Compiler Design - P2

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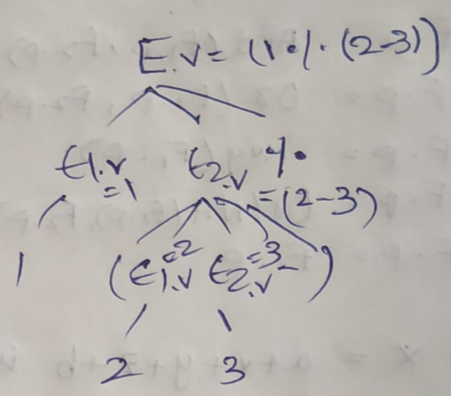
① $E \to E_1 E_2 -$ $\{E.V = (E_1.val) \circ (-.text) \circ (E_2.val)\}$

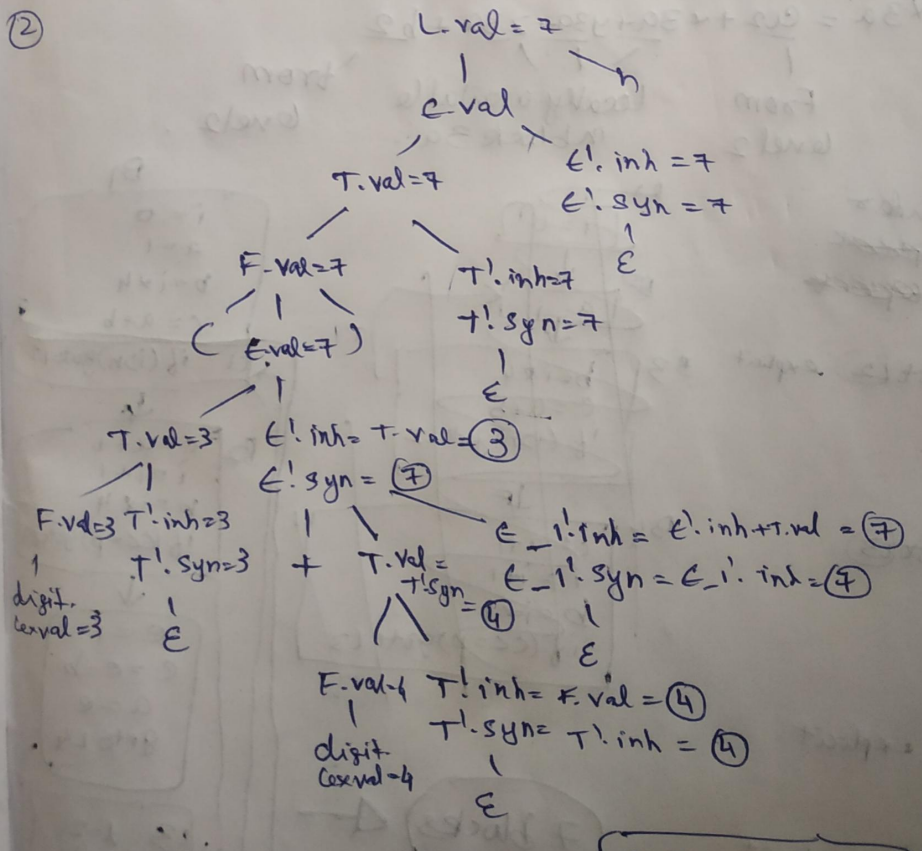
$E \to E_1 E_2 /$ $\{E.V = (E_1.val) \circ (/.text) \circ (E_2.val)\}$

$E \to 0$ $E.V = "0"$
$E \to 1$ $E.V = "1"$
$E \to 2$ $E.V = "2"$
$E \to 3$ $E.V = "3"$
$E \to 4$ $E.V = "4"$
$E \to 5$ $E.V = "5"$
$E \to 6$ $E.V = "6"$
$E \to 7$ $E.V = "7"$
$E \to 8$ $E.V = "8"$
$E \to 9$ $E.V = "9"$

(1 ∘ / ∘ (2 - 3))



②



3, 7, 4, 4, 4, 7, 7

(3)

$G \to F$	$G.p = F.p$
$F \to F_1 \wedge F_2$	$F.p = \langle\langle 1 \rangle\rangle$
$F \to F_1 \vee F_2$	$F.p = \langle\langle 2 \rangle\rangle$
$F \to \neg F_1$	$F.p = \langle\langle 3 \rangle\rangle$
$F \to F_1 \Rightarrow F_2$	$F.p = \langle\langle 4 \rangle\rangle$
$F \to (F_1)$	$F.p = \langle\langle 5 \rangle\rangle$
$F \to id$	$F.p = id.lexeme$

$F.p = And(F_1.p, F_2.p)$
$F.p = Or(F_1.p, F_2.p)$
$F.p = Neg(F_1.p)$
$F.p = Or(Not(F_1.p), F_2.p)$
$F.p = F_1.p$

Since parent value is got from child, it is Synthesized.

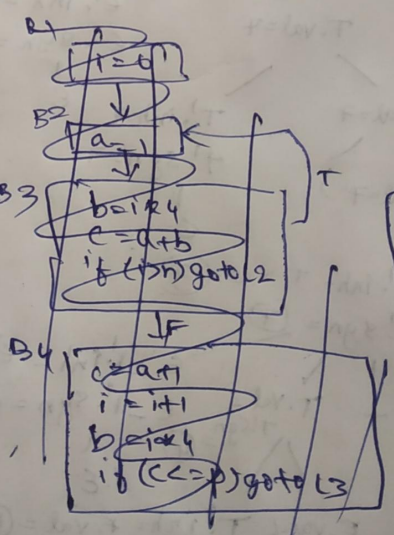
(4) $x = a+x+y+z+b$ is in procedure C.

Since it is in level 3a:

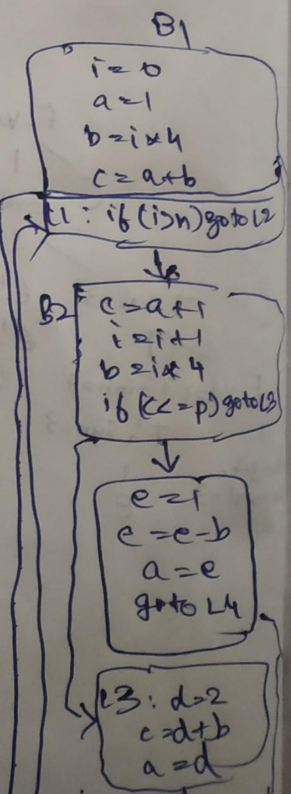
$x_{3a} = a_{2} + x_{3a} + y_{3a} + z_{3a} + b_{2}$

- a_2, b_2: From level 2
- x_{3a}, y_{3a}, z_{3a}: Locally available in block 3a.
- From level 2.

(5)
1) i = 0 - leader
2) a = 1
3) b = i*4
4) c = a+b
5) L1: if (i>n) goto L2 explicit
6) c = a+1
7) i = i+1
8) b = i*4
9) if (c<=p) goto L3
10) e = 1
11) c = e-b
12) a = e
13) goto L4
14) L3: d = 2 explicit
15) c = d+b
16) a = d
17) L4: goto L1 explicit
18) L2: explicit



7 blocks



(6) Dag a-diagram.

```
t1 = 8 * i
t2 = a(t1)
t3 = 8 * i
t4 = b(t3)
t5 = t2 + t4
t6 = p + t5
p = t6
t7 = i + 1
i = t7
if i <= N goto (2)
```

(7)