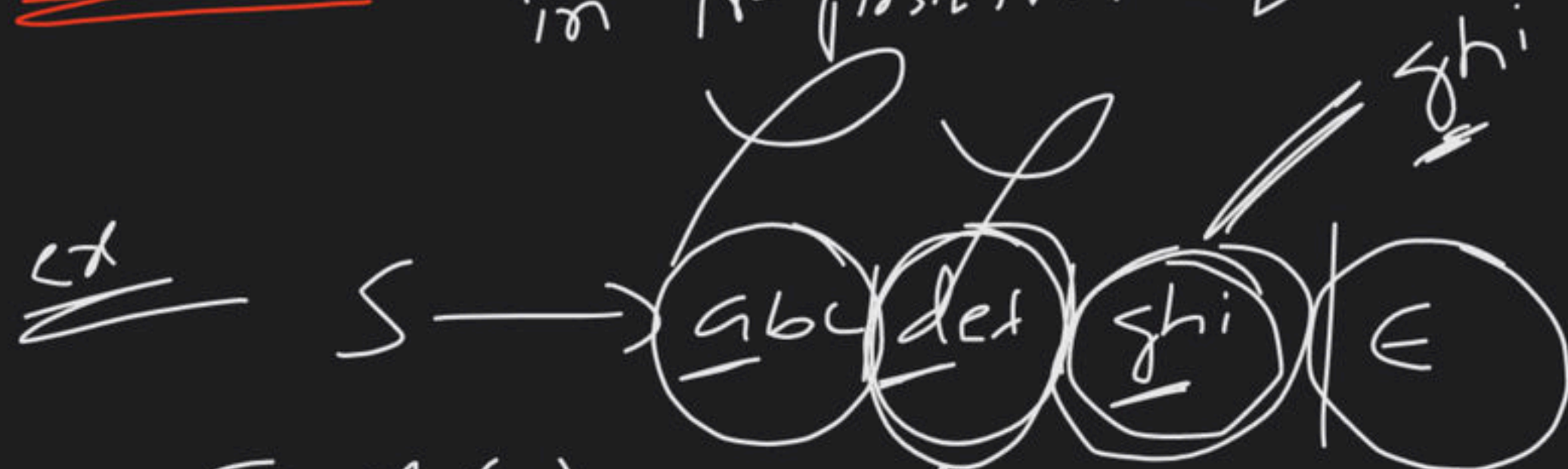


Parsing-IV

Complete Course on Compiler Design

LL(1) - PT

First(S) = Set of all terminals present in 1st position of every string derived by S



$$\text{First}(S) = \text{a, d, g, e}$$

$$= \text{Fi}(\text{abc}), \text{Fi}(\text{de}), \text{Fi}(\text{ghi}), \text{Fi}(\epsilon)$$

$$= \text{Fi}(\text{a}), \text{Fi}(\text{d}), \text{Fi}(\text{g}), \text{Fi}(\epsilon)$$

$$= \text{a, d, g, e}$$

ex $S \rightarrow \text{as/a}$

$$\text{Fi}(S) = \text{Fi}(\text{as}), \text{Fi}(\text{a})$$

$$= \text{Fi}(\text{a}), \text{Fi}(\text{a})$$

$$= \text{a, a}$$

$$= \text{a}$$

$$\text{Fi}(\text{Tom}) = \text{Tom}$$

$$\text{Fi}(\epsilon) = \epsilon$$

ex

S \rightarrow ABC / DEF / GHI

A \rightarrow a / j / k

B \rightarrow b

C \rightarrow c

D \rightarrow d G \rightarrow g

E \rightarrow e

H \rightarrow h

F \rightarrow f

I \rightarrow i

$Fi(S) = Fi(\underline{ABC}), Fi(\underline{DEF}), Fi(\underline{GHI})$

$Fi(A)$

\Downarrow

a, j, k

$Fi(D)$

\Downarrow

$Fi(d)$

$Fi(G)$

\Downarrow

$Fi(g)$

$Fi(BC)$

\Downarrow
 $Fi(B)$

b, j, h, i, k

$Fi(C)$

\Downarrow
a, k, j, c

ex

S \rightarrow ABCd

A \rightarrow a / d / c / f / ~~e~~

B \rightarrow b / g / h / i / ~~e~~

C \rightarrow c / j / k / ~~e~~

$Fi(S) = Fi(ABCd)$

$= Fi(A)$

$= a, d, e, f$ ~~Fi(BCd)~~

$\in BC$

BC

ex

$$E \rightarrow TE'$$

$$E' \rightarrow +TE' \mid \epsilon$$

$$T \rightarrow FT'$$

$$T' \rightarrow \emptyset FT' \mid \epsilon$$

$$F \rightarrow (E) \mid id$$

	$Fi()$
E	$<, id$
E'	$+, \epsilon$
T	$<, id$
T'	\emptyset, ϵ
F	$<, id$

$$Fi(T) \Rightarrow Fi(FT') \Rightarrow Fi(F) \Rightarrow <, id$$

$S \rightarrow aBDh$

$B \rightarrow c \mid \epsilon$

$C \rightarrow \textcircled{bc} \textcircled{\epsilon}$

$D \rightarrow EF$

$E \rightarrow f \mid \epsilon$

$F \rightarrow e \mid \epsilon$

	$F_i()$
S	a
B	c, ϵ
C	b, ϵ
D	f, e, ϵ
E	f, ϵ
F	e, ϵ

$F_i(D)$

\Downarrow

$F_i(EF)$

\Downarrow

$F_i(E)$

\Downarrow

$F_i(f)$

\Downarrow

$F_i(\epsilon) = e, \epsilon$

no. of val. F_i is 255

$m=4$

$m=5$

$x_{turn} = 2x$

Follow()

ex

$S \rightarrow ABCd$

$A \rightarrow DEF$

$B \rightarrow b$

$d \rightarrow c$

$D \rightarrow d$

$E \rightarrow c$

$c \rightarrow \epsilon$



$$Fi(D) = d$$

$$\begin{aligned} Fo(D) &= Fi(EF) \\ &= Fi(E) \\ &= c \end{aligned}$$

$$\begin{aligned} Fo(A) &= Fi(BCd) \\ &= Fi(B) \\ &= b \end{aligned}$$

$$\begin{aligned} Fo(F) &= Fo(A) \\ &\Downarrow Fi(BCd) \\ &\Downarrow Fi(B) \\ &\Downarrow Fi(c) \\ &\Downarrow \epsilon \end{aligned}$$

$$Fo(B) = Fi(c) \Downarrow c$$

$$\begin{aligned} Fo(\epsilon) &\Downarrow \\ &Fo(S) \\ &\Downarrow \\ &Fi(\$) \\ &\Downarrow \\ &\$ \end{aligned}$$

ed

$S \rightarrow ABC$

$A \rightarrow DEF$

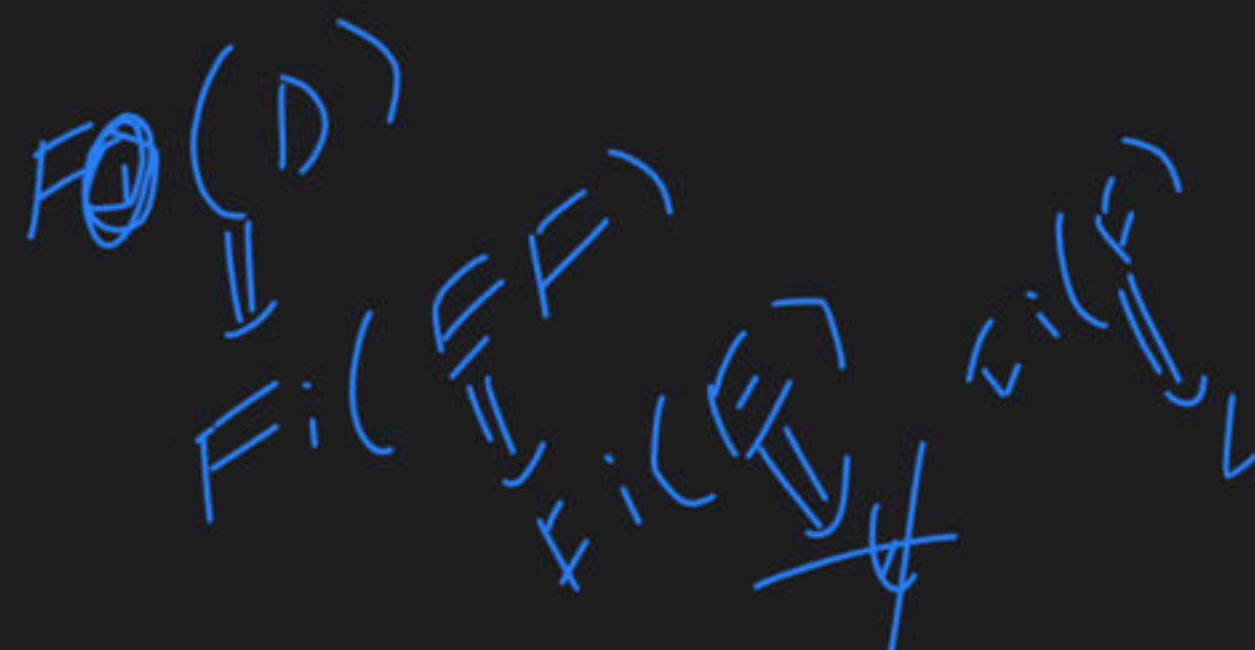
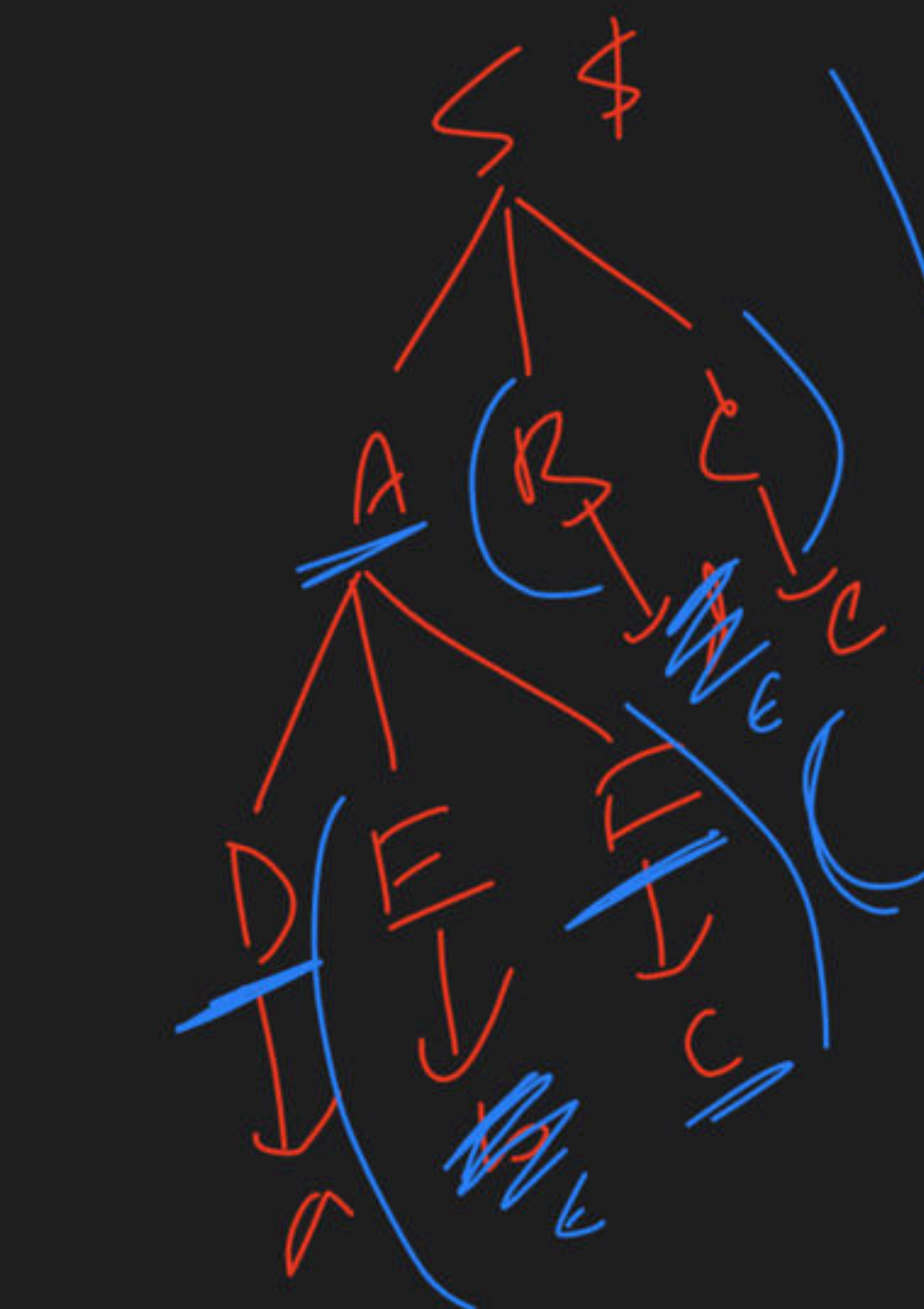
$D \rightarrow a$

$E \rightarrow b$

$F \rightarrow c$

$B \rightarrow a$

$C \rightarrow e$



$FO(E) = FO(A)$

$Fi(B)$

$Fi(B)$

$Fi(C)$

e

$S \rightarrow ABC$

$A \rightarrow DEF$

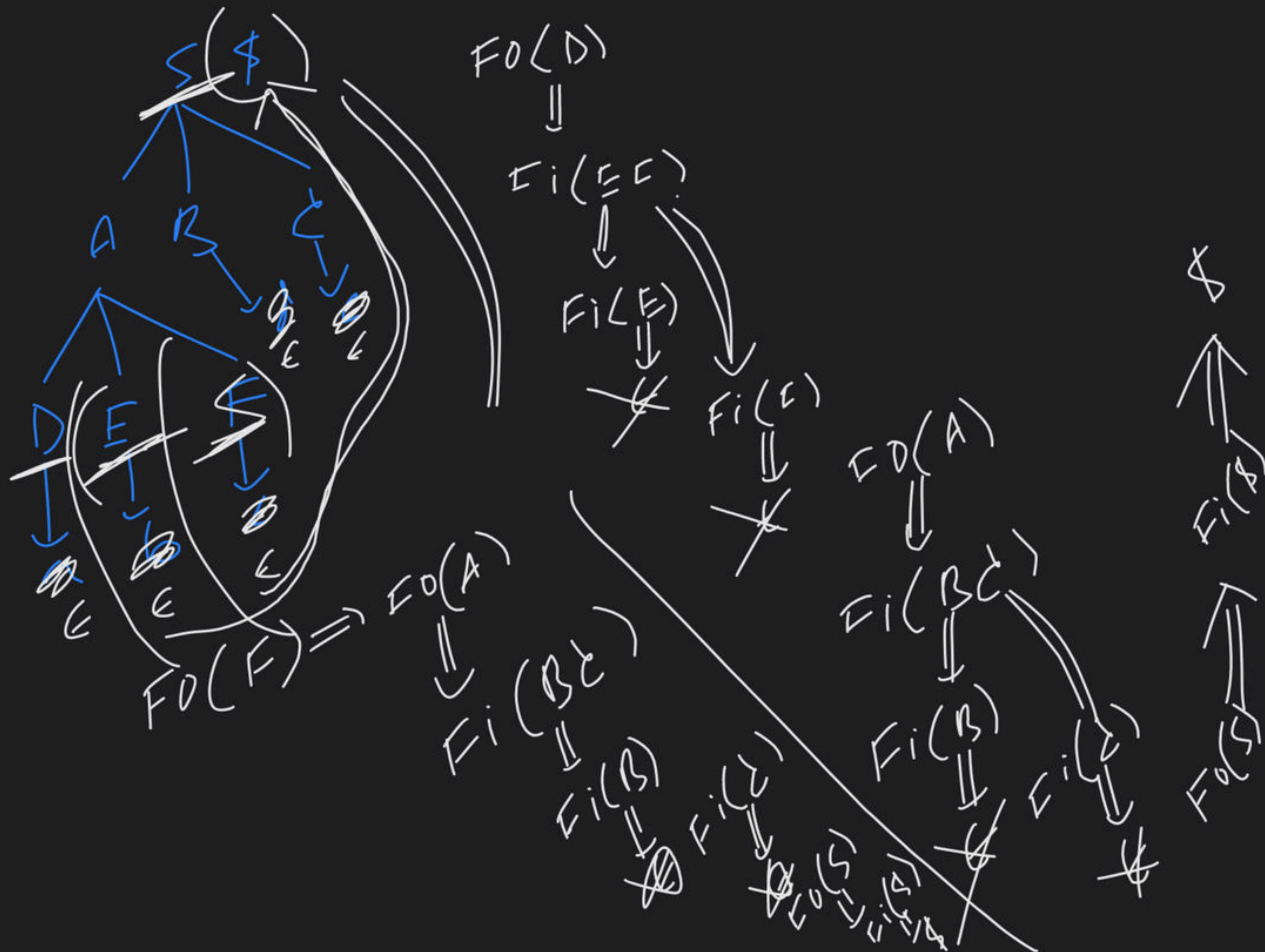
$D \rightarrow \cancel{E}$

$E \rightarrow \cancel{E}$

$F \rightarrow \cancel{E}$

$B \rightarrow \cancel{E}$

$C \rightarrow \cancel{E}$



rules to find follow()

Assume A is variable

① If A is start symbol
 $\text{Follow}(A) = \$ \left[\text{minimum} \right]$

② $B \rightarrow C D \underline{A} (E F)$
 $\text{Follow}(A) = \text{Fi}(EF)$

③ $B \rightarrow C D \underline{A}$
 (ϵ)

$B \rightarrow C D \underline{A} \epsilon$

$E \rightarrow \epsilon$

$\text{Follow}(A) = \text{Follow}(B)$