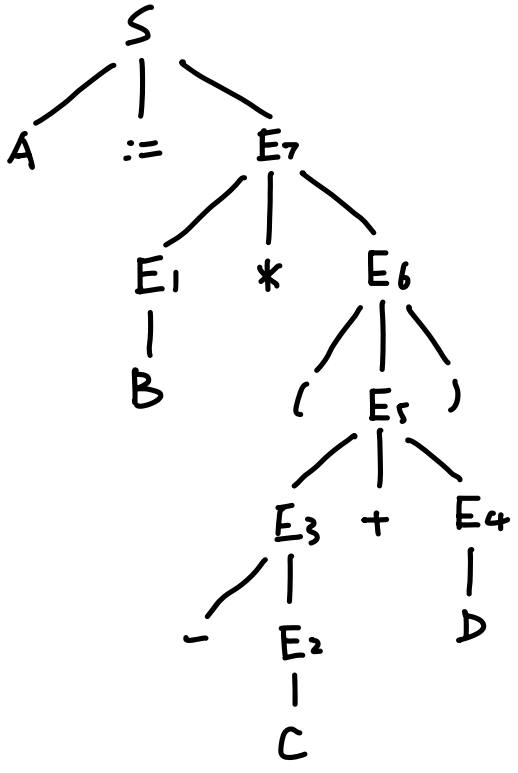
(1)
(2)
(3)
(4)
(1)
(5)
(6)

4. 按 7.3 节所说的办法，写出下面赋值句

$$A := B * (- C + D)$$

的自下而上语法制导翻译过程。给出所产生的三地址代码。

语法树：



$E_1.place = B$　$E_1.code =$ 空

$E_2.place = C$　$E_2.code =$ 空

$E_3.place = T_1$　$E_3.code = T_1 := -C$

$E_4.place = D$　$E_4.code =$ 空

$E_5.place = T_2$　$E_5.code = T_1 := -C$
$T_2 := T_1 + D$

$E_6.place = T_2$　$E_6.code = T_1 := -C$
$T_2 := T_1 + D$

$E_7.place = T_3$　$E_7.code = T_1 := -C$
$T_2 := T_1 + D$
$T_3 := B * T_2$

$S.code = T_1 := -C$
$T_2 := T_1 + D$
$T_3 := B * T_2$
$A := T_3$