

Exercice 1 :

$G = \{S, \{a, b, c\}, S, R\}$

$R: S \rightarrow aSa$

$S \rightarrow cSc \mid a$

$S \rightarrow bSb$

1) ababa

$S \rightarrow aSa \rightarrow abSba \rightarrow ababa$: accepté

Cbbaaabbc

$S \rightarrow cSc \rightarrow cbSbc \rightarrow cbbSbbc \rightarrow cbbaSabbcc \rightarrow cbbaaabbc$: accepté

Abba

$S \rightarrow aSa \rightarrow abSba$: non accepté

Acbabca

$S \rightarrow aSa \rightarrow acSca \rightarrow acbSbca \rightarrow acbabca$: accepté

2) $L = \{u \in \epsilon^* \mid u = waw^R, w \in \epsilon^*\}$

Exercice 2:

1) $L1 = \{a^n b^n \mid n > 0\}$

$G = \{S, \{a, b\}, S, R\}$

$R: S \rightarrow aSb$

$S \rightarrow ab$

2) $L1 = \{a^n b^{2n} \mid n > 0\}$

$G = \{S, \{a, b\}, S, R\}$

$R: S \rightarrow aSbb$

$S \rightarrow \epsilon$

3) $G = \{S, \{a, b\}, S, R\}$

$S \rightarrow aSa \mid bSb \mid a \mid b \mid \epsilon$

4) $G = \{\{S, B\}, \{a, b, c\}, S, R\}$

$S \rightarrow aSc \mid aBc$

$B \rightarrow bB \mid \epsilon$

5) $G = \{\{S, B\}, \{a, b, c\}, S, R\}$

$S \rightarrow aSc \mid bBc \mid \epsilon$

$B \rightarrow bBc \mid \epsilon$

Exercice 3:

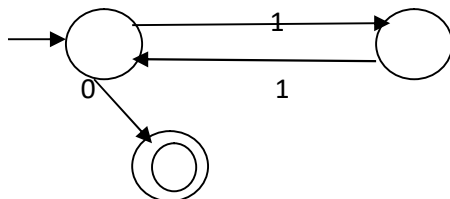
$G = \{S, \{0, 1\}, S, R\}$

R: $S \rightarrow 11S$

$S \rightarrow 0$

1) Le langage commence par 11 et se termine par 0. Ou bien c'est 0

2)

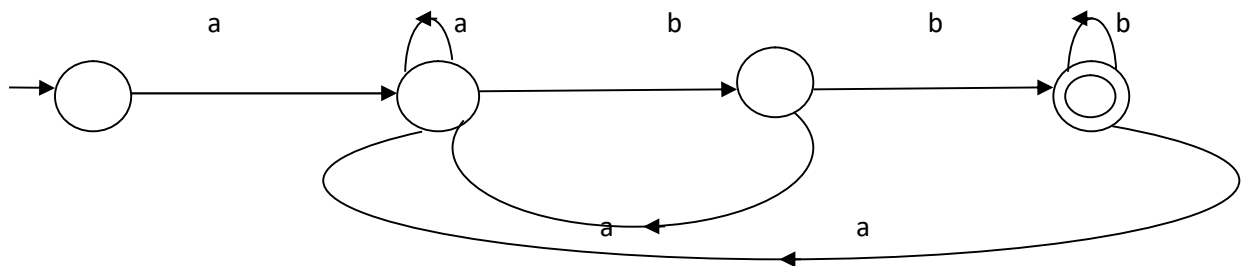


3) ER : $(11)^*0$

Exercice 4 :

1) $a(a|b)^*bb$

2)



3) $G = \{ \{M, S\}, \{a, b\}, S, R \}$

$R : S \rightarrow aMbb$

$M \rightarrow aM | bM | \epsilon$

Exercice 5 :

- G1 :

$S \rightarrow AA | ab | aab$

$A \rightarrow ba | ab | \epsilon$

- G2:

$S \rightarrow UG$

$U \rightarrow uU | \epsilon$

$G \rightarrow xG | x$

1) $A \rightarrow ba | ab | \epsilon$

G1 et G2 hors contexte.

2) $L(G1) = \{ \epsilon, ab, aab, baba, abab, baab \}$

$L(G2) = \{ x, Ux, UUX, \dots \}$

ER = U^*x^+

3) G3 qui génère $L(G1)$ et $L(G2)$

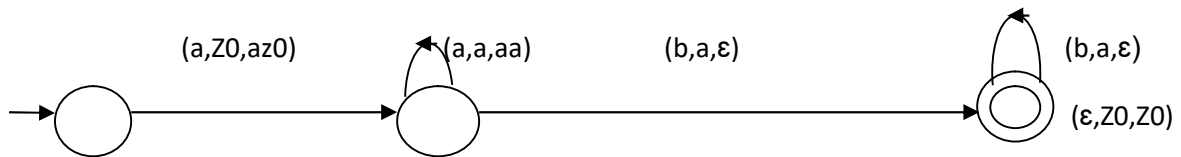
G3 :

$S' \rightarrow AA \mid ab \mid aab \mid UG$
 $A \rightarrow ba \mid ab \mid \epsilon$
 $U \rightarrow uU \mid \epsilon$
 $G \rightarrow xG \mid x$

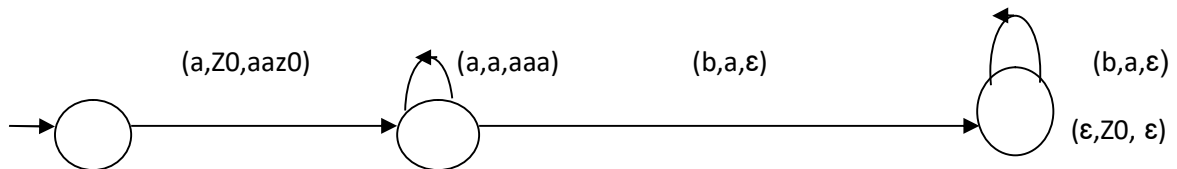
$G3 = \{\{S', A, U, G\}, \{a, b, u, x\}, S', R\}$

Exercise 7

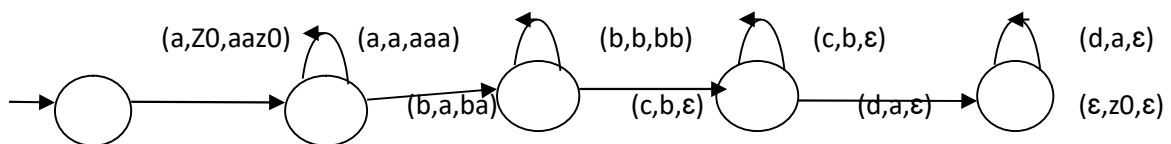
1) $L1 = \{a^n b^n, n \geq 0\}$



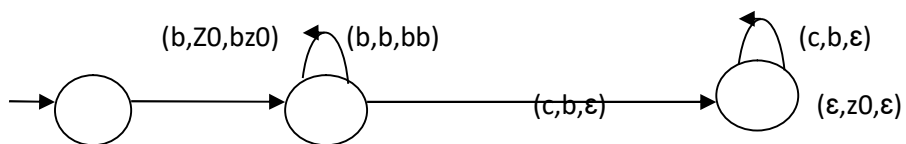
2) $L2 = \{a^n b^{2n}, n \geq 0\}$



3) $L3 = \{a^n b^m c^m d^{2n}, n \geq 0, m \geq 0\}$



Si $n=0$



Si $m=0$

