

Verificação de Aprendizagem
Construção de uma Analisador Sintático SLR(1)

Linguagens Formais e Compiladores
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Seja G a seguinte GLC:

$$\begin{aligned}S &::= S \text{ or } A \mid A \\A &::= A \text{ and } B \mid B \\B &::= \text{not } B \mid (S) \mid \text{true} \mid \text{false}\end{aligned}$$

1. Construa os conjuntos de Itens SLR para a gramática (estendida);
2. Calcule a função GOTO para esses conjuntos de Itens;
3. Mostre a tabela de análise para essa gramática.
4. A gramática é SLR? Se sim, mostre as ações da sua tabela de análise para a entrada **not(true or false) and true**

1) $S' \rightarrow .S$

$S \rightarrow .S \text{ or } A \mid S.\text{or } A \mid S \text{ or } .A \mid S \text{ or } A.$

$S \rightarrow .A \mid A.$

$A \rightarrow .A \text{ and } B \mid A.\text{ and } B \mid A \text{ and } .B \mid A \text{ and } B.$

$A \rightarrow .B \mid B.$

$B \rightarrow .\text{not } B \mid \text{not}.B \mid \text{not } B.$

$B \rightarrow .(S) \mid (.S) \mid (S.) \mid (S).$

$B \rightarrow .\text{false} \mid \text{false}.$

$B \rightarrow .\text{true} \mid \text{true}.$

2) $([\{S \rightarrow S\}], S) = [S \rightarrow S, S \rightarrow S \text{ or } A, S \rightarrow S \cdot \text{or } A,$
 $S \rightarrow S \text{ or } A, S \rightarrow S \text{ or } A., S \rightarrow A, S \rightarrow A., A \rightarrow \cdot A \text{ and } B,$
 $A \rightarrow A \cdot \text{and } B, A \rightarrow A \text{ and } B, A \rightarrow A \text{ and } B., A \rightarrow \cdot B, A \rightarrow B,$
 $B \rightarrow \cdot \text{not } B, B \rightarrow \text{not } B, B \rightarrow \text{not } B., B \rightarrow \cdot (S), B \rightarrow (S),$
 $B \rightarrow (S.), B \rightarrow (S)., B \rightarrow \cdot \text{false}, B \rightarrow \text{false}, B \rightarrow \cdot \text{true},$
 $B \rightarrow \text{true}].$

$([\{S \rightarrow S \text{ or } A\}], S) = [S \rightarrow S \text{ or } A, S \rightarrow S \cdot \text{or } A,$
 $S \rightarrow S \text{ or } A, S \rightarrow S \text{ or } A., S \rightarrow A, S \rightarrow A., A \rightarrow \cdot A \text{ and } B,$
 $A \rightarrow A \cdot \text{and } B, A \rightarrow A \text{ and } B, A \rightarrow A \text{ and } B., A \rightarrow \cdot B, A \rightarrow B,$
 $B \rightarrow \cdot \text{not } B, B \rightarrow \text{not } B, B \rightarrow \text{not } B., B \rightarrow \cdot (S), B \rightarrow (S),$
 $B \rightarrow (S.), B \rightarrow (S)., B \rightarrow \cdot \text{false}, B \rightarrow \text{false}, B \rightarrow \cdot \text{true},$
 $B \rightarrow \text{true}].$

$([\{S \rightarrow S \text{ or } A\}], A) = [S \rightarrow S \text{ or } A, A \rightarrow \cdot A \text{ and } B,$
 $A \rightarrow A \cdot \text{and } B, A \rightarrow A \text{ and } B, A \rightarrow A \text{ and } B., A \rightarrow \cdot B, A \rightarrow B,$
 $B \rightarrow \cdot \text{not } B, B \rightarrow \text{not } B, B \rightarrow \text{not } B., B \rightarrow \cdot (S), B \rightarrow (S),$
 $B \rightarrow (S.), B \rightarrow (S)., B \rightarrow \cdot \text{false}, B \rightarrow \text{false}, B \rightarrow \cdot \text{true},$
 $B \rightarrow \text{true}].$

$$([\{S \rightarrow A\}], A) = [S \rightarrow A, A \rightarrow \neg A \text{ and } B,$$

$A \rightarrow A \cdot \neg A \text{ and } B$, $A \rightarrow A \text{ and } B$, $A \rightarrow \neg A \text{ and } B$, $A \rightarrow \neg B$, $A \rightarrow B$,
 $B \rightarrow \neg \neg B$, $\neg B \rightarrow \neg \neg \neg B$, $B \rightarrow \neg \neg B$, $B \rightarrow \neg B$, $B \rightarrow (S)$, $B \rightarrow (\neg S)$,
 $B \rightarrow (S \circ)$, $B \rightarrow (\neg S)$, $B \rightarrow \text{false}$, $B \rightarrow \text{false}$, $B \rightarrow \text{true}$,
 $B \rightarrow \text{true}$.

$$([\{A \rightarrow A \text{ and } B\}], A) = [A \rightarrow \neg A \text{ and } B,$$

$A \rightarrow A \cdot \neg A \text{ and } B$, $A \rightarrow A \text{ and } B$, $A \rightarrow \neg A \text{ and } B$, $A \rightarrow \neg B$, $A \rightarrow B$,
 $B \rightarrow \neg \neg B$, $\neg B \rightarrow \neg \neg \neg B$, $B \rightarrow \neg \neg B$, $B \rightarrow \neg B$, $B \rightarrow (S)$, $B \rightarrow (\neg S)$,
 $B \rightarrow (S \circ)$, $B \rightarrow (\neg S)$, $B \rightarrow \text{false}$, $B \rightarrow \text{false}$, $B \rightarrow \text{true}$,
 $B \rightarrow \text{true}$.

$$([\{A \rightarrow A \text{ and } \neg B\}], B) = [A \rightarrow A \text{ and } \neg B,$$

$B \rightarrow \neg \neg B$, $\neg B \rightarrow \neg \neg \neg B$, $B \rightarrow \neg \neg B$, $B \rightarrow \neg B$, $B \rightarrow (S)$, $B \rightarrow (\neg S)$,
 $B \rightarrow (S \circ)$, $B \rightarrow (\neg S)$, $B \rightarrow \text{false}$, $B \rightarrow \text{false}$, $B \rightarrow \text{true}$,
 $B \rightarrow \text{true}$.

$([\{B \rightarrow \text{not}.B\}], B) = [B \rightarrow \text{not}.B, B \rightarrow \text{not}.B, B \rightarrow .(S), B \rightarrow (.S),$
 $B \rightarrow (S_0), B \rightarrow (S), ., B \rightarrow .\text{false}, B \rightarrow \text{false}. , B \leftarrow .\text{true},$
 $B \rightarrow \text{true}].$

$([\{B \rightarrow (.S)\}], S) = [B \rightarrow (.S), S \rightarrow .S \text{ or } A, S \rightarrow S \text{ or } A,$
 $S \rightarrow S \text{ or } A, S \rightarrow S \text{ or } A., S \rightarrow A, S \rightarrow A., A \rightarrow .A \text{ and } B,$
 $A \rightarrow A \text{ and } B, A \rightarrow A \text{ and } B, A \rightarrow A \text{ and } B., A \rightarrow .B, A \rightarrow B,$
 $B \rightarrow .\text{not}B, B \rightarrow \text{not}.B, B \rightarrow \text{not}.B., B \rightarrow .(S), B \rightarrow (S_0),$
 $B \rightarrow (S)., B \rightarrow .\text{false}, B \rightarrow \text{false}. , B \leftarrow .\text{true}, B \rightarrow \text{true}].$

Firsts e Follows

$$F_1(B) = \{\text{not}, ., \text{true}, \text{false}\}$$

$$F_1(A) = \{\text{not}, ., \text{true}, \text{false}\}$$

$$F_1(S) = \{\text{not}, ., \text{true}, \text{false}\}$$

$$F_0(B) = \{\text{and}, \$, \text{or}, ()\}$$

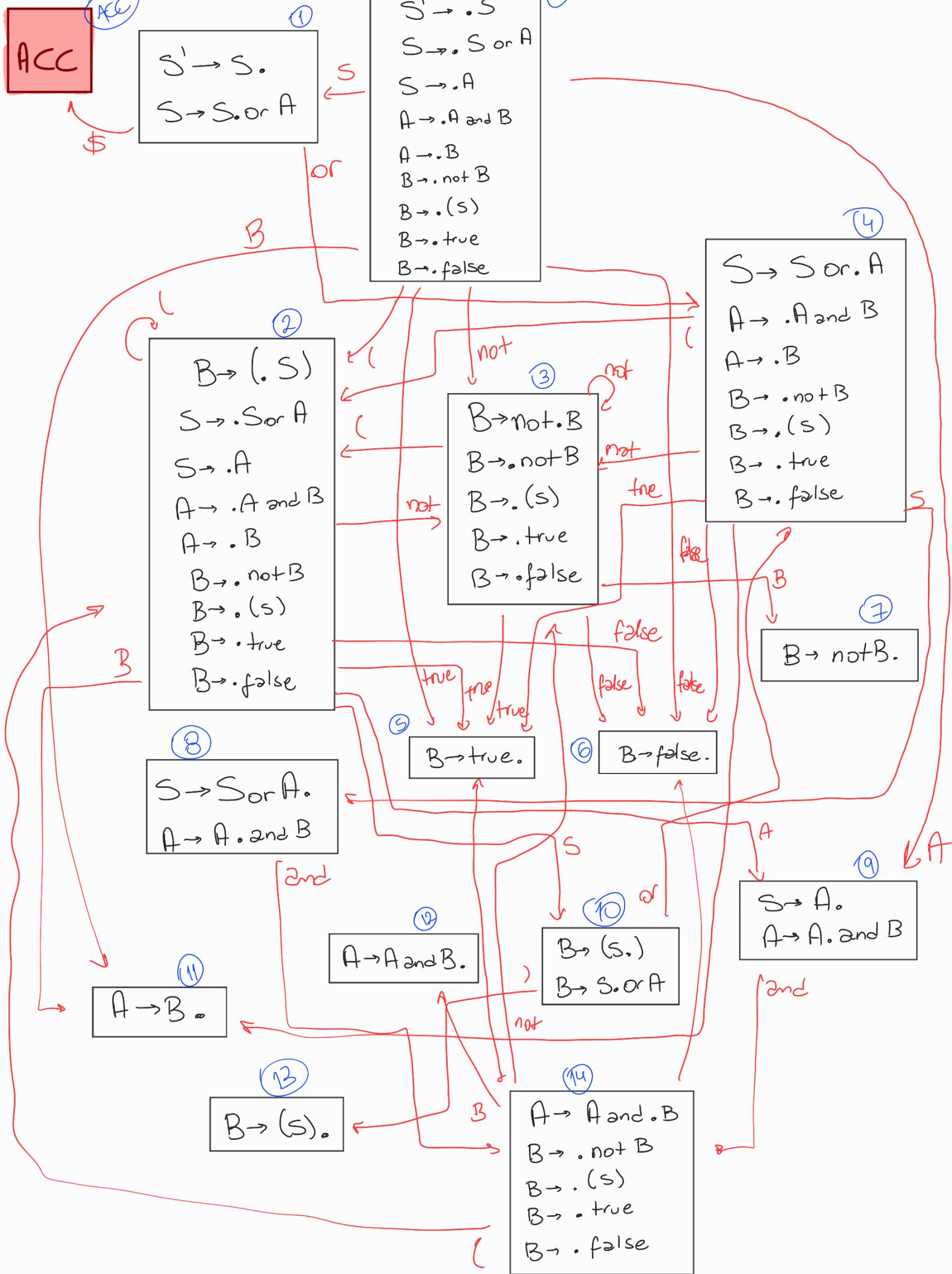
$$F_0(A) = \{\text{and}, \$, \text{or}, ()\}$$

$$F_0(S) = \{\$\, \text{or}, ()\}$$

$$\begin{array}{ll} S ::= & S \text{ or } A \mid A & (1, 2) \\ A ::= & A \text{ and } B \mid B & (3, 4) \\ B ::= & \text{not } B \mid (S) \mid \text{true} \mid \text{false} & \end{array}$$

5 6 7 8

3)

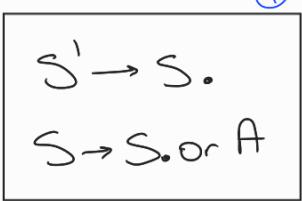
RESULTADO FINAL

PARCIAIS

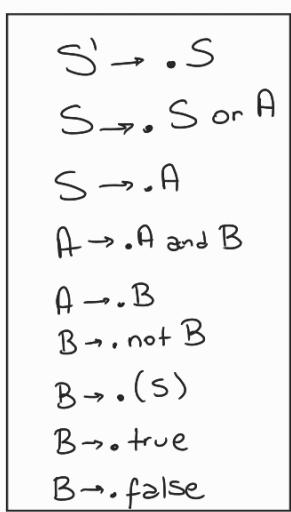
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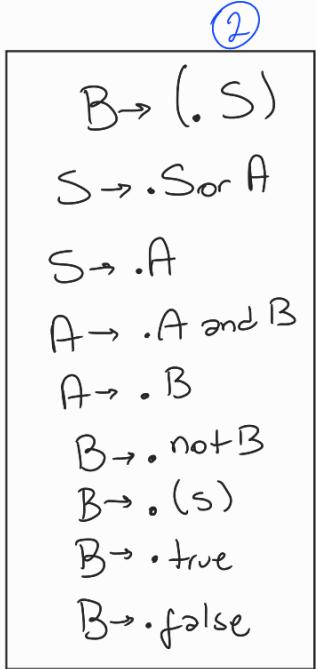
A
S
B



③

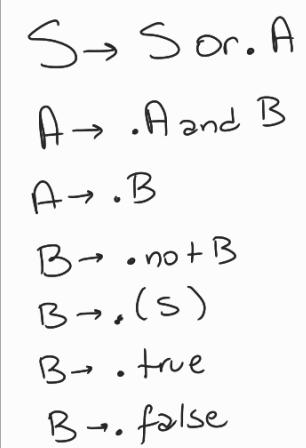
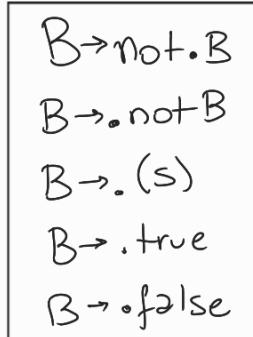
A
false

not

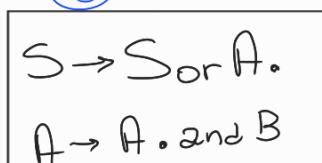


true

⑤



B → notB.



B → true.

B → false.

⑪

$$A \rightarrow B.$$

⑫

$$A \rightarrow A \text{ and } B.$$

⑬

$$B \rightarrow (S.)$$

$$B \rightarrow S \text{ or } A$$

⑭

$$S \rightarrow A.$$

$$A \rightarrow A \text{ and } B$$

⑮

$$B \rightarrow (S).$$

⑯

$$A \rightarrow A \text{ and }.B$$

$$B \rightarrow .\text{not } B$$

$$B \rightarrow .(S)$$

$$B \rightarrow .\text{true}$$

$$B \rightarrow .\text{false}$$

ACC

ACC

\$

OR

(1)

$$S' \rightarrow S.$$

$$S \rightarrow S \cdot \text{or } A$$

(0)

$$S' \rightarrow \cdot S$$

$$S \rightarrow \cdot S \text{ or } A$$

$$S \rightarrow \cdot A$$

$$A \rightarrow \cdot A \text{ and } B$$

$$A \rightarrow \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

1

(2)

$$B \rightarrow \cdot (S)$$

$$S \rightarrow \cdot S \text{ or } A$$

$$S \rightarrow \cdot A$$

$$A \rightarrow \cdot A \text{ and } B$$

$$A \rightarrow \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

(3)

$$B \rightarrow \text{not} \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

(4)

$$S \rightarrow S \text{ or. } A$$

$$A \rightarrow \cdot A \text{ and } B$$

$$A \rightarrow \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

(8)

$$S \rightarrow S \text{ or. } A$$

$$A \rightarrow A \cdot \text{and } B$$

(5)

$$B \rightarrow \text{true.}$$

(6)

$$B \rightarrow \text{false.}$$

(11)

$$A \rightarrow B \cdot$$

(9)

$$A \rightarrow A \text{ and. } B$$

(10)

$$B \rightarrow (S \cdot)$$

$$B \rightarrow S \cdot \text{or } A$$

(8)

$$S \rightarrow A \cdot$$

$$A \rightarrow A \cdot \text{and } B$$

(13)

$$B \rightarrow (S \cdot)$$

(14)

$$A \rightarrow A \text{ and. } B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

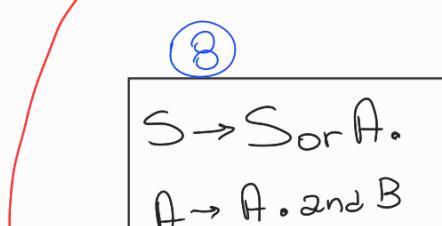
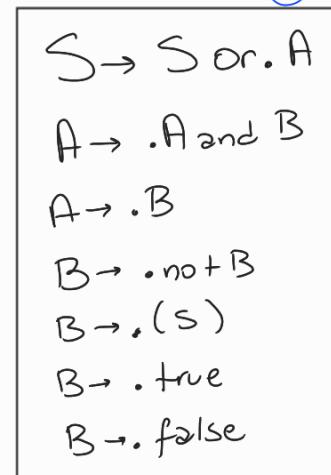
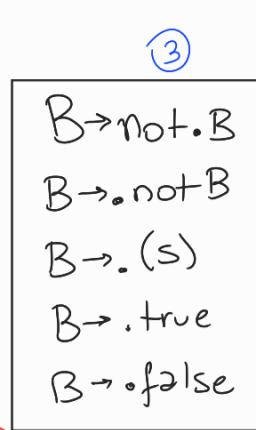
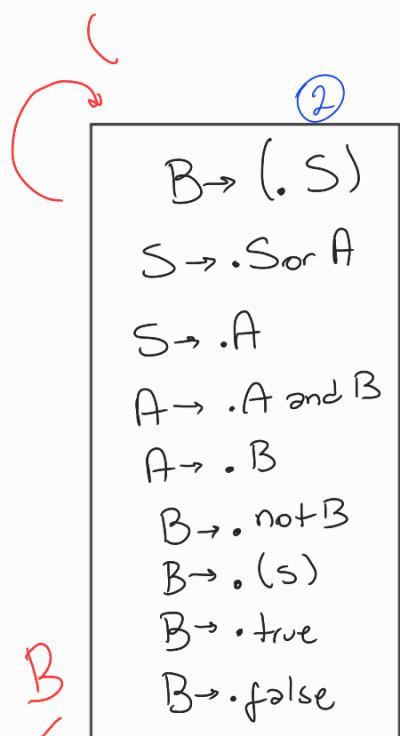
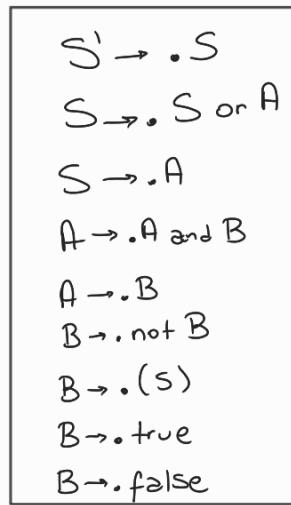
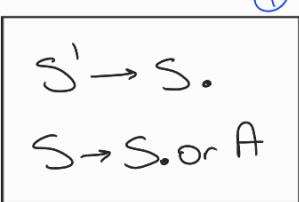
$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

L2

ACC

ACC



B → true.

B → false.

A → B \cdot B → (S) \cdot

A → A and B.

B → (S.)
B → S. or AS → A.
A → A. and BA → A and B
B → . not B
B → . (S)
B → . true
B → . false

B

not

A

false

S

true

S

true

⑦

B → not B.

⑨

⑩

⑪

B → (S.)
B → S. or A

A → A and B.

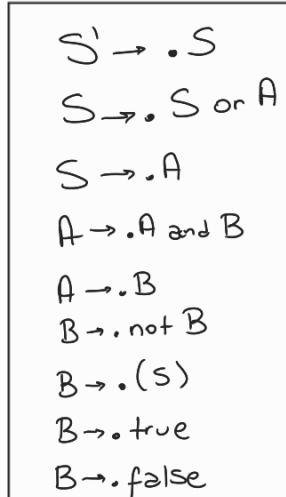
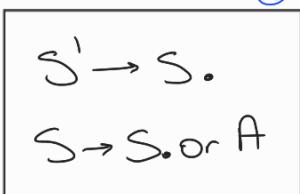
⑫

A → A and B
B → . not B
B → . (S)
B → . true
B → . false

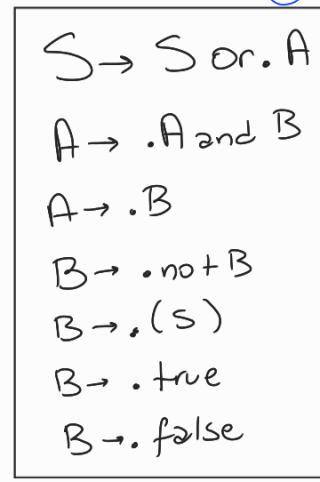
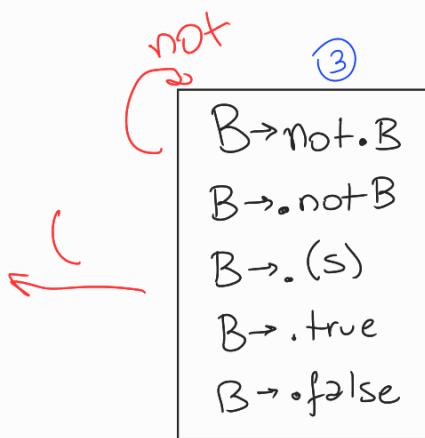
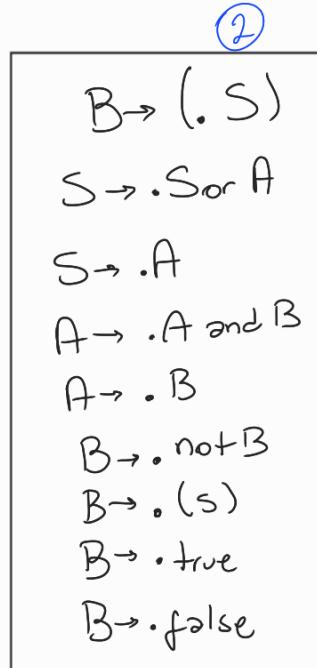
⑬

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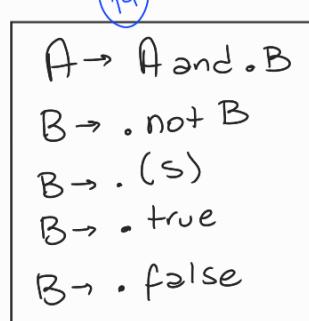
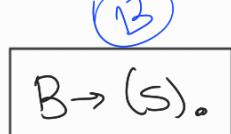
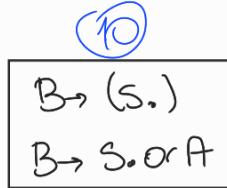
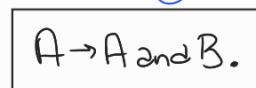
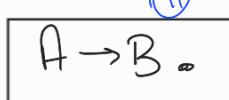
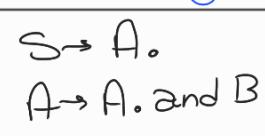
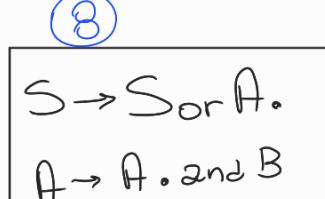
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3



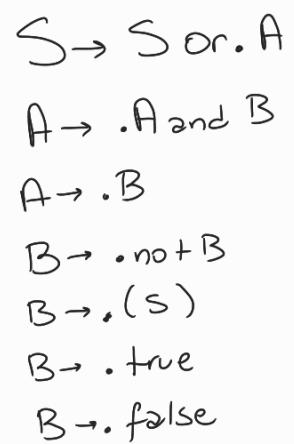
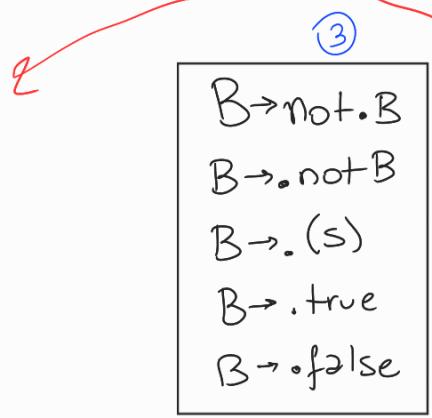
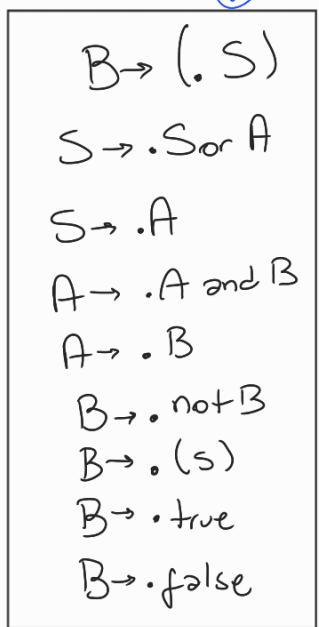
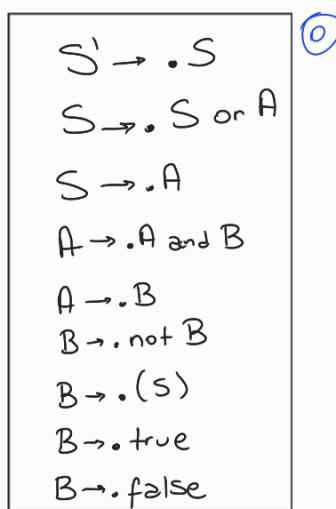
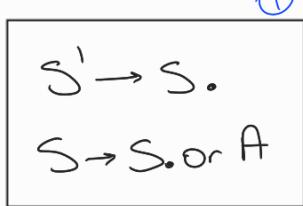
7



4

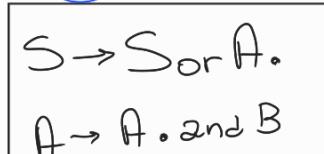
ACC

ACC



⑦

$B \rightarrow \cdot \text{not } B$

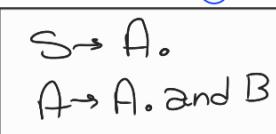
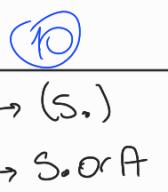


⑤

$B \rightarrow \cdot \text{true}$

⑥

$B \rightarrow \cdot \text{false}$



⑪

$A \rightarrow B \cdot$

⑫

$A \rightarrow A \text{ and. } B$

⑬

$B \rightarrow (S) \cdot$
$B \rightarrow S \cdot \text{or } A$

⑭

$B \rightarrow (S) \cdot$

⑮

$A \rightarrow A \text{ and. } B$
$B \rightarrow \cdot \text{not } B$
$B \rightarrow \cdot (S)$
$B \rightarrow \cdot \text{true}$
$B \rightarrow \cdot \text{false}$

ACC

ACC

①

$S' \rightarrow S.$
 $S \rightarrow S \cdot \text{or } A$

①
 $S' \rightarrow S$
 $S \rightarrow S \cdot \text{or } A$
 $S \rightarrow \cdot A$
 $A \rightarrow \cdot A \text{ and } B$
 $A \rightarrow \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

15

④

$S \rightarrow S \cdot \text{or } A$

$A \rightarrow \cdot A \text{ and } B$
 $A \rightarrow \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

②
 $B \rightarrow \cdot (S)$
 $S \rightarrow S \cdot \text{or } A$
 $S \rightarrow \cdot A$
 $A \rightarrow \cdot A \text{ and } B$
 $A \rightarrow \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

③

$B \rightarrow \text{not } \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

⑦

$B \rightarrow \text{not } B.$

⑧
 $S \rightarrow S \cdot \text{or } A$
 $A \rightarrow A \cdot \text{and } B$

⑤
 $B \rightarrow \text{true}.$
 $B \rightarrow \text{false}.$
 reduce
 $Fo(B) : n^2$

⑨

$S \rightarrow A.$
 $A \rightarrow A \cdot \text{and } B$

⑪
 $A \rightarrow B \cdot$

⑩
 $A \rightarrow A \text{ and } B.$

⑫
 $B \rightarrow (S \cdot)$
 $B \rightarrow S \cdot \text{or } A$

⑬
 $B \rightarrow (S).$

⑭
 $A \rightarrow A \text{ and } \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

ACC

ACC

①

$S' \rightarrow S.$
$S \rightarrow S. \text{ or } A$

①

$S' \rightarrow .S$
$S \rightarrow .S \text{ or } A$
$S \rightarrow .A$
$A \rightarrow .A \text{ and } B$
$A \rightarrow .B$
$B \rightarrow .\text{not } B$
$B \rightarrow .(S)$
$B \rightarrow .\text{true}$
$B \rightarrow .\text{false}$

16

②

$B \rightarrow (.S)$
$S \rightarrow .S \text{ or } A$
$S \rightarrow .A$
$A \rightarrow .A \text{ and } B$
$A \rightarrow .B$
$B \rightarrow .\text{not } B$
$B \rightarrow .(S)$
$B \rightarrow .\text{true}$
$B \rightarrow .\text{false}$

③

$B \rightarrow \text{not}.B$
$B \rightarrow .\text{not } B$
$B \rightarrow .(S)$
$B \rightarrow .\text{true}$
$B \rightarrow .\text{false}$

④

$S \rightarrow S \text{ or }.A$
$A \rightarrow .A \text{ and } B$
$A \rightarrow .B$
$B \rightarrow .\text{not } B$
$B \rightarrow .(S)$
$B \rightarrow .\text{true}$
$B \rightarrow .\text{false}$

⑤

$B \rightarrow \text{not } B.$

⑥

$S \rightarrow S \text{ or } A.$
$A \rightarrow A. \text{ and } B$

⑦

$B \rightarrow \text{true}.$

⑧

$B \rightarrow \text{false}.$

redução
FO(B): rB

⑨

$S \rightarrow A.$
$A \rightarrow A. \text{ and } B$

⑩

$A \rightarrow A \text{ and } B.$

⑪

$B \rightarrow (S.)$
$B \rightarrow S. \text{ or } A$

⑫

⑬

⑭

$B \rightarrow (S).$

⑮

$A \rightarrow A \text{ and }.B$
$B \rightarrow .\text{not } B$
$B \rightarrow .(S)$
$B \rightarrow .\text{true}$
$B \rightarrow .\text{false}$

ACC

ACC

①

$S' \rightarrow S.$
 $S \rightarrow S \cdot \text{or } A$

①
 $S' \rightarrow S$
 $S \rightarrow S \cdot \text{or } A$
 $S \rightarrow \cdot A$
 $A \rightarrow \cdot A \text{ and } B$
 $A \rightarrow \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

17

④

$S \rightarrow S \cdot \text{or } A$

$A \rightarrow \cdot A \text{ and } B$
 $A \rightarrow \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

②

$B \rightarrow \cdot (S)$
 $S \rightarrow S \cdot \text{or } A$
 $S \rightarrow \cdot A$
 $A \rightarrow \cdot A \text{ and } B$
 $A \rightarrow \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

③

$B \rightarrow \text{not} \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

⑦

$B \rightarrow \text{not } B$

reduces
 $\text{FO}(B) : rS$

⑧

$S \rightarrow S \cdot \text{or } A$
 $A \rightarrow A \cdot \text{and } B$

⑤

$B \rightarrow \text{true.}$

⑥

$B \rightarrow \text{false.}$

⑨

$S \rightarrow A$
 $A \rightarrow A \cdot \text{and } B$

⑪
 $A \rightarrow B \cdot \text{ }$

⑫
 $A \rightarrow A \text{ and } B$

⑩
 $B \rightarrow (S \cdot)$
 $B \rightarrow S \cdot \text{or } A$

⑬

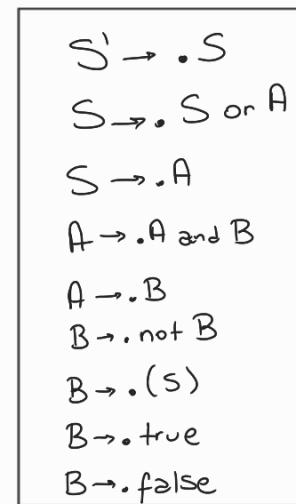
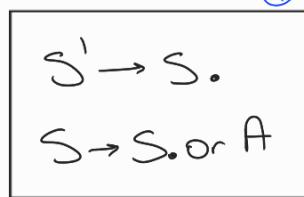
$B \rightarrow (S).$

⑭

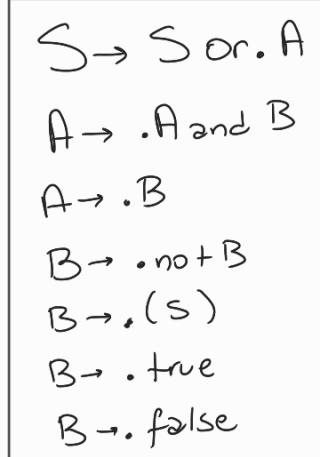
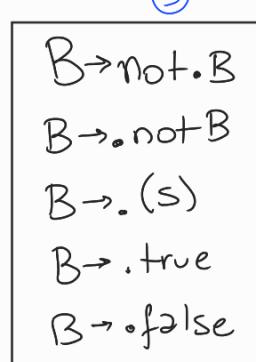
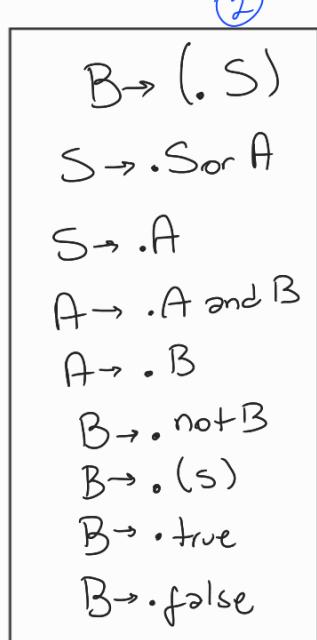
$A \rightarrow A \text{ and } B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

ACC

ACC

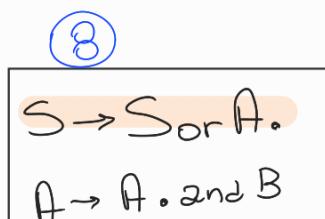


18



⑦

$B \rightarrow \cdot \text{not } B$

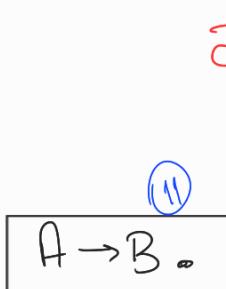


reduced
FD(S): r1

⑤

$$B \rightarrow \cdot \text{true}$$

⑥

$$B \rightarrow \cdot \text{false}$$


⑫

$$A \rightarrow A \cdot \text{ and } B$$

⑩

$$B \rightarrow (S \cdot)$$

$$B \rightarrow S \cdot \text{ or } A$$

⑨

$$S \rightarrow A \cdot$$

$$A \rightarrow A \cdot \text{ and } B$$

⑬

$$B \rightarrow (S) \cdot$$

⑭

$$A \rightarrow A \cdot \text{ and } B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

ACC

①
 $S' \rightarrow S.$
 $S \rightarrow S. \text{ or } A$

⑥
 $S \rightarrow .S$
 $S \rightarrow .S \text{ or } A$
 $S \rightarrow .A$
 $A \rightarrow .A \text{ and } B$
 $A \rightarrow .B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

9

②
 $B \rightarrow .(S)$
 $S \rightarrow .S \text{ or } A$
 $S \rightarrow .A$
 $A \rightarrow .A \text{ and } B$
 $A \rightarrow .B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

③
 $B \rightarrow \text{not}.B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

④
 $S \rightarrow S \text{ or }.A$
 $A \rightarrow .A \text{ and } B$
 $A \rightarrow .B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

⑦
 $B \rightarrow \text{not } B.$

⑧
 $S \rightarrow S \text{ or } A.$
 $A \rightarrow A. \text{ and } B$

⑤
 $B \rightarrow \text{true}.$ ⑥
 $B \rightarrow \text{false}.$

redgreen
 $\text{FO}(S) = \Gamma_2$

9

⑪
 $A \rightarrow B.$

⑨
 $A \rightarrow A \text{ and } B.$

⑩
 $B \rightarrow (S.)$
 $B \rightarrow S. \text{ or } A$

⑫
 $S \rightarrow A.$
 $A \rightarrow A. \text{ and } B$

and 1

⑬
 $B \rightarrow (S).$

⑭
 $A \rightarrow A \text{ and }.B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

ACC

ACC

10

①

$$S' \rightarrow S.$$

$$S \rightarrow S \cdot \text{or } A$$

①

$$S' \rightarrow S$$

$$S \rightarrow S \cdot \text{or } A$$

$$S \rightarrow \cdot A$$

$$A \rightarrow \cdot A \text{ and } B$$

$$A \rightarrow \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

②

$$B \rightarrow \cdot (S)$$

$$S \rightarrow S \cdot \text{or } A$$

$$S \rightarrow \cdot A$$

$$A \rightarrow \cdot A \text{ and } B$$

$$A \rightarrow \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

③

$$B \rightarrow \text{not} \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

④

$$S \rightarrow S \cdot \text{or } A$$

$$A \rightarrow \cdot A \text{ and } B$$

$$A \rightarrow \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

$$B \rightarrow \cdot \text{false}$$

⑤

$$S \rightarrow S \cdot \text{or } A$$

$$A \rightarrow A \cdot \text{and } B$$

⑥

$$B \rightarrow \text{true}.$$

⑦

$$B \rightarrow \text{false}.$$

⑧

$$S \rightarrow A.$$

$$A \rightarrow A \cdot \text{and } B$$

⑨

$$A \rightarrow B \cdot$$

⑩

$$A \rightarrow A \text{ and } B.$$

⑪

$$B \rightarrow (S \cdot)$$

$$B \rightarrow S \cdot \text{or } A$$

⑫

$$B \rightarrow (S).$$

⑬

$$A \rightarrow A \text{ and } \cdot B$$

$$B \rightarrow \cdot \text{not } B$$

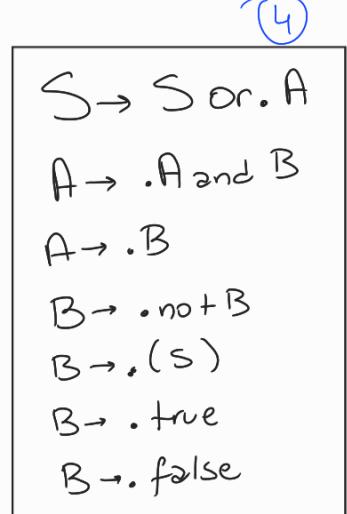
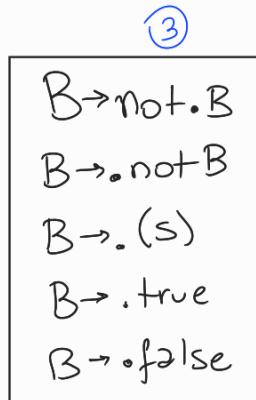
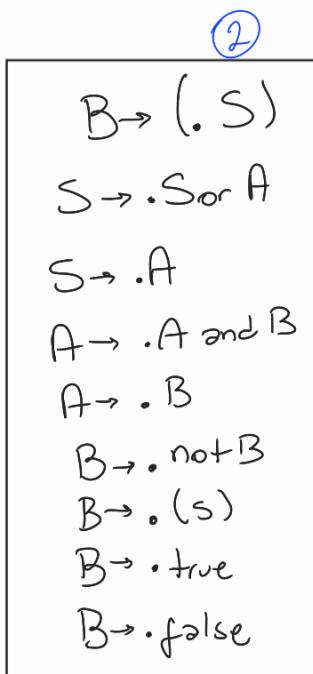
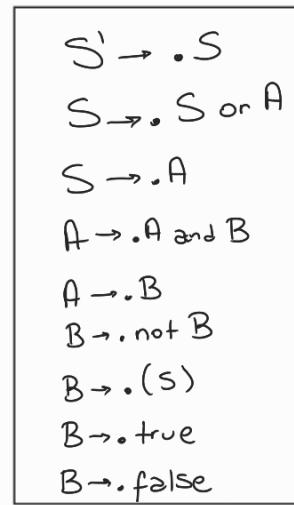
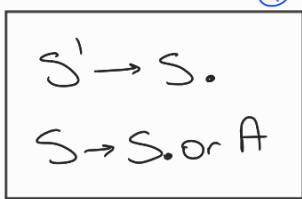
$$B \rightarrow \cdot (S)$$

$$B \rightarrow \cdot \text{true}$$

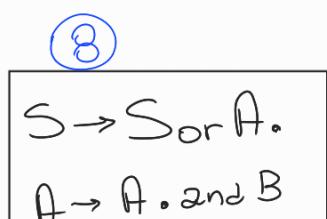
$$B \rightarrow \cdot \text{false}$$

ACC

ACC



⑦

$$B \rightarrow \text{not } B.$$


⑤ $B \rightarrow \text{true.}$ ⑥ $B \rightarrow \text{false.}$

⑪ $A \rightarrow B \cdot$

⑨ $A \rightarrow A \text{ and } B.$

⑩ $\begin{array}{l} B \rightarrow (S \cdot) \\ B \rightarrow S \cdot \text{or } A \end{array}$

⑯ $\begin{array}{l} S \rightarrow A \cdot \\ A \rightarrow A \cdot \text{and } B \end{array}$

reduced

$F_0(A) = n_4$

⑫ $B \rightarrow (S).$

⑭ $\begin{array}{l} A \rightarrow A \text{ and. } B \\ B \rightarrow \cdot \text{not } B \\ B \rightarrow \cdot (S) \\ B \rightarrow \cdot \text{true} \\ B \rightarrow \cdot \text{false} \end{array}$

ACC

ACC

①

$S' \rightarrow S.$
 $S \rightarrow S \cdot \text{or } A$

①
 $S' \rightarrow S$
 $S \rightarrow S \cdot \text{or } A$
 $S \rightarrow \cdot A$
 $A \rightarrow \cdot A \text{ and } B$
 $A \rightarrow \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

12

②

$B \rightarrow \cdot (S)$
 $S \rightarrow S \cdot \text{or } A$
 $S \rightarrow \cdot A$
 $A \rightarrow \cdot A \text{ and } B$
 $A \rightarrow \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

③

$B \rightarrow \text{not} \cdot B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

④

$B \rightarrow \text{not } B.$

⑤

$S \rightarrow S \cdot \text{or } A.$
 $A \rightarrow A \cdot \text{and } B$

⑥

$B \rightarrow \text{true}.$

⑦

$B \rightarrow \text{false}.$

⑧

$S \rightarrow A.$
 $A \rightarrow A \cdot \text{and } B$

⑨

$A \rightarrow A \text{ and } B.$

⑩

$B \rightarrow (S \cdot)$
 $B \rightarrow S \cdot \text{or } A$

⑪
 $A \rightarrow B \cdot$

reduced

FQ(A): r3

⑫

$B \rightarrow (S).$

⑬

$A \rightarrow A \text{ and } B$
 $B \rightarrow \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

ACC

(1)

$S' \rightarrow S.$
 $S \rightarrow S \text{ or } A$

(1)

①
 $S' \rightarrow S$
 $S \rightarrow S \text{ or } A$
 $S \rightarrow A$
 $A \rightarrow A \text{ and } B$
 $A \rightarrow B$
 $B \rightarrow \text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

13

②
 $B \rightarrow .(S)$
 $S \rightarrow .S \text{ or } A$
 $S \rightarrow .A$
 $A \rightarrow .A \text{ and } B$
 $A \rightarrow .B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

③
 $B \rightarrow \text{not}.B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

④
 $S \rightarrow S \text{ or }.A$
 $A \rightarrow .A \text{ and } B$
 $A \rightarrow .B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

⑤

$B \rightarrow \text{not}.B.$

⑥
 $S \rightarrow S \text{ or }.A.$
 $A \rightarrow A \text{ and } B$

⑦
 $B \rightarrow \text{true}.$

⑧
 $B \rightarrow \text{false}.$

⑪
 $A \rightarrow B.$

⑨
 $A \rightarrow A \text{ and } B.$

⑩
 $B \rightarrow (S.)$
 $B \rightarrow S \text{ or } A$

⑫
 $S \rightarrow A.$
 $A \rightarrow A \text{ and } B$

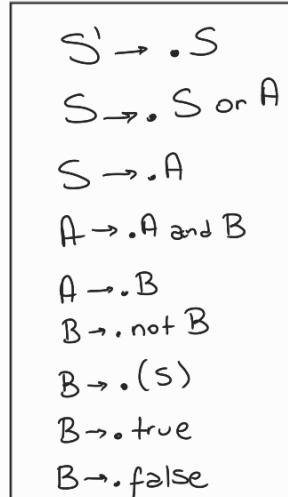
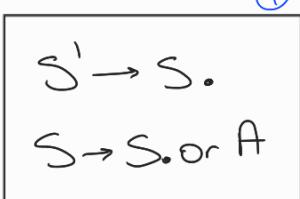
⑬
 $B \rightarrow (S).$

⑭
 $A \rightarrow A \text{ and }.B$
 $B \rightarrow .\text{not } B$
 $B \rightarrow .(S)$
 $B \rightarrow .\text{true}$
 $B \rightarrow .\text{false}$

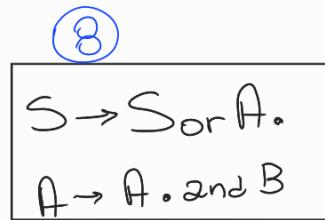
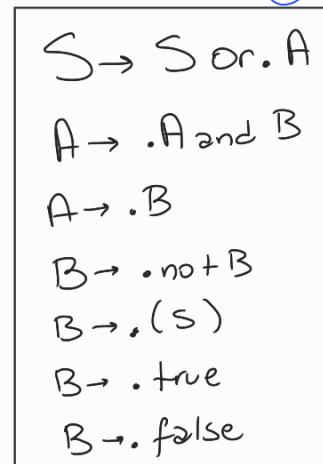
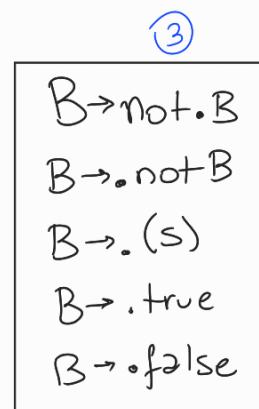
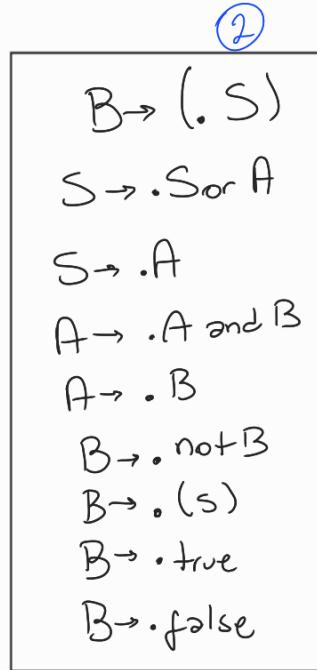
redc50
 $F_0(B): r6$

ACC

ACC



14



⑤ $B \rightarrow \text{true}.$

⑥ $B \rightarrow \text{false}.$

⑦

⑦ $B \rightarrow \text{not } B.$

⑪ $A \rightarrow B \cdot$

⑫ $A \rightarrow A \cdot \text{and } B.$

⑬ $B \rightarrow (S).$

⑭ $B \rightarrow (S \cdot)$
 $B \rightarrow S \cdot \text{or } A$

⑯ $S \rightarrow A.$
 $A \rightarrow A \cdot \text{and } B$

⑮ $A \rightarrow A \cdot \text{and } B$
 $B \rightarrow B \cdot \text{not } B$
 $B \rightarrow \cdot (S)$
 $B \rightarrow \cdot \text{true}$
 $B \rightarrow \cdot \text{false}$

⑯ $B \rightarrow \text{true}$ false not

ESTADO	Ações							Desvios			
	and	not	or	()	true	false	\$	S	A	B
0	s3			s2		s5	s6		1	9	11
1		s4						ACC			
2	s3		s2			s5	s6				
3	s3		s2			s5	s6				
4	s3		s2			s5	s6				
5	r7		r7			r7					
6	r8		r8			r8					
7	r5		r5			r5					
8	s14		r1			r1					
9	s14		r2			r2					
10		s4	s13								
11	r4		r4			r4					
12	r3		r3			r3					
13	r6		r6			r6					
14	s3	s2		s5	s6						12

4) not (true or false) and true

$\underline{S} \rightarrow \underline{A} \rightarrow \underline{A}$ and $\underline{B} \rightarrow \underline{A}$ and true $\rightarrow \underline{B}$ and true $\rightarrow \text{not } \underline{B}$ and true
 $\rightarrow \text{not } (\underline{S})$ and true $\rightarrow \text{not } (\underline{S} \text{ or } \underline{A})$ and true \rightarrow
 $\text{not } (\underline{S} \text{ or } \underline{B})$ and true $\rightarrow \text{not } (\underline{S} \text{ or false})$ and true \rightarrow
 $\text{not } (\underline{A} \text{ or false})$ and true $\rightarrow \text{not } (\underline{B} \text{ or false})$ and true \rightarrow
 $\rightarrow \text{not } (\text{true or false})$ and true.

$$\begin{aligned} S &::= S \text{ or } A \mid A & (1, 2) \\ A &::= A \text{ and } B \mid B & (3, 4) \\ B &::= \text{not } B \mid (S) \mid \text{true} \mid \text{false} & (5, 6, 7, 8) \end{aligned}$$

ESTADO	Ações							Desvios			
	and	not	or	()	true	false	\$	S	A	B
0		s3		s2		s5	s6		1	9	11
1			s4					ACC			
2		s3		s2		s5	s6		10	9	11
3		s3		s2		s5	s6				7
4		s3		s2		s5	s6			8	11
5	r7		r7		r7			r7			
6	r8		r8		r8			r8			
7	r5		r5		r5			r5			
8	s14		r1		r1			r1			
9	s14		r2		r2			r2			
10		s4		s13							
11	r4		r4		r4			r4			
12	r3		r3		r3			r3			
13	r6		r6		r6			r6			
14		s3		s2		s5	s6				12

PILHA	SÍMBOLO	ENTRADA	AGENDA
0		not(+ or f) and f \$	(s3) empilha 3 e avançar
03	not	(+ or f) and f \$	(s2) empilha 2 e avançar
032	not(+ or f) and f \$	(s5) empilha 5 e avançar
0325	not(+	or f) and f \$	(r7) B → true / 2 e B → 11
032[1]	not(B	or f) and f \$	(r4) A → B / 2 e A → 9
0329	not(A	or f) and f \$	(r2) S → A / 2 e S → 10

032[10]	not(S	or f) and f \$	(s4) empilha 4
032[10]4	not(S or	f) and f \$	(s6) empilha 6
032[10]46	not(S or f) and f \$	(r8) B → false / 4 e B → 11
032[10]411	not(S or B) and f \$	(r4) A → B / 4 e A → 3
032[10]48	not(S or A) and f \$	(r1) S → S or A / 2 e S → 10
032[10]	not(S) and f \$	(s13) empilha 13
032[10]13	not(S)	and f \$	(r6) B → (S) / 3 e B → 7
037	notB	and f \$	(r5) B → notB / 0 e B → 11
0/11	B	and f \$	(r4) A → B / 0 e A → 9
09	A	and f \$	(s14) empilha 14
09/14	A and	f \$	(s6) empilha 6
09/14 6	A and f	\$	(r8) B → false / 14 e B → 12
09/14/12	A and B	\$	(r3) A → A and B / 0 e A → 9
09	A	\$	(r2) S → A / 0 e S → 1
01	S	\$	SLR[1,\$]=accept //