

DatZ 1037 – Practical Assignment 1
Autumn 2019
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prepared: September 10, 2019

*Due date is **Monday, September 30, 2019***

Please send your program including the source code by e-mail to ‘abuzer@lu.lv’

Each program will be tested during the class on Tuesday, October 1, 2019

You can work as a group of two people.

Task: Write a computer program that takes

- *the description of a unary deterministic finite automaton and*
- *a list of unary strings,*

and then

- outputs the decision of the automaton on each input.

Details:

1) You can use *C++* or *Javascript with HTML*.

If you use *Javascript with HTML*, then the input of your program are received from the text boxes on the HTML file (copy-paste from the text file).

The output of your program can be written on a text file or written on the screen (console or visual environment).

2) The description of an automaton will be in the following format:

$$m\#A\#T,$$

where

- m is the number of states and it is always assumed that the states are labelled as s_1, s_2, \dots, s_m and s_1 is the starting state;
- A is the list of the accepting state(s), e.g., s_3 or s_5, s_7, s_{13} ; and,
- T is the list of transitions rules, e.g., $s_1 \rightarrow s_3, s_2 \rightarrow s_7, \dots, s_m \rightarrow s_2$.

For example, the description of automaton recognizing language $\text{MOD}_4 = \{a^{4j} \mid j \in \mathbb{N}\}$ is

$$4\#s_1\#s_1 \rightarrow s_2, s_2 \rightarrow s_3, s_3 \rightarrow s_4, s_4 \rightarrow s_1$$

and the description of automaton recognizing language $\{aa, aaa\}$ is

5#s3,s4#s1->s2,s2->s3,s3->s4,s4->s5,s5->s5

3) The description of an automaton and the list of unary strings are given as a text file. An example content of such text file is as follows:

4#s1#s1->s2,s2->s3,s3->s4,s4->s1

aa

aaaaaaaa

a

aaaa

aaaaa

4) Your program should execute the given automaton on each given string, and then gives the decision of the automaton on the string. For example, the output of your program for the above given text file should be as follows:

aa is REJECTED

aaaaaaaa is ACCEPTED

a is REJECTED

aaaa is ACCEPTED

aaaaa is REJECTED