

# CS & IT Engineering

## Compiler Design

Syntax Directed Translations

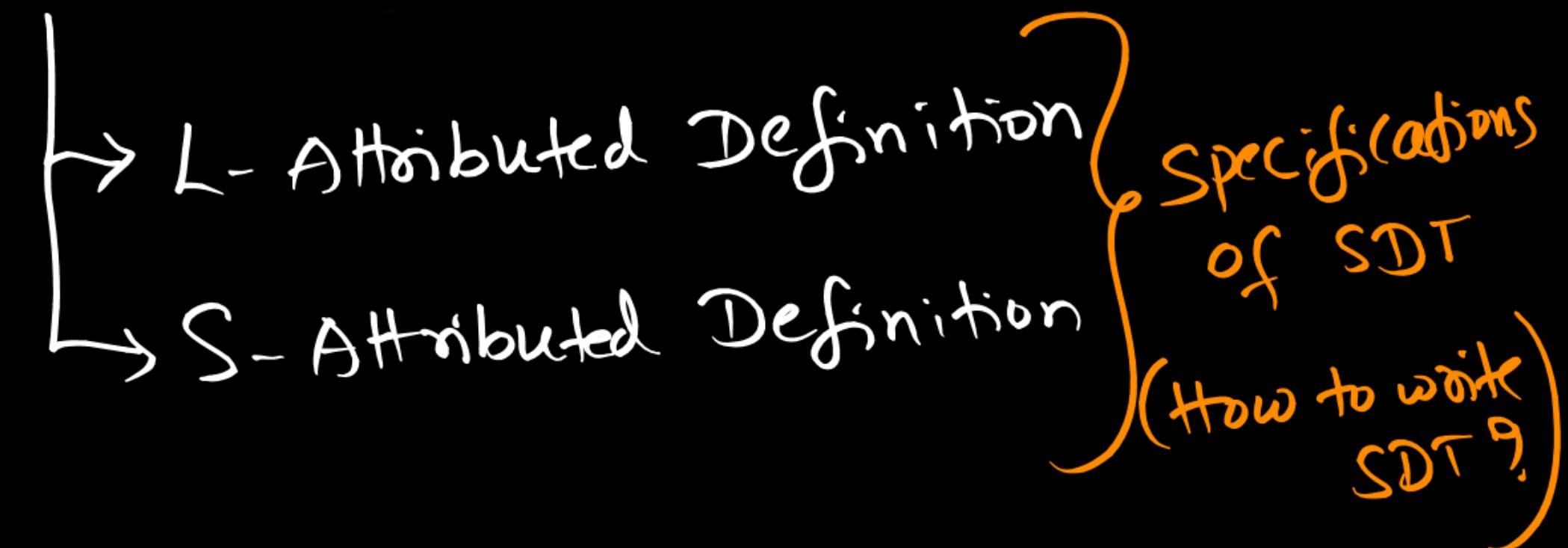
Lecture : 2



Deva sir

## Topics to be covered:

↳ SDT Definitions



L-attributed SDT

- I) Computation depends on Parent/left sibling/children
- II) Translation can placed anywhere in production
- III) Evaluation depends on
  - Translations order  
from left to Right

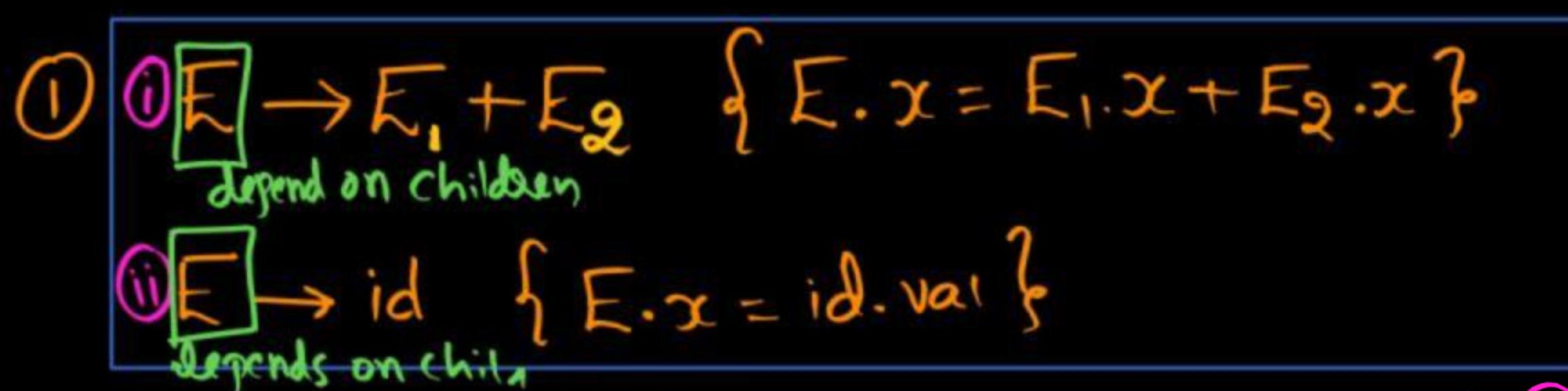
S-attributed SDT

- I) Computation depends on only children
- II) Translation Should be at the end of production
- III) Evaluation depends on
  - bottom up parsing  
(Reverse of RMD)  $\Rightarrow$  Nonterminal order

Note :

- I) Every S-attributed grammar is L-attributed.
- II) L-attributed SDT may or may not be S-attributed.

# Identify the type of attribute.



- A) L-attributed  
 B) S-attributed  
 C) Both A and B  
 D) None

- Q1) In Rule i), x is synthesized attribute  
 Q2) In Rule ii), x is synthesized attribute  
 Q3) In SDT, x is synthesized attribute

- A) L-attributed only  
 B) S-attributed only  
 C) Both S-attributed and L-attributed  
 D) None

Synthesised Attribute



Look at attribute

S-Attributed SDT



②

Depends on left sibling

 $S \rightarrow D [L]; \{ L.type = D.type \}$ 
 $D \rightarrow int \{ D.type = int \}$ 

Depends on child

 $L \rightarrow [L_1], id \{ L_1.type = L.type \}$ 

Depends on parent

 $L \rightarrow id \{ \}$ 

L-attributed SDT but

not S-attributed

what is definition of SDT?

- A) L-attributed
- B) S-attributed
- C) Both A & B
- D) None

3)

$$S \rightarrow S_1 S_2 \quad \{ S.\text{count} = S_1.\text{count} + S_2.\text{count} \}$$

$$S \rightarrow (S_1) \quad \{ S.\text{count} = S_1.\text{Count} + 1 \}$$

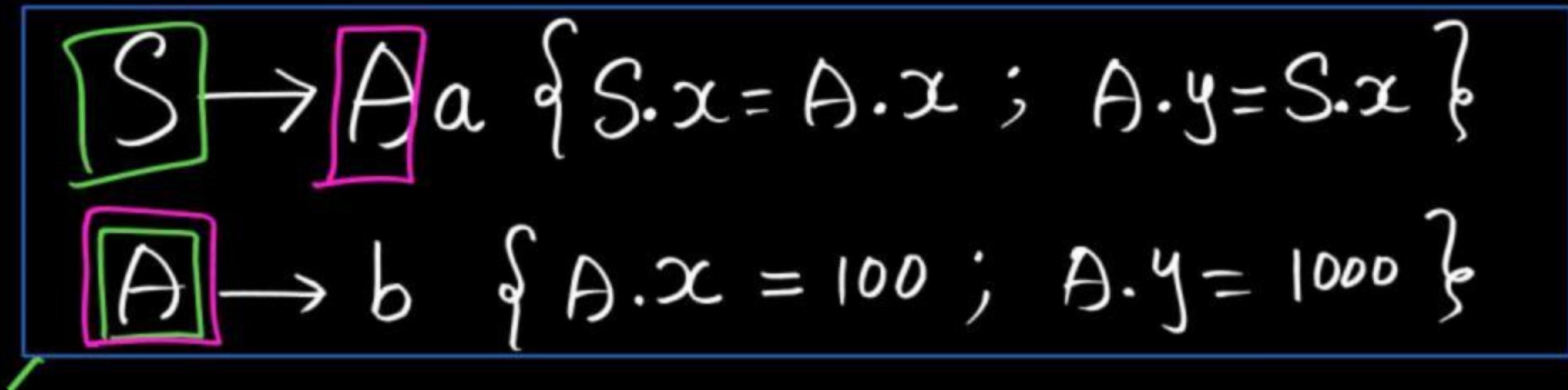
$$S \rightarrow \epsilon \quad \{ \}$$

Above SDT is Bulk S-attributed grammar  
 and L-attributed grammar

M(Q):

- A) L-attributed
- ~~B) S-attributed~~
- C) L-attributed but not S-attributed
- D) None

4)



SDT is Not S-attributed

SDT is L-attributed

⑤

$$E \rightarrow T + F \quad \{ E.x = T.y ; F.y = E.x + 2 ; E.y = F.y - 1 \}$$

$$T \rightarrow id \quad \{ T.x = 10 ; T.y = id.val \}$$

$$F \rightarrow id \quad \{ F.x = id.val ; F.y = 20 \}$$

Above SDT is

- A) L-attributed
- B) L-attributed only
- C) L-attributed but not S-attributed
- D) None

⑥

$$S \rightarrow [S_1] S_2 \quad \left\{ S_1.x = S_2.x + S.x \right\}$$

depends on Parent and Right sibling

$$S \rightarrow a \quad \left\{ S.x = a.value \right\}$$

P  
W

Above SDT is ——

- A) L-attributed only
- B) S-attributed only
- C) Both L-attributed and S-attributed
- D) None [Neither S-attributed nor L-attributed]

⑦

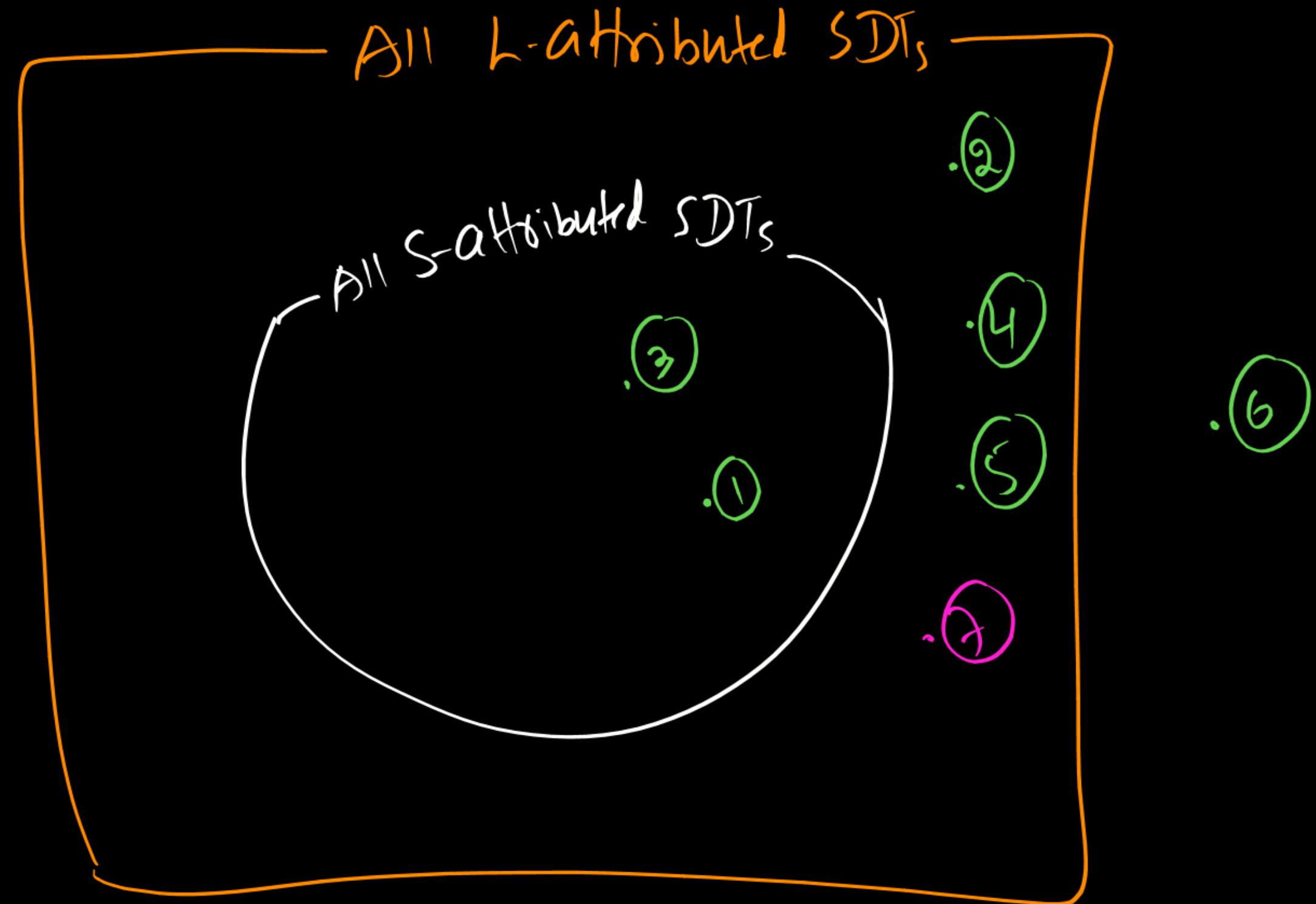
$$S \rightarrow \{ S.x = a.\text{val} \} a$$

$$S \rightarrow b \{ S.x = b.\text{val} \}$$

Above SDT is L-attributed but not S-attributed

$$S \xrightarrow{f} a$$

$$S \xrightarrow{f} b$$



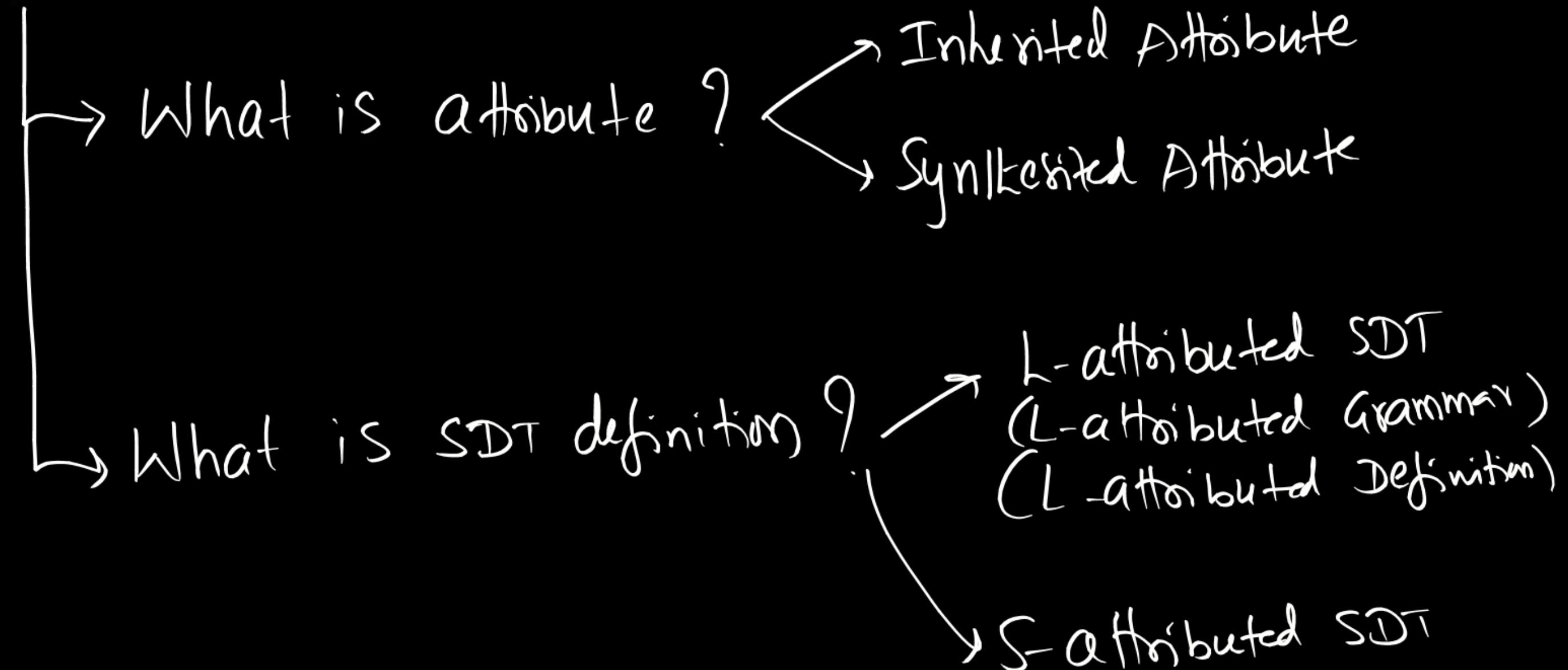
{ . . . . }

Translation

S → { . . . } a

S → ad{ . . . }

# Summary



Thank you  
PW  
Soldiers

