

Examen 2023

Exercice 1 :

$$L_1 = a^m c^n d^p b^q$$

$$L_2 = a^n c^m d^p b^q$$

1) L_1 est hors contexte, automate à pile

L_2 est régulier \rightarrow automate fini

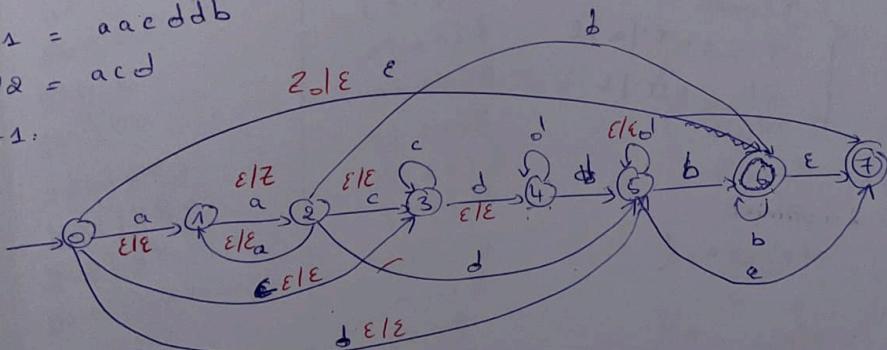
2) $G_1 \left\{ \begin{array}{l} S \rightarrow aSb \mid E \mid \epsilon \\ E \rightarrow cEd \mid dF \\ F \rightarrow dF \mid \epsilon \end{array} \right.$

$G_2 \left\{ \begin{array}{l} S \rightarrow aS \mid E \\ E \rightarrow cE \mid F \\ F \rightarrow dF \mid H \\ H \rightarrow bH \mid \epsilon \end{array} \right.$

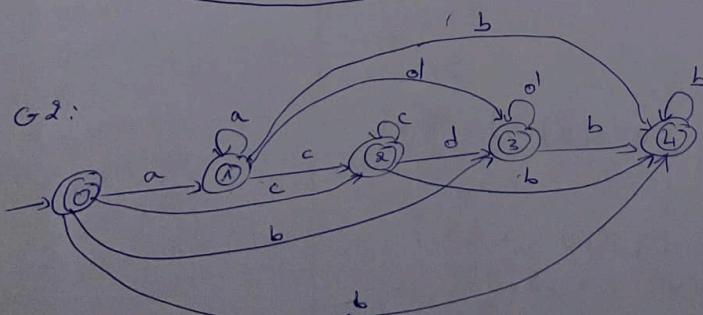
3) $w_1 = aacdddb$

$w_2 = acd$

4) $G_1:$



$G_2:$



Exercice 2.

$$G \left\{ \begin{array}{l} E \rightarrow E a T E | b \\ \quad \quad \quad \alpha \quad \beta \\ T \rightarrow b E T | b | a | \epsilon \end{array} \right.$$

1) $w = babb$

$E \rightarrow E a T E \rightarrow b a T E \rightarrow b a b E \rightarrow babb \rightarrow \text{non accepté}$

2) G n'est pas LL(1) car elle dépend d'une factorisation est recursive à gauche $E \rightarrow E a T E$

$$3) G_2 : \left\{ \begin{array}{l} E \rightarrow b E' \\ E' \rightarrow a T E E' | \epsilon \\ T \rightarrow b E T | b | a | \epsilon \end{array} \right.$$

$$4) G_2 \left\{ \begin{array}{l} E \rightarrow b E' \\ E' \rightarrow a T E E' | \epsilon \\ T \rightarrow b T' | a | \epsilon \\ T' \rightarrow E T | \epsilon \end{array} \right.$$

Exercice 3.

1) Calcul du premier

$$\underline{\varrho}(E) = \underline{\varrho}(F)_{r_E} = n, ($$

$$\underline{\varrho}(H) = *, \epsilon$$

$$\underline{\varrho}(F) = \underline{\varrho}(J)_{r_F} = n, ($$

$$\underline{\varrho}(K) = !, \epsilon$$

$$\underline{\varrho}(J) = n, ($$

* Calcul du suivant

$$S(E) = \$, S(H),) = \$, S(E), ,) = \$, ,)$$

$$S(H) = S(E) = \$, ,)$$

$$S(F) = \underline{\varrho}(H)_{r_F} = *, S(E) = *, \$, ,)$$

$$S(K) = S(F), S(K) = *, \$, ,)$$

$$S(J) = \underline{\varrho}(K)_{r_E} = !, S(F) = !, *, \$, ,)$$

Table d'analyse

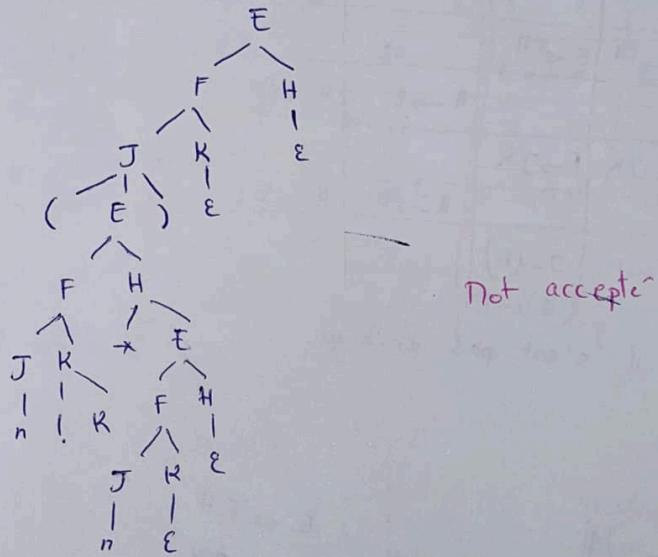
	*	!	n	()	\$
E			$E \rightarrow FH$	$E \rightarrow FH$		
H	$H \rightarrow *E$				$H \rightarrow E$	$H \rightarrow E$
F			$F \rightarrow JK$	$F \rightarrow JK$		
K	$R \rightarrow E$	$R \rightarrow !K$			$R \rightarrow E$	$R \rightarrow E$
J			$J \rightarrow n$	$J \rightarrow (E)$		

n'est pas LL(1) donc, il n'est pas ambigu.

$$5) \quad w = (n! * n)$$

Pile	Entrée	Action
\$E	(n! * n) \$	$E \rightarrow FH$
\$HF	(n! * n) \$	$F \rightarrow JK$
\$HKJ	(n! * n) #	$J \rightarrow (\epsilon)$
\$HK) E ((n! * n) #	depiler (
\$HK) E	n! * n) #	$E \rightarrow FH$
\$HK) HF	n! * n) #	$F \rightarrow JK$
\$HK) HKJ	n! * n) #	$J \rightarrow n$
\$HK) HK^n	n! * n) #	depiler n
\$HK) HR	! * n) #	$R \rightarrow !K$
\$HK) HK!	! * n) #	depiler !
\$HK) HK	* n) #	$R \rightarrow \epsilon$
\$HK) H	* n) #	$H \rightarrow *E$
\$HK) E *	n) #	depiler *
\$HK) E	n) #	$E \rightarrow FH$
\$HK) HF	n) #	$F \rightarrow JK$
\$HK) HKJ	n) #	$J \rightarrow n$
\$HK) HK^n) #	depiler n
\$HK) HK) #	$R \rightarrow \epsilon$
\$HK) H) #	$H \rightarrow \epsilon$
\$HK)) #	depiler)
\$H	\$	$R \rightarrow \epsilon$
		$H \rightarrow \epsilon$
		not accepted

9b) $w = (n! * n)$



Exercice:

$$\begin{aligned} E &\rightarrow FH \mid n \\ H &\rightarrow * E \mid \epsilon \\ F &\rightarrow JK \mid \epsilon \\ K &\rightarrow !K \mid \epsilon \\ J &\rightarrow n \mid (E) \mid E \end{aligned}$$

* Calcul du premier

$$P(E) = P(F)_{\epsilon} \cup n = P(H), n = n, (, P(E)_{\epsilon}, P(H)_{\epsilon}) \mid n = n, (, *, \epsilon, n$$

$$P(H) = *, \epsilon$$

$$P(F) = P(J)_{\epsilon} \cup \epsilon = n, (, P(E)_{\epsilon}) \mid \epsilon = n, (, n, (, *, \epsilon, n, \epsilon$$

$$P(K) = !, \epsilon$$

$$P(J) = n, (, P(E)_{\epsilon}) = n, (, n, (, *, \epsilon, n$$

Calcul du suivant:

$$S(E) = \$, S(H) = \$, S(J) = \$, S(F) = !, *, S(K) = !, *,$$

$$S(H) = S(E) = \$, !, *$$

$$S(F) = P(H)_{\epsilon} = *, S(E) = *, \$, !, *,$$

$$S(K) = S(F) = *, S(E) = *, \$, !, *,$$

$$S(J) = P(K)_{\epsilon} = !, S(F) = !, *, S(E)$$

$$= !, *, \$, !, *,$$

Table d'analyse

	n	*	!	()	\$
E	$E \rightarrow n$ $E \rightarrow F H$	$E \rightarrow F H$	$E \rightarrow F H$	$E \rightarrow F H$	$E \rightarrow F H$	$E \rightarrow F H$
H	$H \rightarrow E$	$H \rightarrow \epsilon$	$H \rightarrow \epsilon$	+	$H \rightarrow \epsilon$	$H \rightarrow \epsilon$
F	$F \rightarrow J K$	$F \rightarrow J K$ $F \rightarrow \epsilon$	$F \rightarrow \epsilon$	$F \rightarrow J K$	$F \rightarrow \epsilon$	$F \rightarrow \epsilon$
K		$K \rightarrow \epsilon$	$K \rightarrow ! K \epsilon$ $K \rightarrow \epsilon$		$K \rightarrow \epsilon$	$K \rightarrow \epsilon$
J	$J \rightarrow n$ $J \rightarrow \epsilon$	$J \rightarrow E$	$J \rightarrow E$	$J \rightarrow (E)$		