

OcamlLex - Lexical Analyser

Condensed representation

Intro

We will study the condensed representation of a suite of positive numbers. In principle condensing is expressing each element of the suite by its gap to a reference value, named “base”. For instance, the following suite:

S: 149 147 147 151 151 151 150 150 162 162 143 143

can be condensed referring to 150 as a base:

150-1 150-3 150-3 150+1 150 +1 150+1 150 150 150+12 150+12 150-7 150-7

The condensed representation states first the base then the gaps. Base is separated from gaps by \$. And when there are n consecutive occurrences of a same element in the suite, the representation is:

- for element different of the base: n times + (resp. -) followed by a white gap.

Examples:

base is 150 and “b” symbolizes white gap, then “151 151 151” becomes “+++1b”, “147 147” becomes “--3b”...

- for element equals to the base: n times 0 followed by a white gap.

Example: base is 150 and “b” symbolizes white gap, then “150 150” becomes ”00b”

The condensed notation CS of S is thus:

CS: 150\$-1b--3b+++1b00b++12b--7b

• Find the alphabet and the regular expression

The alphabet is:

0 1 2 3 4 5 6 7 8 9 \$ + -

The regular expression is:

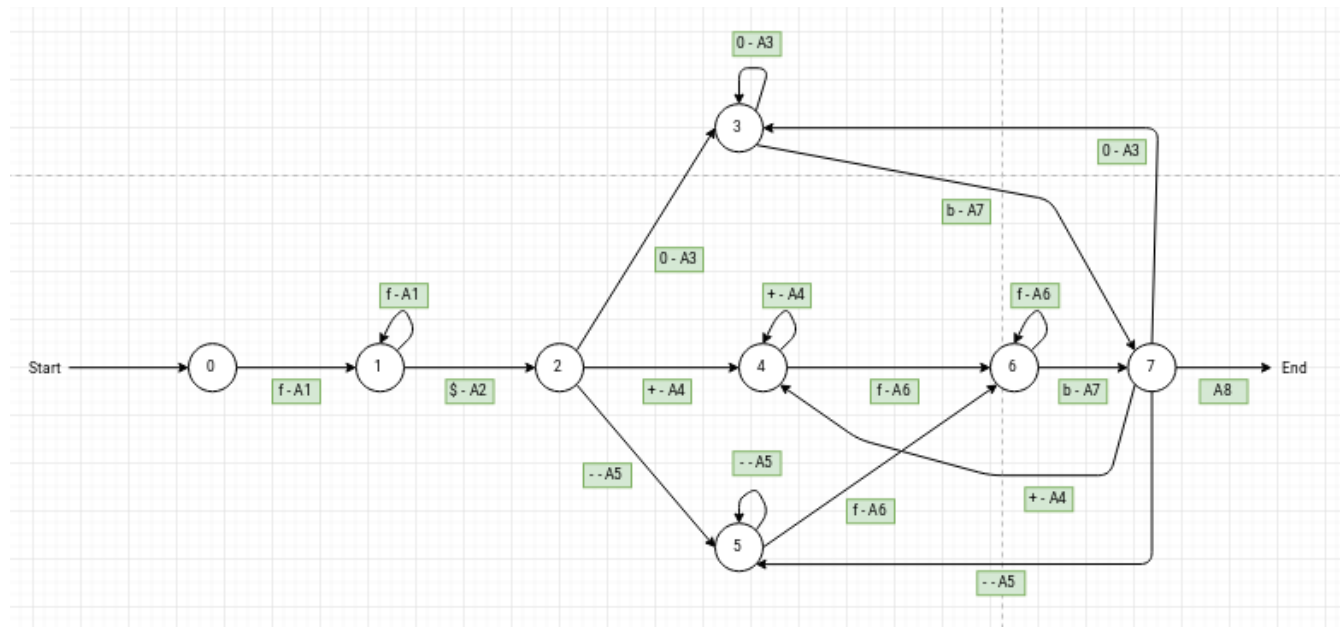
$$L = (0-9)^+ \$ [(+ -)^+ (0-9)^+][0^+] b$$

• Find a deterministic automaton

If:

$f = 0..9$

Then the deterministic automaton is:



• Find the semantic actions

The semantic actions are:

A1: $\text{base} = \text{int}(\text{symbol})$, if base is not null then $\text{base} = \text{base} * 10 + \text{int}(\text{symbol})$

A2: detect separator '\$'

A3: $\text{operator} = 0$ and increment nb_operator

A4: $\text{operator} = +$ and increment nb_operator

A5: $\text{operator} = -$ and increment nb_operator

A6: $\text{shift} = \text{int}(\text{symbol})$, if shift is not null then $\text{shift} = \text{shift} * 10 + \text{int}(\text{symbol})$

A7: for each integer in nb_operator , if $\text{operator} = 0$ print(base) else print the result of (base operator shift)

A8: exit the program

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- **Program the semantic actions.**

See the files linked