THEORY OF AUTOMATA

&

FORMAL LANGUAGES

HANDOUTS 07

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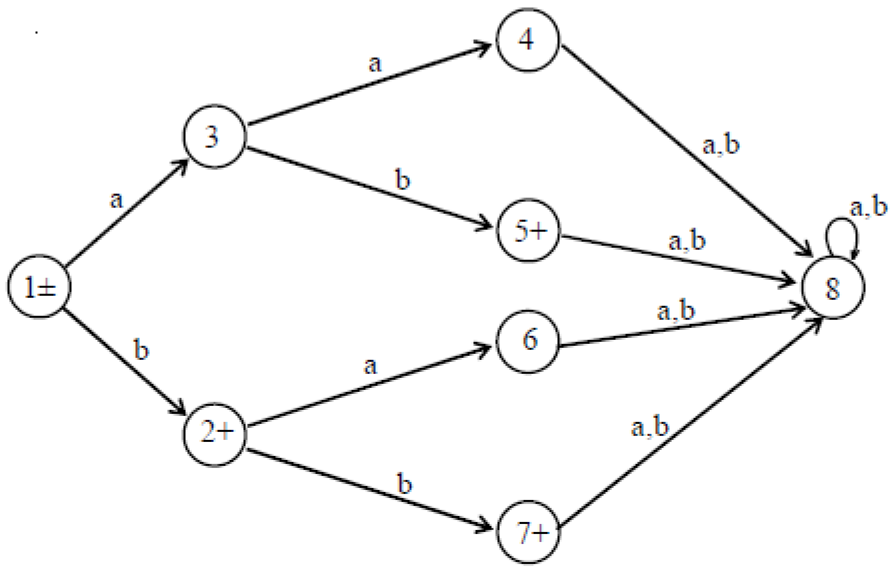
FA tree structure
&
FA structure proposed by J.Martin

It is to be noted that to build an FA accepting the language having less number of strings, the tree structure may also help in this regard, which can be observed in the following transition diagram for the

Language L, discussed in the above example



Example

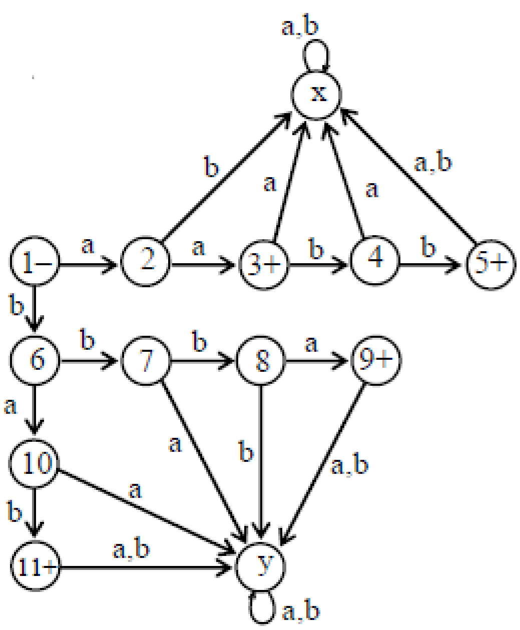
Consider the language

L = {aa, bab, aabb, bbba}, defined over Σ ={a, b}, expressed by aa + bab + aabb + bbba

OR

aa (Λ + bb) + b (ab + bba)

The above language may be accepted by the FA as shown below

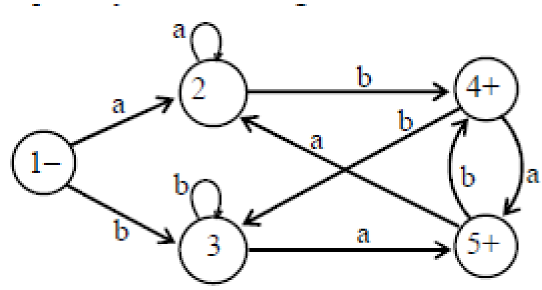


Example

Consider the language L = {w belongs to {a,b}*: length(w) ≥2 and w neither ends in **aa** nor **bb**}.

The language L may be expressed by the regular expression (a+b)*(ab+ba)

This language may be accepted by the following FA



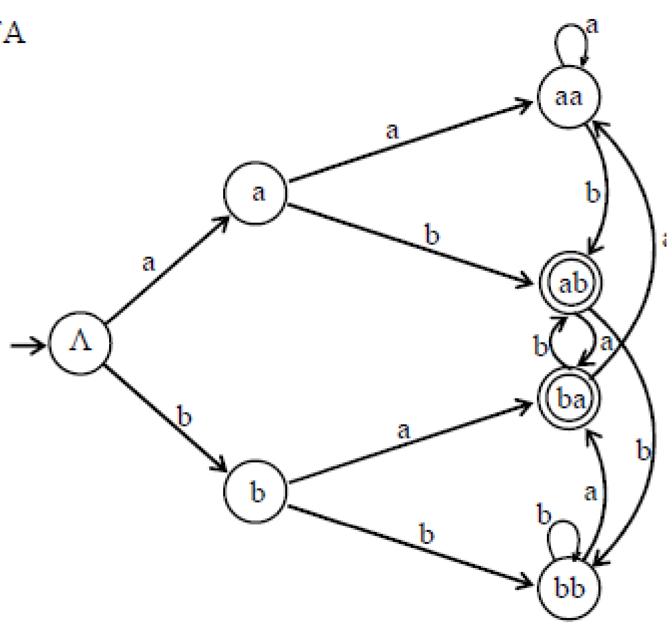
Note

It is to be noted that building an FA corresponding to the language L, discussed in the above example, seems to be quite difficult, but the same can be done using tree structure along with the technique discussed in the book

Introduction to Languages and Theory of Computation, by J. C. Martin

so that the strings ending in aa, ab, ba and bb should end in the states labeled as aa, ab, ba and bb, respectively; as shown in the following

FA



Example

Consider the language FA corresponding to r1+r2 can be determined as

L = {w belongs to {a,b}*: w does not end in **aa**}.

The language L may be expressed by the regular expression Λ + a + b + (a+b)*(ab+ba+bb). This language may be accepted by the following FA