

Practical Series N°3

Exercise 1 (pumping lemma)

We aim by this exercise, to practice the pumping lemma which is used to prove that a given language is not a regular language; the content of this lemma is:

Pumping lemma *If A is a regular language, then there is a number p (the pumping length) where if s is any string in A of length at least p , then s may be divided into three pieces, $s = xyz$, satisfying the following conditions:*

1. $\forall i \geq 0, xy^iz \in A,$
2. $|y| > 0,$ and
3. $|xy| \leq p.$

In other words, any sufficiently long string in L can be broken down into three parts such that any number of repetitions (concatenation) of the middle part (pumping the middle part) will still yield in a string in L .

Exercise2 (Regular expressions)

Create the following regular expression, using Jflap tool, then convert each one into finite automaton (NFA):

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