

Exemples d'expressions régulières:

alphabet $\{a, b\}$

• $aab, (a+bb)$ le lang. $\{aaba, aabbb\}$

• le lang. des mots qui commencent et terminent par la même lettre

$$a + b + a(a+b)^*a + b(a+b)^*b$$

$(a+b)^*$ tous les mots

$$= \epsilon + (a+b) + \underbrace{(a+b)^2}_{(a+b)(a+b)} + (a+b)^3 + \dots$$

$$= (a+b)(a+b)$$

$$= (aa + ab + ba + bb)$$

• mots de 3 lettres avec un b en seconde lettre

$$(a+b)b(a+b)$$

• mots de longueur paire (lang. $\{0, 2, 4, \dots\}$)

Exp. reg. Utilise les symboles:

- a et b

- $+$

- \cdot

- $*$

- parenthèses.

$$\left((a+b)(a+b) \right)^*$$

$$= (aa + ab + ba + bb)^*$$

le lang. des mots qui commencent et terminent par une lettre différente.

? mot vide ϵ ? (sur. $\epsilon \notin \text{lang.}$)

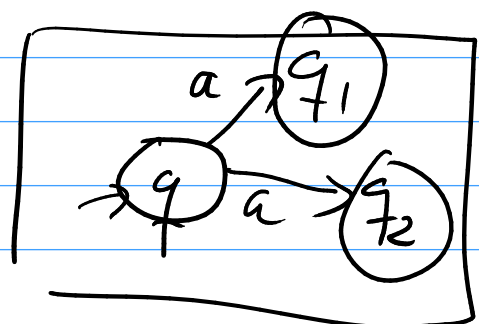
$$\boxed{a(a+b)^*b + b(a+b)^*a}$$

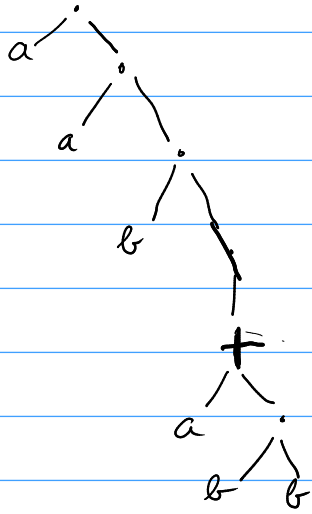
Si alphabet $\{a, b, c\}$

$$\begin{aligned} & a(a+b+c)^*b \\ + & a(a+b+c)^*c \\ + & b(a+b+c)^*a \\ + & b(a+b+c)^*c \\ + & c(a+b+c)^*a \\ + & c(a+b+c)^*b \end{aligned}$$

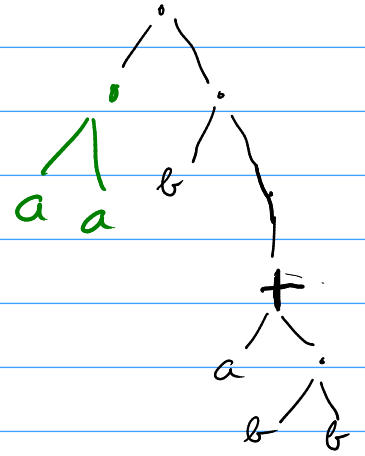
Sur un exemple, comment passer d'une exp. reg. à un automate fini (non-déterministe)?

exemple



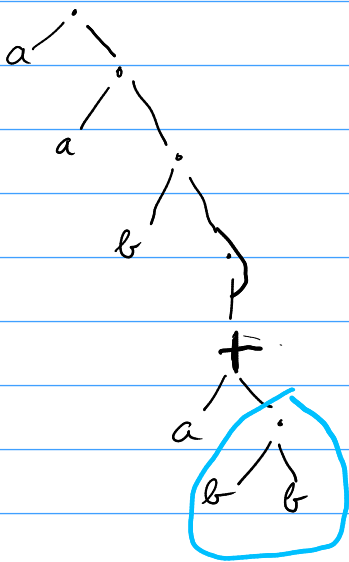


$(a.a)b, (a+bb)$

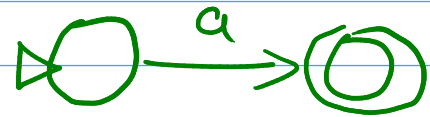


associativité

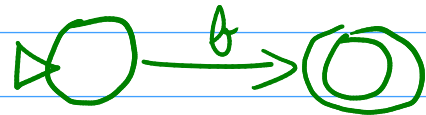
$$(x.y).z = x.(y.z) = x.y.z$$



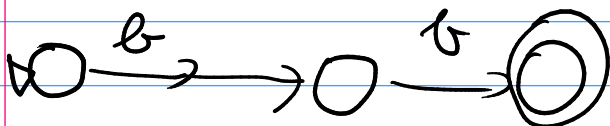
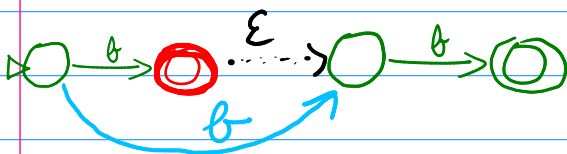
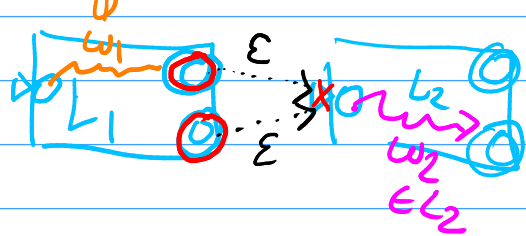
lettre a

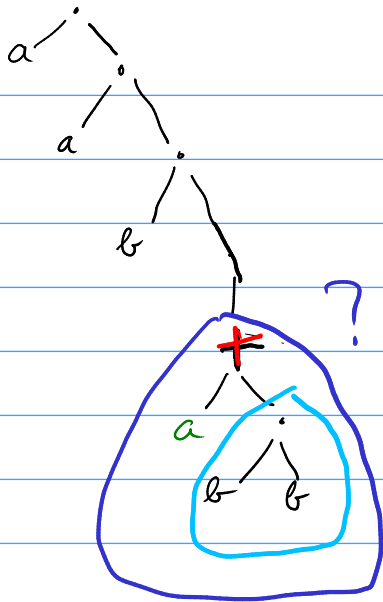


lettre b

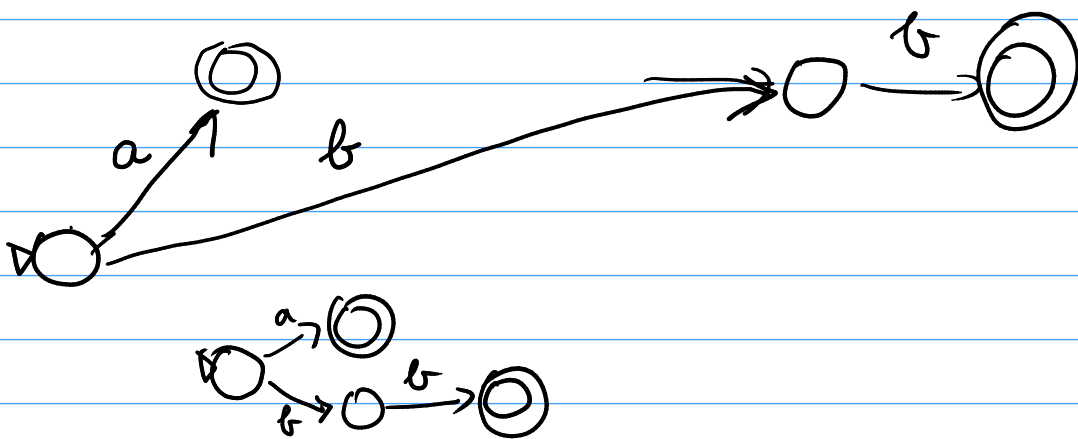
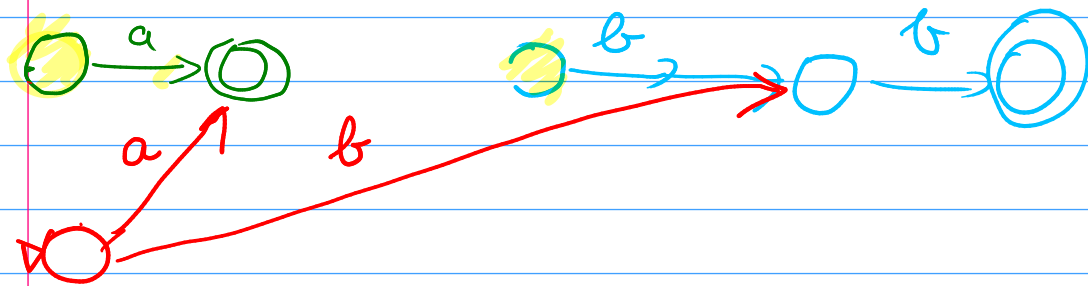
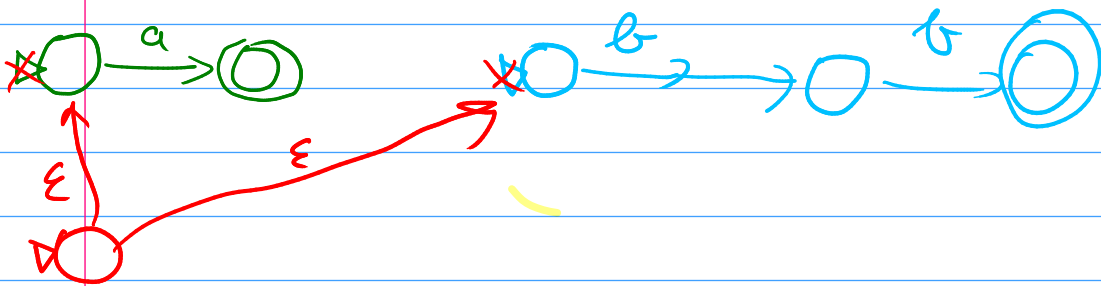
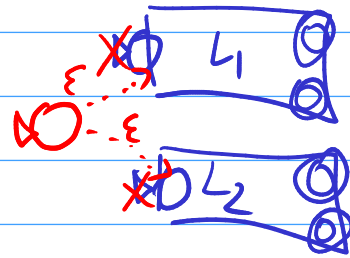


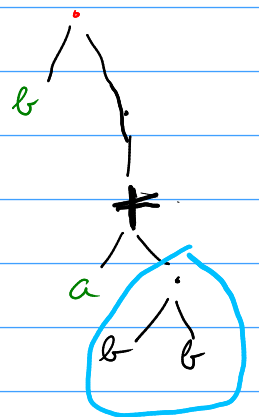
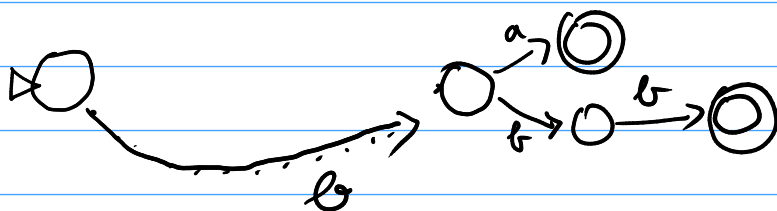
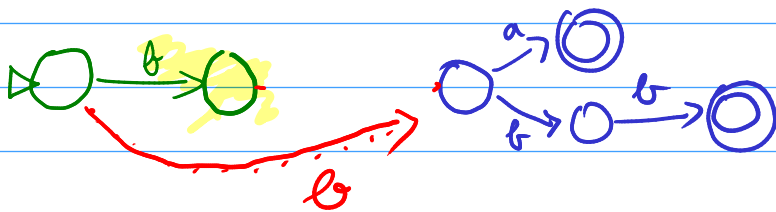
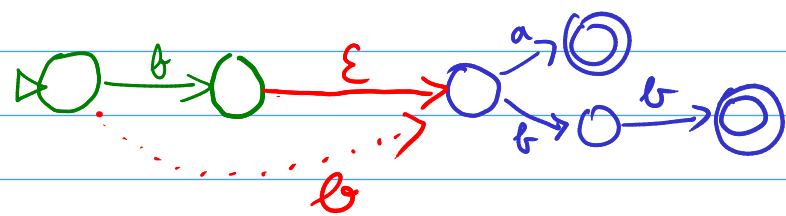
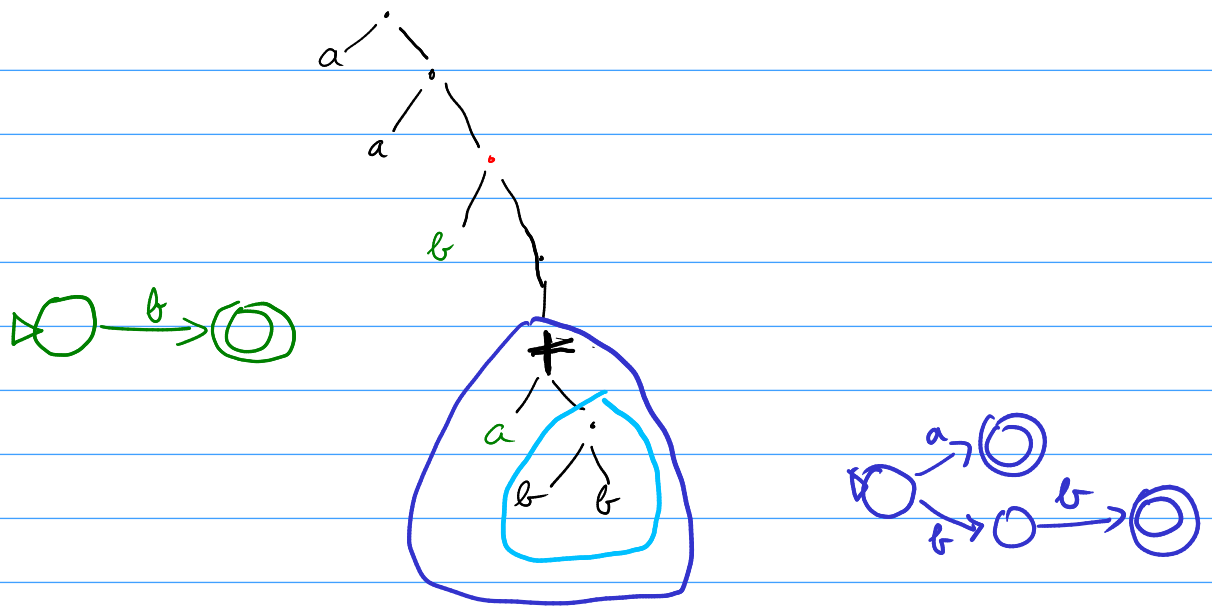
$L_1 \cdot L_2$

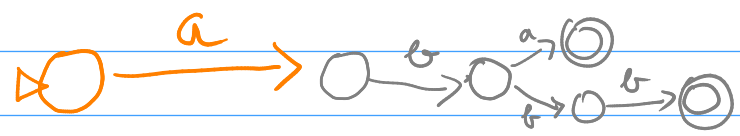
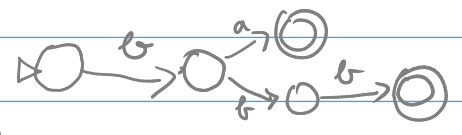
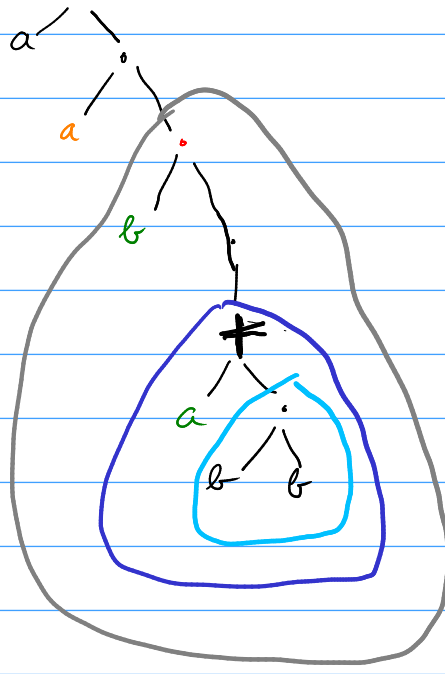
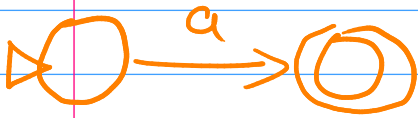


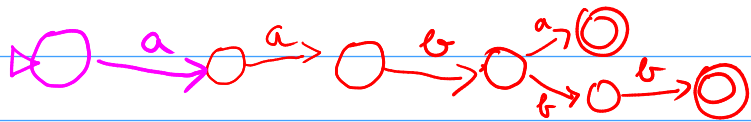
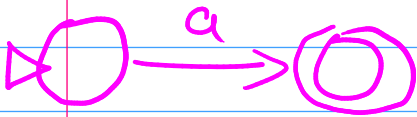
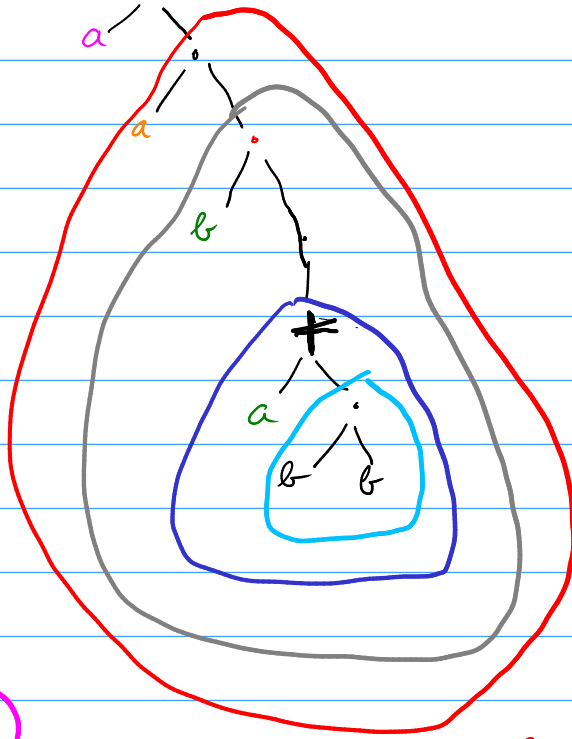


$L_1 + L_2$



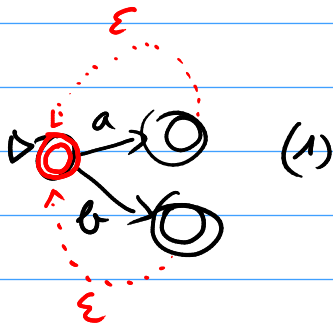
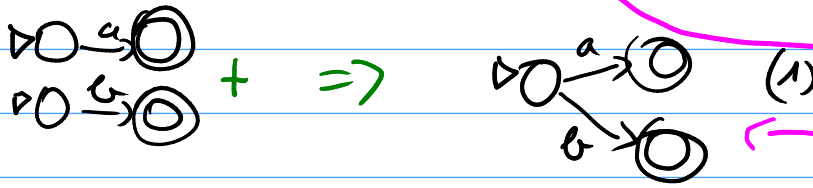
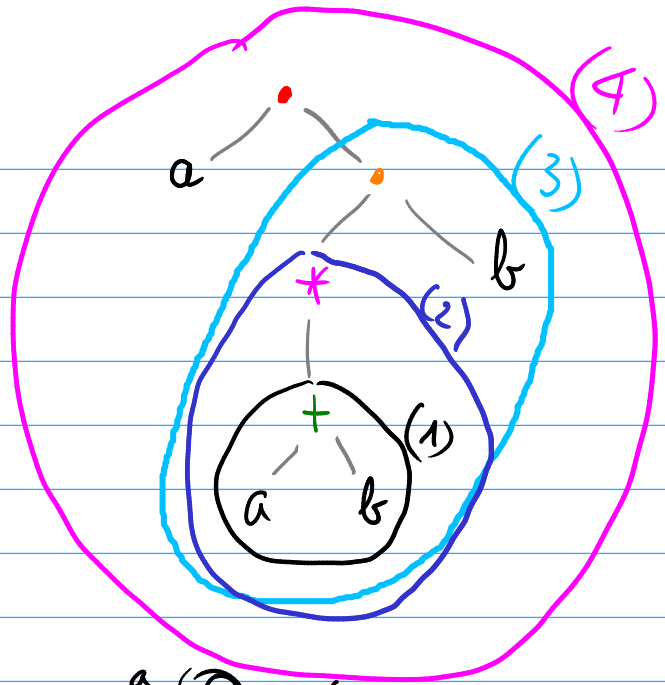






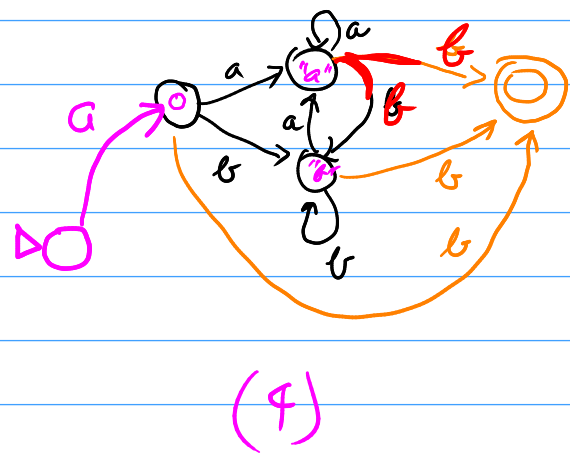
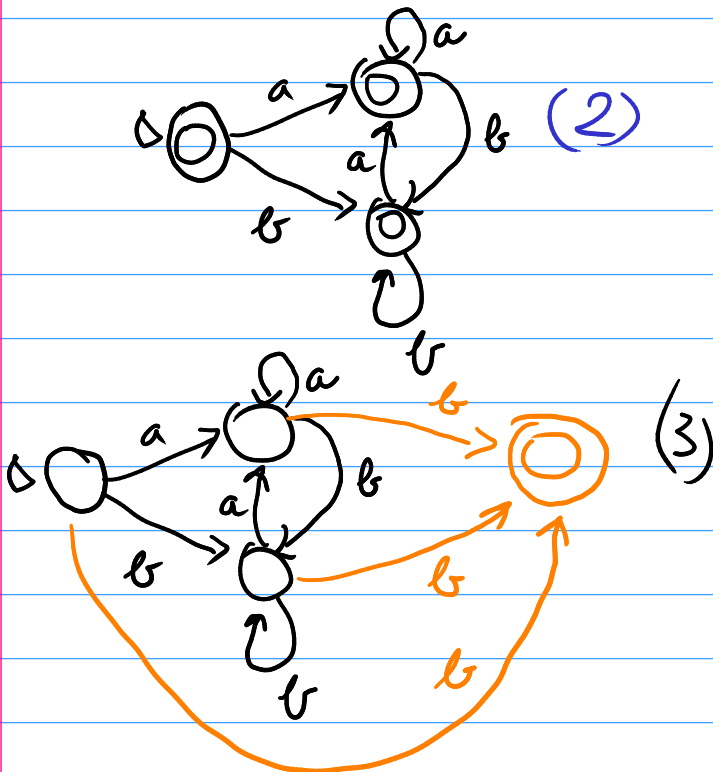
terminé. uf.

$a \cdot (a + b)^* \cdot b$



* : 0 ou plusieurs fois en mot du lex. reconu par

$\epsilon + L + LL + LLL + \dots$



Deux exercices possibles sur cette séquence

**1) J'exprime un langage (en français, sous forme d'ensemble de mots, ...)
je demande une regexp**

2) a) Je donne une regexp et je demande un arbre

b) je donne un arbre et je demande la construction de l'automate.

grep.

Voir video pour exemples en action

les jeux

<https://www.wordply.com/>

wordply

spelling bee

https://www.nytimes.com/puzzles/spelling-bee?utm_source=wordle&utm_medium=referral&utm_campaign=wordle_nav

<https://www.nytimes.com/games/wordle/index.html>

wordle

- 1937 grep the american-english | more
- 1938 grep the american-english
- 1939 grep ^the american-english
- 1940 grep the\$ american-english
- 1941 grep her american-english
- 1942 grep cow american-english
- 1943 ls
- 1944 head answers.txt
- 1945 tail answers.txt
- 1946 tail wordle-allowed-guesses.txt
- 1947 egrep [^st] answers.txt
- 1948 egrep [^st] american-english
- 1949 egrep [^st]5 american-english
- 1950 egrep [^st]^5 american-english
- 1951 egrep [^st]*5 american-english
- 1952 egrep ([^st])5 american-english
- 1953 egrep ^[^st][^st][^st][^st]\$ american-english
- 1954 egrep ^[^st][^st][^st][^st]\$ american-english
- 1955 egrep ^[abcdefghijklmnopqr uvwxyz][abcdefghijklmnopqr uvwxyz][abcdefghijklmnopqr uvwxyz][abcdefghijklmnopqr uvwxyz]
- 1956 egrep ^[^st][^st][^st][^st]* answers.txt
- 1957 egrep ^[^st][^st][^st][^st]\$ answers.txt
- 1958 egrep ^[^st][^st][^st][^st]* answers.txt
- 1959 egrep ^[^st][^st][^st][^st]\$ answers.txt
- 1960 egrep ^[^st][^st][^st][^st]\$ answers.txt | wc -l
- 1961 wc -l answers.txt
- 1962 egrep ^[^st][^st][^sta][^str][^ste]\$ answers.txt | wc -l
- 1963 egrep ^[^st][^st][^sta][^str][^ste]\$ answers.txt
- 1964 egrep ^[^st][^st][^sta][^str][^ste]\$ answers.txt | grep a
- 1965 egrep ^[^st][^st][^sta][^str][^ste]\$ answers.txt | grep a | grep r
- 1966 egrep ^[^st][^st][^sta][^str][^ste]\$ answers.txt | grep a | wc -l
- 1967 egrep ^[^st][^st][^sta][^str][^ste]\$ answers.txt | grep a | grep r | wc -l
- 1968 egrep ^[^st][^st][^sta][^str][^ste]\$ answers.txt | grep a | grep r | grep e | wc -l
- 1969 egrep ^[^st][^st][^sta][^str][^ste]\$ answers.txt | grep a | grep r | grep e
- 1970 egrep ^[^str]a[^star]er\$ answers.txt
- 1971 egrep ^[^str]a[^star]er\$ answers.txt
- 1972 egrep ^[^str]cmk[^star]cmk\$ answers.txt
- 1973 egrep ^[^str]cmkp[^star]cmkp\$ answers.txt
- 1974 egrep [violent]* american-english
- 1975 egrep ^[violent]*\$ american-english
- 1976 egrep ^[violent]*\$ american-english | grep v
- 1977 egrep ^[violent][violent][violent][violent][violent]*\$ american-english | grep v
- 1978 alias
- 1979 grep ^[violent][violent][violent][violent][violent]*\$ american-english | grep v

**Mots qui commencent et terminent par la même lettre?
avec grep?**

grep ^a[a-z]*a\$ lefichier
etc pour ^b...b\$... ^z...z\$

soit on peut donner un nom à une sous-expression

Ici avec des parenthèses

(...) ... \1

Exemple :

egrep '^([a-z])[a-z]*\1\$' american-english
première et dernière lettre identique

Autre exemple. Mots qui répètent deux mots (comme yoyo ou tartar)
egrep '^([a-z]*)\1\$' american-english