

Ash 2

1a) Static Scoping

- 1 static scoping refers to top level environment. First case $x=1$ so output will be b till overwritten
- 2 using `set_x()` then $x=2$

b) Dynamic Scoping

- 1 dynamic refers to low level environment and the program will print $x=1$ for the last statement due to the new declaration
- 2 variable within `second()` does not hold outside of `second()`

2a) The difference is lines 7,8 where B and P are changed.

b) Prog 1

output = 3

bii) Prog 2

output = 1

c) Prog 1

- Line 14 Function A is called passing (1, c)
- Line 1 $I=1, P=c$ in Function A
- Line 12 c is passed
- control jumps to else in Line 10 calls A passing $I=2$
- Line 8 enters if calling A with $I=3$
- Line 6 loop enters A with $I=4$
- Line 4 has no function call for A

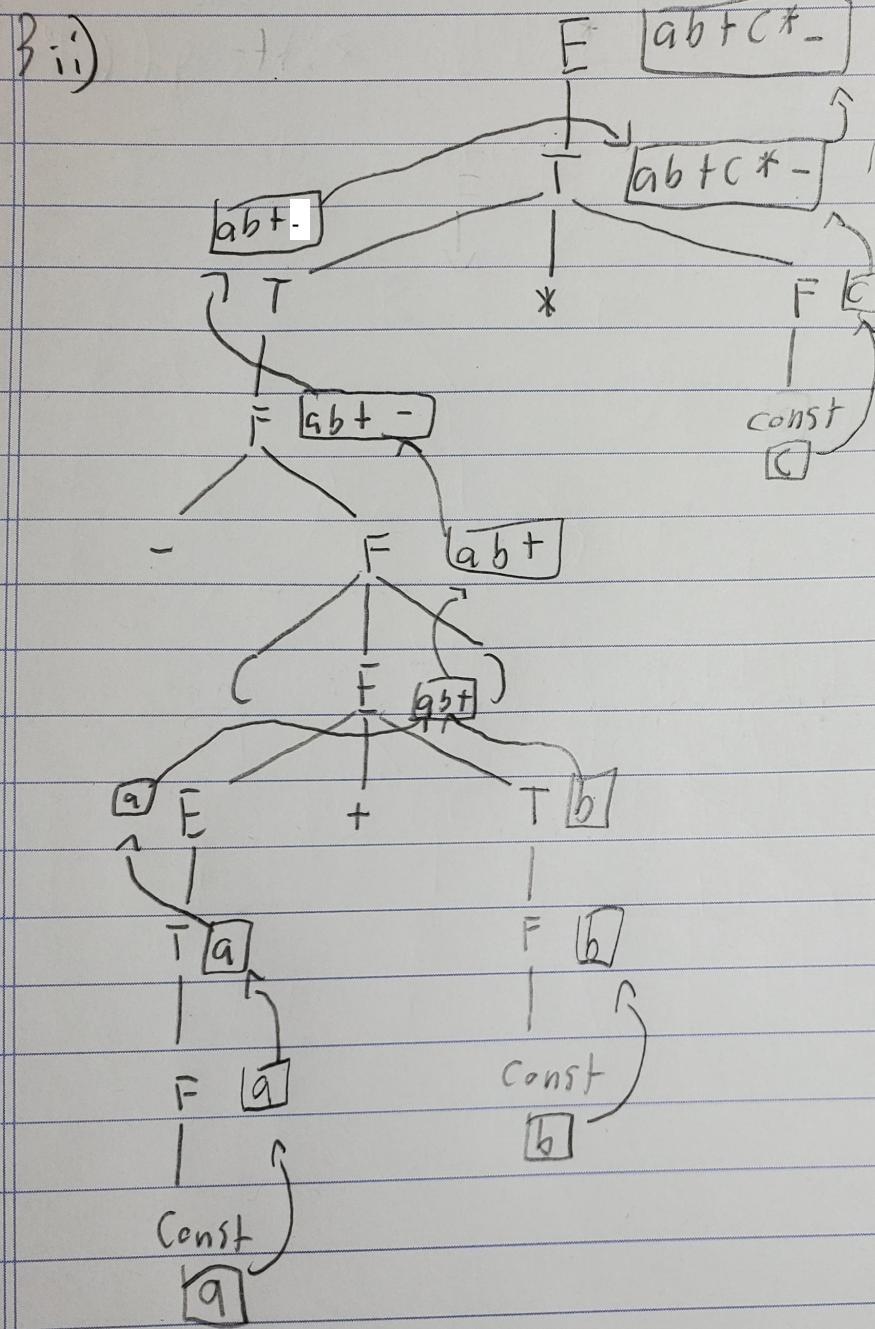


- function which contains prints
is B
- Prints $I=3$ because line 6
where B is called $I=3$

Prog 2

- Same execution but only line 10
calls printing function where $I=1$
- Therefore prints 1 instead -F3
- In line 6 and 8: the else if
and if is calling function
 P instead of B which does not
print

1. $:) I \cdot E_1 \rightarrow E_2 + T \quad (E_1^{\text{post}} := E_2, \text{post}, T, \text{post}, " + ",)$
2. $E_1 \rightarrow E_2 - T \quad (E_1^{\text{post}} := E_2, \text{post}, T, \text{post}, " - ",)$
3. $E \rightarrow T \quad (E^{\text{post}} := T, \text{post})$
4. $T_1 \rightarrow T_2 * F \quad (T_1^{\text{post}} := T_2, \text{post}, T, \text{post}, " * ",)$
5. $T_1 \rightarrow T_2 / F \quad (T_1^{\text{post}} := T_2, \text{post}, F, \text{post}, " / ",)$
6. $T \rightarrow F \quad (T^{\text{post}} := F, \text{post})$
7. $F_1 \rightarrow -F_2 \quad (F_1^{\text{post}} := F_2, \text{post}, " - ",)$
8. $F \rightarrow (E) \quad (F^{\text{post}} := (E, \text{post}))$
9. $F \rightarrow \text{const} \quad (F^{\text{post}} := \text{const})$



X

4. $I, E \rightarrow TTT$

$$\Delta TT_{\text{post}} := T_{\text{post}} \quad \Delta E_{\text{post}} := TT_{\text{post}}$$

5. $TT_1 \rightarrow +TT_2$

$$\Delta TT_2 \text{.st} := TT_1 \text{.st}, T_{\text{post}}, "+" \quad \Delta TT_1 \text{.post} := TT_2 \text{.post}$$

3. $TF_1 \rightarrow -T TT_2$

$$\Delta TT_2 \text{.st} := TT_1 \text{.st}, T_{\text{post}}, "-" \quad \Delta TT_1 \text{.val} := TT_2 \text{.post}$$

4. $TT \rightarrow E$

$$\Delta TT_{\text{post}} := TT_{\text{st}}$$

5. $T \rightarrow F FT$

$$\Delta FT_{\text{st}} := F_{\text{post}} \quad \Delta t_{\text{post}} := FT_{\text{post}}$$

6. $FT_1 \rightarrow *FT_2$

$$\Delta FT_2 \text{.st} := FT_1 \text{.st}, F_{\text{post}}, * \quad \Delta FT_1 \text{.post} := FT_2 \text{.post}$$

7. $FT_1 \rightarrow /FT_2$

$$\Delta FT_2 \text{.st} := FT_1 \text{.st}, F_{\text{post}}, / \quad \Delta FT_1 \text{.post} := FT_2 \text{.post}$$

8. $FT \rightarrow E$

$$\Delta PT_{\text{post}} := FT_{\text{st}}$$

9. $F_1 \rightarrow -F_2$

$$\Delta F_1 \text{.post} := -F_2 \text{.post}, -$$

10. $F \rightarrow (E)$

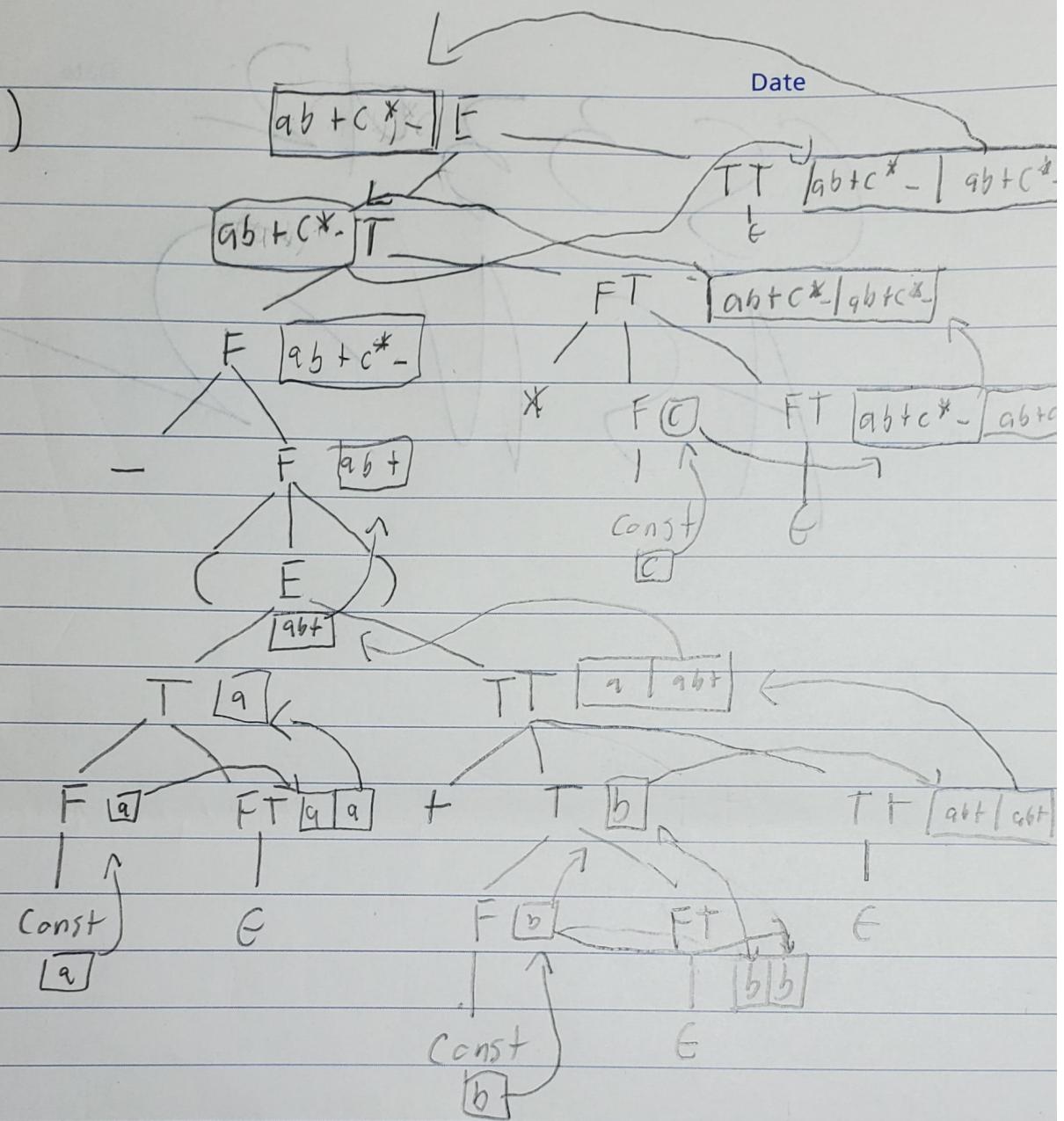
$$\Delta F_{\text{post}} = E_{\text{post}}$$

11. $F \rightarrow \text{const}$

$$\Delta F_{\text{post}} := \text{const. post}$$

Date

$$\psi_{1,ii})$$





5. infix: $x = y = (a >= b) ? f(a) : g(a+b)$

a) Prefix: $= ? + a y ; a F b \Rightarrow a y x$

b) Postfix: $- x y a >= b f a ; g a + ? =$