CHI : Analyse Syntaxique

But : Analyser Syntaxiquement un texte (un code ...)

Comment : Construire un analyseur syntaxique **prédictif**

↓

à l'aveugle : si ... alors ...

si j'ai ce symbole alors j'applique cette règle

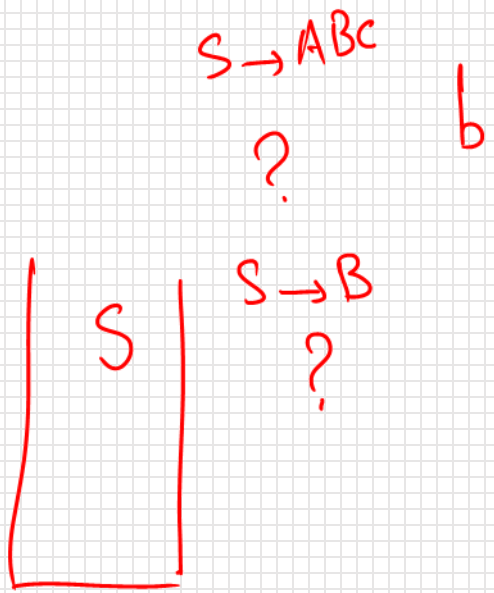
prédicats

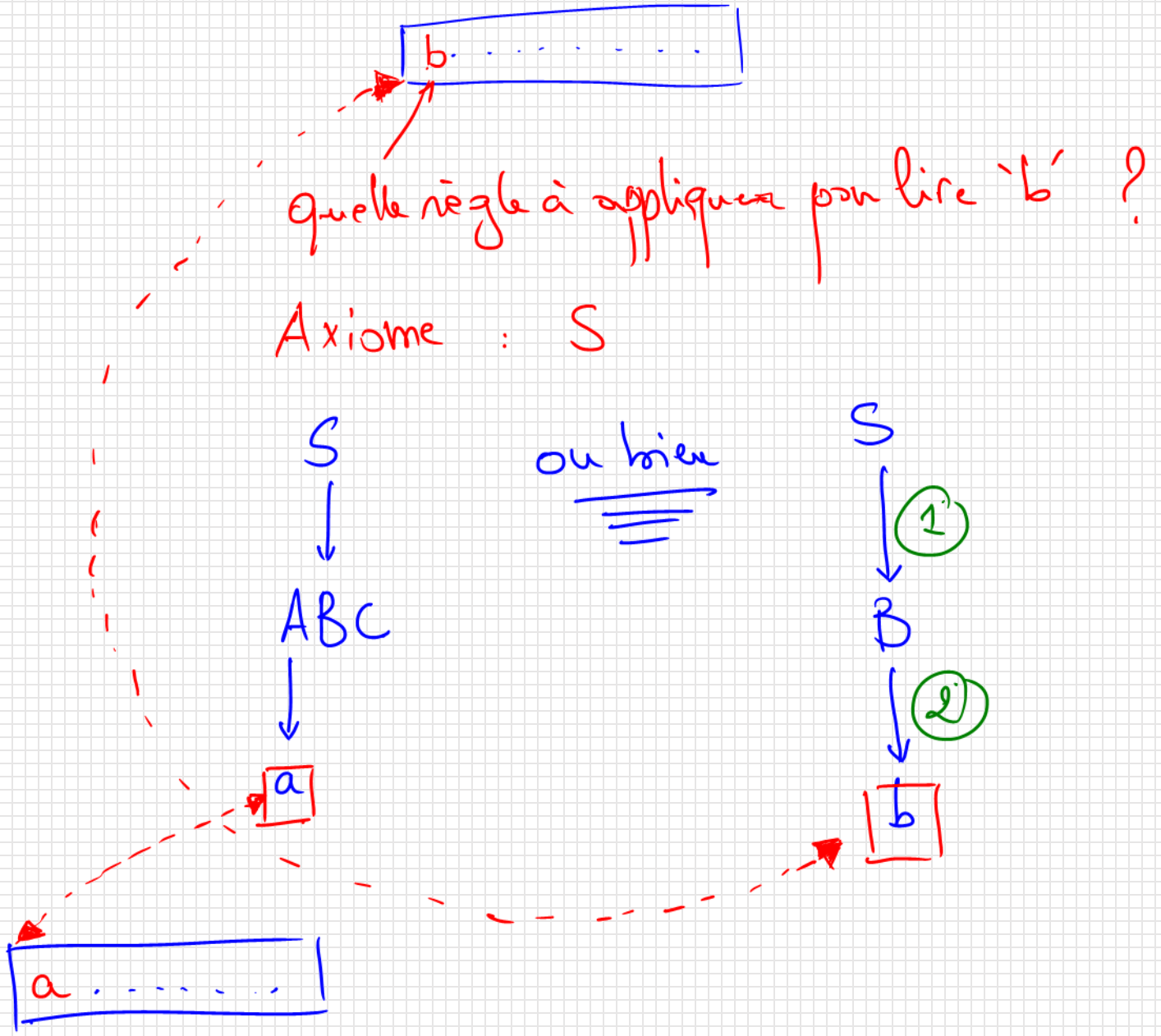
$S \longrightarrow ABC \mid B$

$A \longrightarrow a$

$B \longrightarrow b$

$C \longrightarrow c$





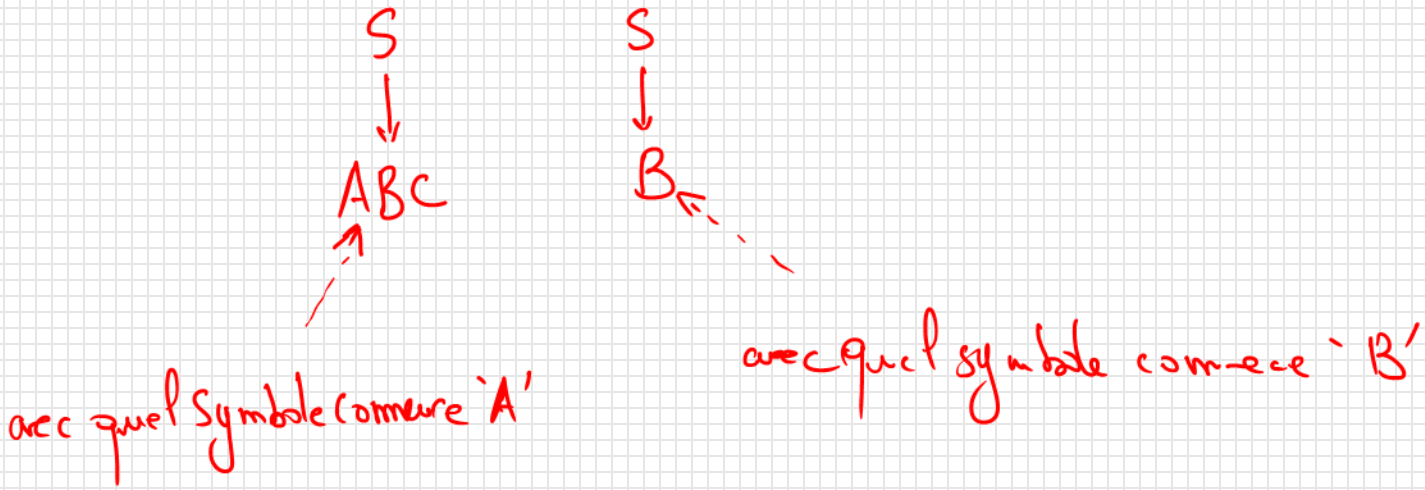
Exemple 1 :

S → ABC | B

A → a

B → b

C → c



Calcul du Premier : Ensemble des Symboles Terminaux avec lesquels peut commencer un symbole Non Terminal.

Premier (A) : " " " " " " A

Premier (B) : " " " " " " " B

Ex1

$S \rightarrow ABC \mid B$

$A \rightarrow a$

$B \rightarrow b$

$C \rightarrow c$

$Premier(A) = \{a\}$

$Premier(B) = \{b\}$

$Premier(C) = \{c\}$

$Premier(S) = Premier(A) \cup Premier(B)$

$Premier(S) = \{a\} \cup \{b\} = \{a, b\}$

Ex2

$S \rightarrow ABC$

$A \rightarrow a$

$B \rightarrow b$

$C \rightarrow c$

$Premier(A) = \{a\}$

$Premier(B) = \{b\}$

$Premier(C) = \{c\}$

$Premier(S) = Premier(A)$

$Premier(S) = \{a\}$

Ex3

@ ∈ alors $P(S) = P(B)$

$S \rightarrow ABC$

$A \rightarrow a \mid \varepsilon$

$B \rightarrow b$

$C \rightarrow c$

$Premier(A) = \{a, \varepsilon\}$

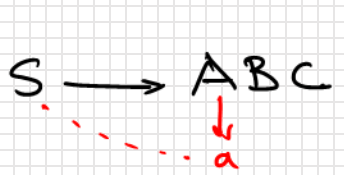
$Premier(B) = \{b\}$

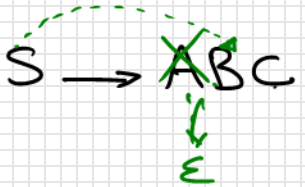
$Premier(C) = \{c\}$

$Premier(S) = Premier(A) \setminus \{\varepsilon\} \cup Premier(B)$

$= \{a, \varepsilon\} \setminus \{\varepsilon\} \cup \{b\}$

$P(S) = \{a, b\}$





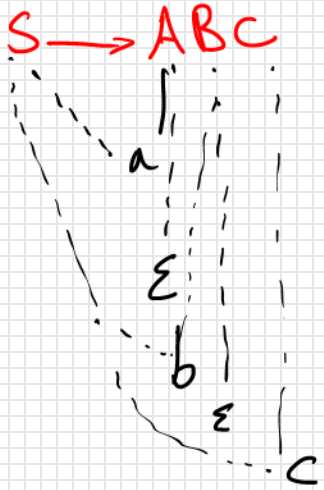
Ex4

$S \longrightarrow ABC$

$A \longrightarrow a \mid \varepsilon$

$B \longrightarrow b \mid \varepsilon$

$C \longrightarrow c$



$P(A) = \{a, \varepsilon\}$

$P(B) = \{b, \varepsilon\}$

$P(C) = \{c\}$

$P(S) = P(A) \setminus \{\varepsilon\} \cup P(B) \setminus \{\varepsilon\} \cup P(C)$

$P(S) = \{a, b, c\}$

Ex5

$S \longrightarrow ABC$

$A \longrightarrow a \mid \varepsilon$

$B \longrightarrow b \mid \varepsilon$

$C \longrightarrow c \mid \varepsilon$

$P(A) = \{a, \varepsilon\}$

$P(B) = \{b, \varepsilon\}$

$P(C) = \{c, \varepsilon\}$

$P(S) = P(A) \setminus \{\varepsilon\} \cup P(B) \setminus \{\varepsilon\} \cup P(C) \setminus \{\varepsilon\} \cup \ldots$

$= \{a, b, c, \varepsilon\}$

$P(A) = \{\varepsilon\}$ et $P(B) = \{\varepsilon\}$ et $P(C) \ni \varepsilon$ alors $P(S) = \{\varepsilon\}$

Grammaire ETF (Calculatrice basique) :

$E \longrightarrow TE'$

$E' \longrightarrow +TE' \mid -TE' \mid \varepsilon$

$T \longrightarrow FT'$

$T' \longrightarrow *FT' \mid \backslash FT' \mid \varepsilon$

$F \longrightarrow (E) \mid nb$

$V_n = \{E, E', T, T', F\}$

$V_t = \{+, -, *, \backslash, (,), nb\}$

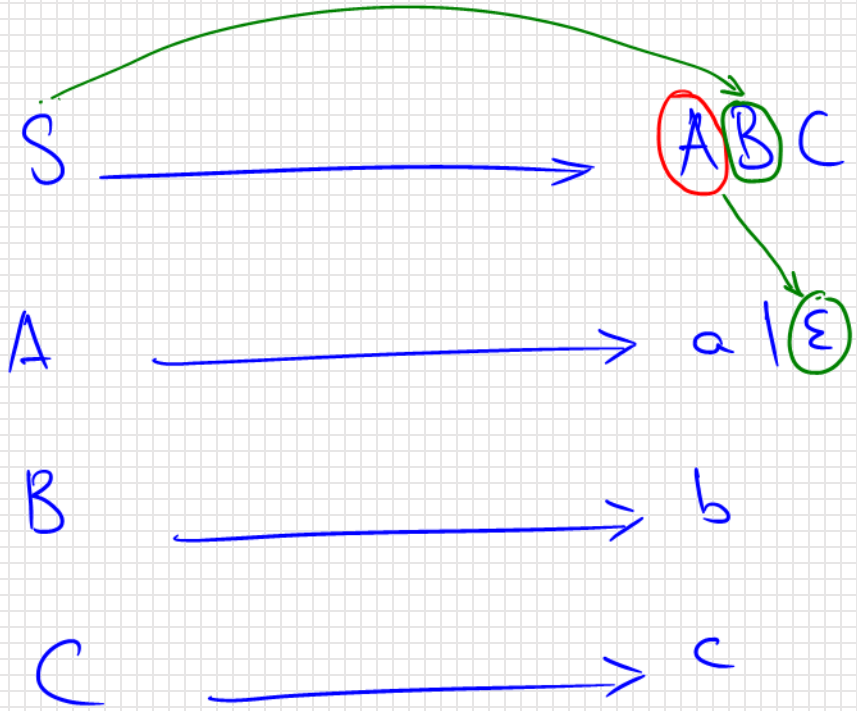
$P(E) = P(T) = \{(, nb\}$

$P(E') = \{+, -, \varepsilon\}$

$P(T) = P(F) = \{(, nb\}$

$P(T') = \{*, \backslash, \varepsilon\}$

$P(F) = \{(, nb\}$



$P(S) = P(A) \setminus \{\varepsilon\} \cup P(B) = \{a, b\}$

$Suivant(A) = Premier(B)$

Suivant (A) : Ensemble des Symboles Terminaux qui viennent juste après A

Suivant (B) : " " " " " " " " " " B

$S \rightarrow ABC$

$A \rightarrow a$

$B \rightarrow b$

$C \rightarrow c$

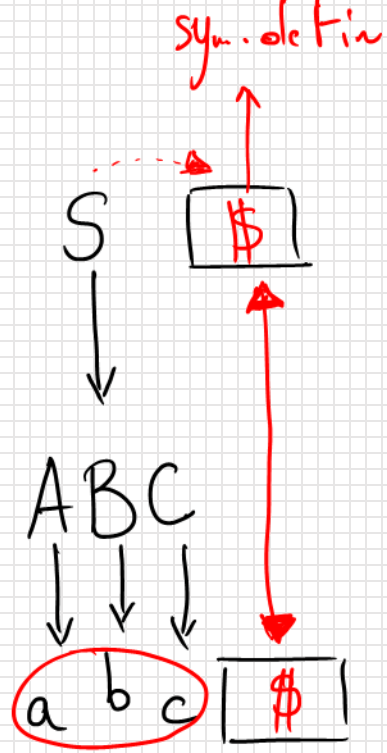
Ex^

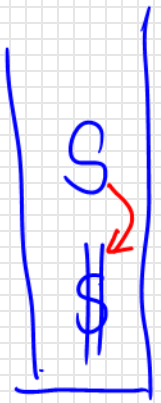
$Suivant(A) = P(B) = \{b\}$

$Suivant(B) = P(C) = \{c\}$

$Suivant(S) = \{\$\}$

$Suivant(C) = Suivant(S) = \{\$\}$





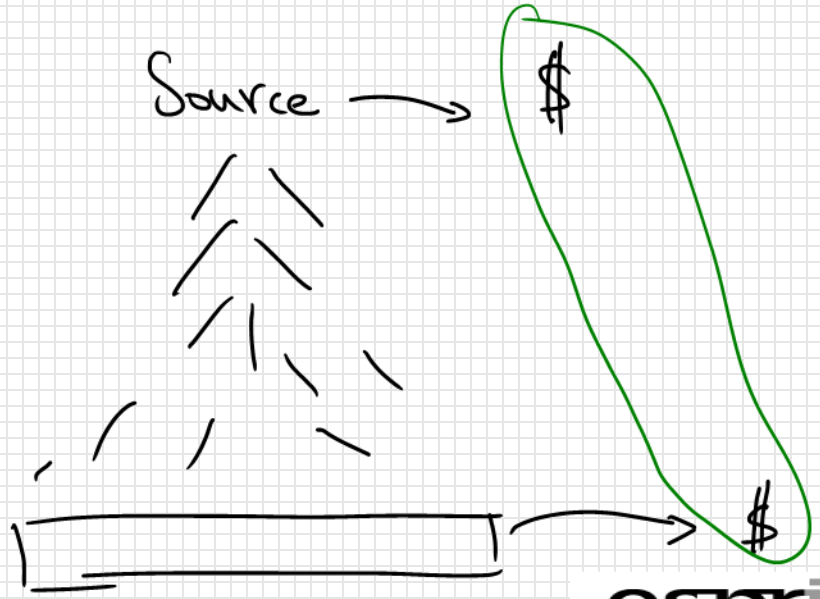
$Premier(A) = \{a\}$

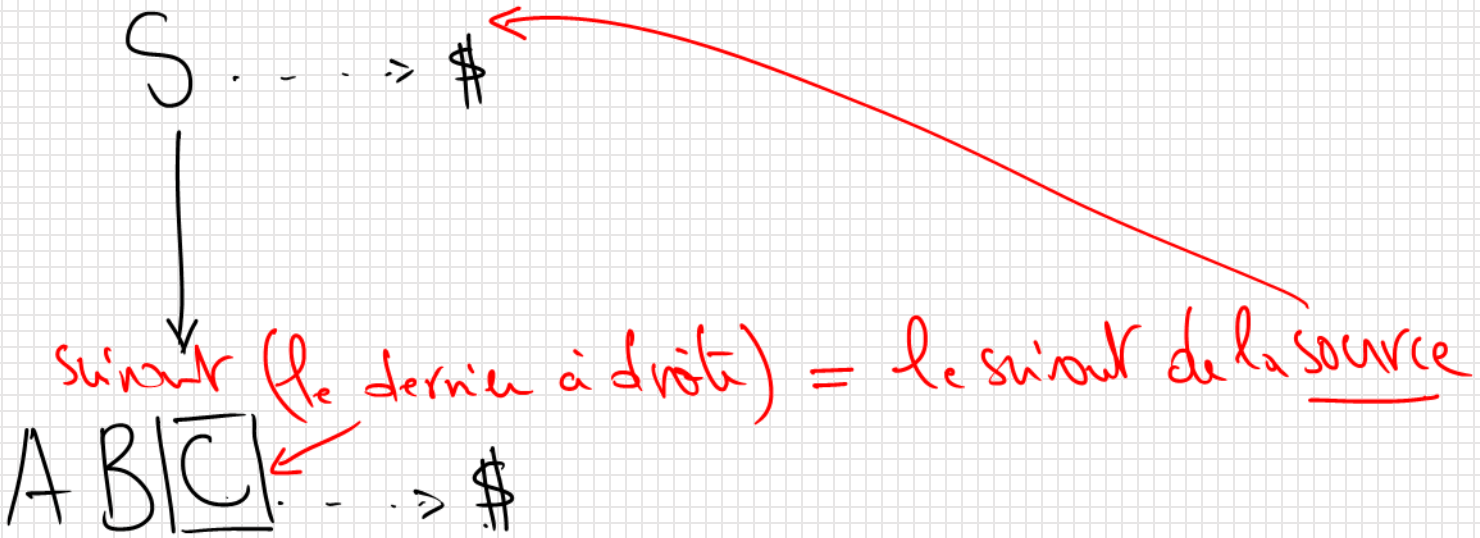
$Premier(B) = \{b\}$

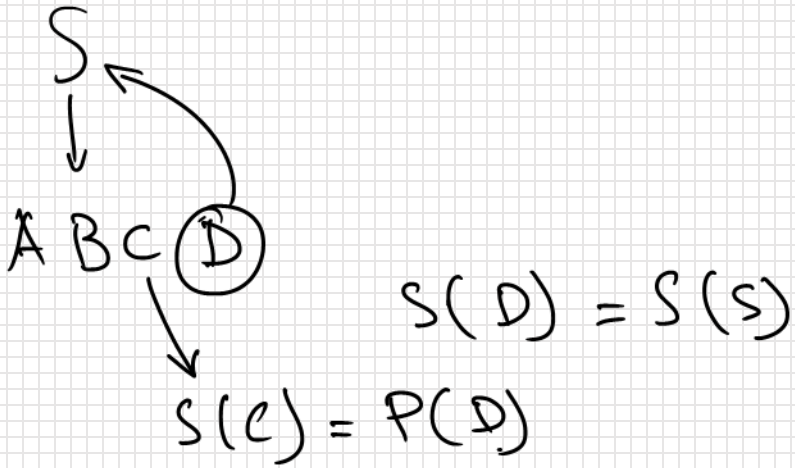
$Premier(C) = \{c\}$

$Premier(S) = Premier(A) \cup Premier(B)$

$Premier(S) = \{a\} \cup \{b\} = \{a, b\}$




S . . . -> $
suivant (le dernier à droite) = le suivant de la source
A B C . . . -> $


S
A B C D
S(D) = S(S)
S(C) = P(D)

Ex 2

$S \rightarrow ABC$

$A \rightarrow a$

$B \rightarrow b \mid \varepsilon$

$C \rightarrow c$

$Pr(A) = \{a\}$

$Pr(B) = \{b, \varepsilon\}$

$Pr(c) = \{c\}$

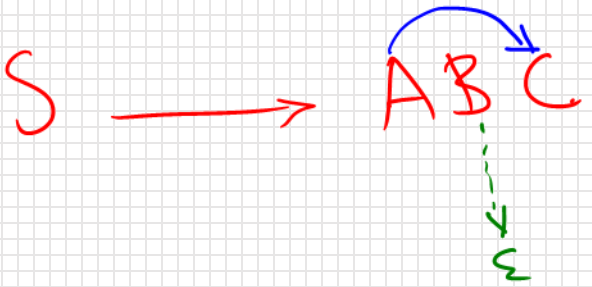
$S(A) = P(B) \setminus \{\varepsilon\} \cup P(C)$

$= \{b, c\}$

$S(B) = P(c) = \{c\}$

$S(c) = S(S) = \{\$\}$

$S(S) = \{\$\}$



Ex3

$S \longrightarrow ABC$

$A \longrightarrow a$

$B \longrightarrow b \mid \varepsilon$

$C \longrightarrow c \mid \varepsilon$

$P(S) = P(A) = \{a\}$

$P(A) = \{a\}$

$P(B) = \{b, \varepsilon\}$

$P(C) = \{c, \varepsilon\}$

$S(S) = \{\$\}$

$S(A) = P(B) \setminus \{\varepsilon\} \cup P(C) \setminus \{\varepsilon\} \cup S(S)$

$S(A) = \{b, c, \$\}$

$S(B) = P(C) \setminus \{\varepsilon\} \cup S(S) = \{c, \$\}$

$S(C) = S(S) = \{\$\}$

Ex 4

$S \longrightarrow ABC$

$A \longrightarrow a \mid \varepsilon$

$B \longrightarrow b \mid \varepsilon$

$C \longrightarrow c$

$P(A) = \{a, \varepsilon\}$

$P(B) = \{b, \varepsilon\}$

$P(c) = \{c\}$

$P(S) = P(A) \setminus \{\varepsilon\} \cup P(B) \setminus \{\varepsilon\} \cup P(C) = \{a, b, c\}$

$S(A) = P(B) \setminus \{\varepsilon\} \cup P(C) = \{b, c\}$

$S(B) = P(C) = \{c\}$

$S(C) = S(S) = \{\$\}$

$S(S) = \{\$\}$

Grammaire ETF (Calculatrice basique) :

$E \longrightarrow TE'$

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$T' \longrightarrow *FT' \mid \backslash FT' \mid \varepsilon$

$F \longrightarrow (E) \mid nb$

$V_n = \{E, E', T, T', F\}$

$V_t = \{+, -, *, \backslash, (,), nb\}$

$P(E) = P(T) = \{(, nb\}$

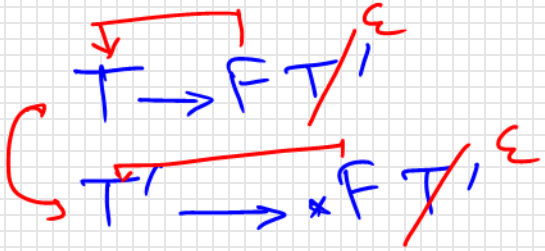
$P(E') = \{+, -, \varepsilon\}$

$P(T) = P(F) = \{(, nb\}$

$P(T') = \{*, \backslash, \varepsilon\}$

$P(F) = \{(, nb\}$

Premier



axiome

$F \rightarrow (E)$

$S(E) = \{\$,)\}$

$S(E') = S(E) = \{\$,)\}$

$S(T) = P(E') \setminus \{\varepsilon\} \cup S(E)$

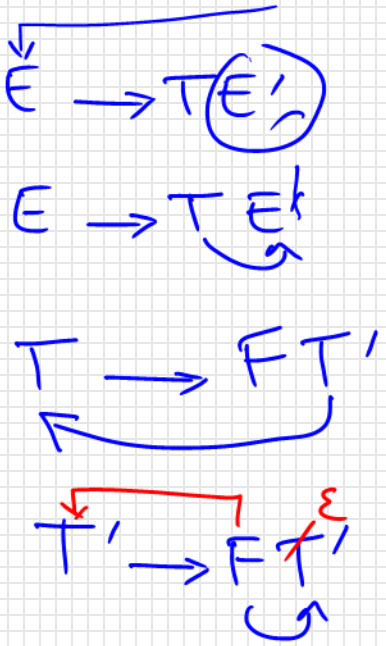
$= \{+, -, \$,)\}$

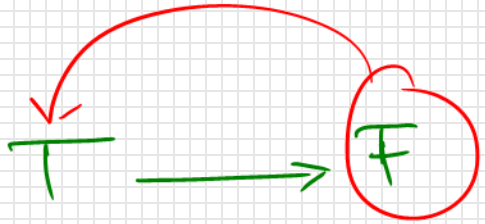
$S(T') = S(T) = \{+, -, \$,)\}$

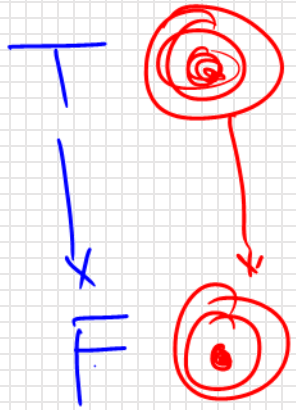
$S(F) = P(T') \setminus \{\varepsilon\} \cup S(T)$

$= \{*, \backslash, +, -, \$,)\}$

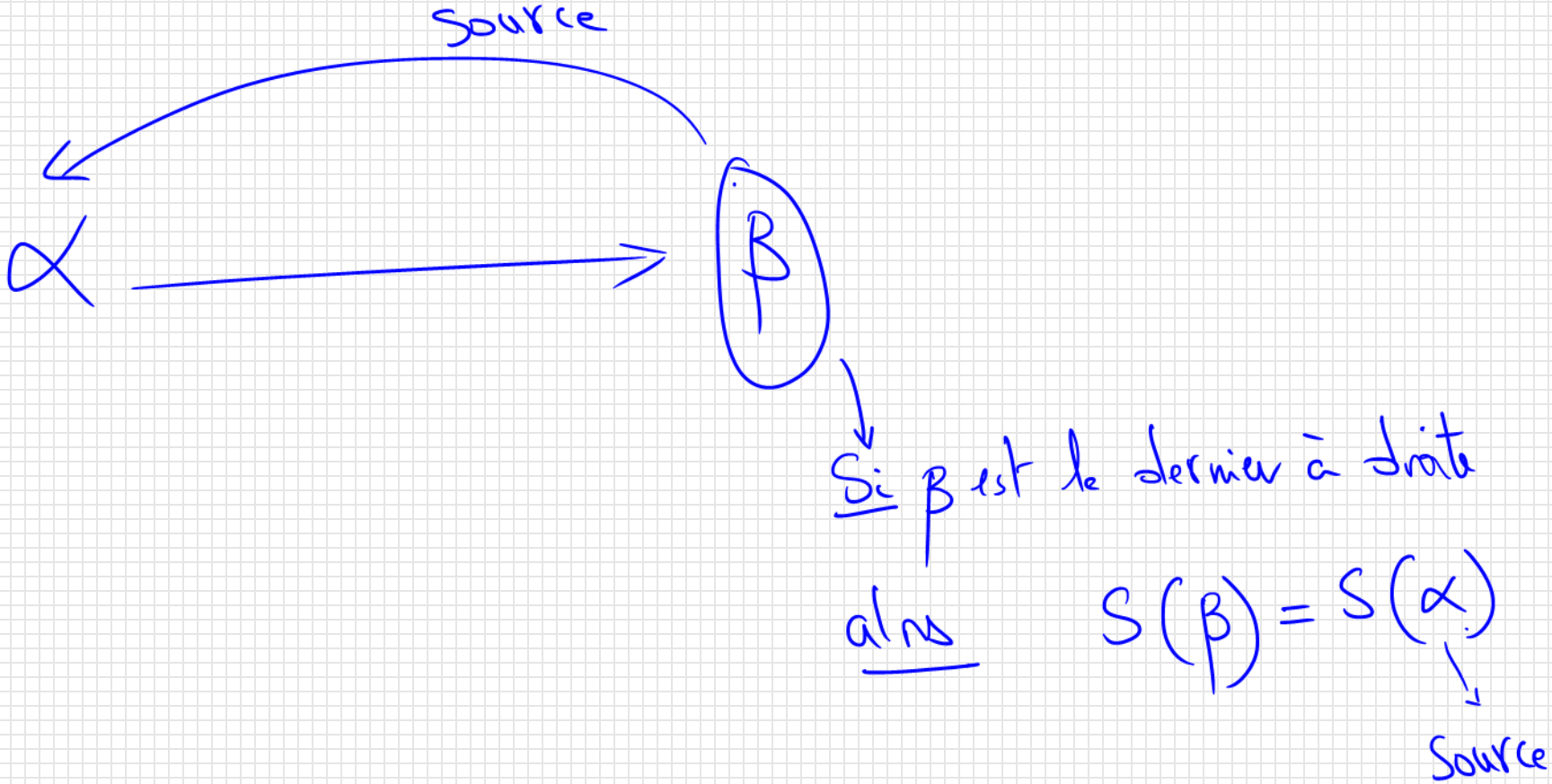
Suivant







si $P(T') = \varepsilon$ alors $S(F) = S(T)$


Source
α
β
Si β est le dernier à droite
alors
S(β) = S(α)
Source