

Transformation de grammaires:

①

Exercice 1:

$$S \rightarrow A$$

$$A \rightarrow B + A$$

$$A \rightarrow B$$

$$B \rightarrow A * id$$

$$B \rightarrow id$$

grammaire mutuellement récursive à gauche

Substitutions B dans les règles de A

$$A \rightarrow A * id + A$$

$$A \rightarrow id + A$$

$$A \rightarrow A * id$$

$$A \rightarrow id$$

Éliminons la récursivité à gauche

$$A \rightarrow id + A R$$

$$R \rightarrow * id + A R$$

$$A \rightarrow id F$$

$$R \rightarrow * id F$$

$$A \rightarrow id R$$

$$R \rightarrow * id R$$

$$F \rightarrow + A R$$

$$F \rightarrow \perp$$

$$F \rightarrow R$$

$$R \rightarrow \perp$$

factorisation

$$A \rightarrow id F$$

$$F \rightarrow + A * id F$$

$$F \rightarrow * id F \quad F \rightarrow \perp$$

Exercice 2:

$$N \rightarrow R p C$$

$$N \rightarrow R$$

$$N \rightarrow C$$

$$C \rightarrow iR$$

$$R \rightarrow R C$$

$$R \rightarrow C$$

élimination récursivité à gauche

$$R \rightarrow C S$$

$$S \rightarrow C S \mid \perp$$

Substitution:

(2)

$$N \rightarrow R p C \mid R \mid C$$

$$N \rightarrow c S p C \mid c S \mid i R$$

$$N \rightarrow c (S p C \mid S) \mid i R$$

$$\boxed{N \rightarrow c X \mid i R}$$

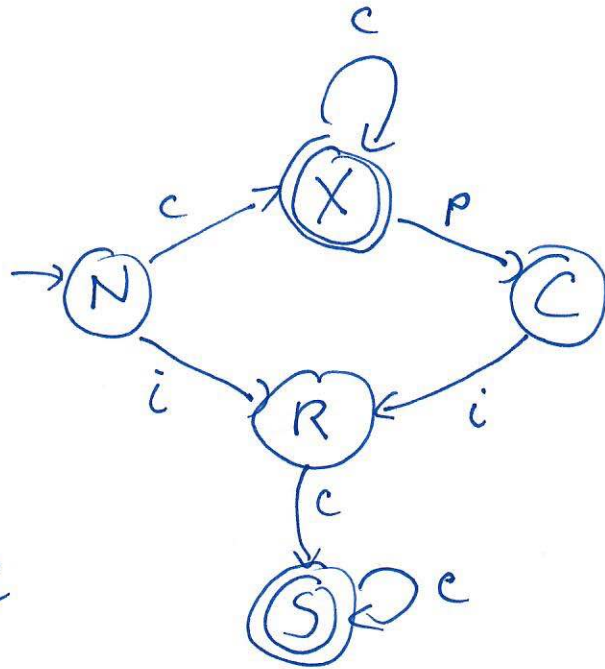
$$X \rightarrow S p C \mid S$$

$$X \rightarrow c S p C \mid c S \mid \Omega \mid p C$$

$$X \rightarrow c (S p C \mid S) \mid \Omega \mid p C$$

$$\boxed{X \rightarrow c X \mid \Omega \mid p C}$$

$$\boxed{\begin{array}{l} C \rightarrow i R \\ R \rightarrow c S \\ S \rightarrow c S \mid \Omega \end{array}}$$



Exercise 3:

$$N_1 \rightarrow N_2 \mid S; N_2 \rightarrow M \mid E_x \mid M E_x \mid \Delta N_2$$

$$\rightarrow E \mid D \mid E D \mid e E_\Delta \mid E E_x \mid D E_x \mid E D E_x \mid \Delta N_2$$

$$N_1 \rightarrow c S \mid \cdot E \mid c S D \mid c E_\Delta \mid c S E_x \mid \cdot E E_x \mid c S D E_x \mid \Delta N_2$$

$$N_1 \rightarrow c (S \mid S D \mid S E_x \mid S D E_x) \mid \cdot (E \mid E E_x) \mid c E_\Delta \mid \Delta N_2$$

$$\boxed{N_1 \rightarrow c X \mid \cdot Y \mid c E_\Delta \mid \Delta N_2}$$

$$X \rightarrow S \mid S D \mid S E_x \mid S D E_x \rightarrow c S \mid c S D \mid c S E_x \mid c S D E_x \mid \Omega \mid D \mid E_x \mid D E_x$$

$$X \rightarrow c S \mid c S D \mid c S E_x \mid c S D E_x \mid \Omega \mid \cdot E \mid c E_\Delta \mid \cdot E E_x$$

$$X \rightarrow c (S \mid S D \mid S E_x \mid S D E_x) \mid \cdot (E \mid E E_x) \mid c E_\Delta$$

$$\boxed{X \rightarrow c X \mid \cdot Y \mid c E_\Delta \mid \Omega}$$

$$Y \rightarrow E \mid E E_a \mid \dots \rightarrow cS \mid cSE_a \rightarrow cZ \quad (3)$$

$$Z \rightarrow S \mid S E_a \rightarrow cS \mid \Lambda \mid cSE_a \mid E_a$$

$$\rightarrow cS \mid \Lambda \mid cSE_a \mid eE_0$$

$$Y \rightarrow cZ$$

$$Z \rightarrow cZ \mid eE_0 \mid \Lambda$$

$$E_0 \rightarrow E \mid \Delta E \rightarrow cS \mid \Delta E$$

$$E_0 \rightarrow cS \mid \Delta E$$

$$E \rightarrow cS$$

$$S \rightarrow cS \mid \Lambda$$

$$N_2 \rightarrow cX \mid \cdot Y \mid eE_0$$

