Assignment 1

Automata Theory

[Deadline: 19 August, 2019 11:55PM]

Your task is to write a python script to convert a Nondeterministic finite automaton to a deterministic finite automaton. Your script should read input.json file containing an object which represents a NFA. This json object will have 5 key-value pairs corresponding to the 5-tuple used to represent the NFA. A sample is shown below for input.json:

```
{
  "states" : 8,
  "letters" : ["a","b","c"],
  "t_func" : [[1,"a",[1,3,0]]],
  "start" : 0,
  "final" : [4]
}
```

states : Number of states. Assume the states are numbered 0,1,2....n-1 for n states.
letters: Alphabet used by the NFA
t_func: The transition function for the NFA. Each transition is an array of 3 elements: original state, input and the new state.
start: The index of the starting state
final: List of accepted states

Your script should parse this json and convert it to a DFA object which will be written to a json file output.json. The format of output.json should be exactly like input.json. If your input NFA has n states, the output DFA should have 2^n states indexed 0,1,2.....2^n-1.

You are also supposed to write a report explaining your code. Include snip-

pets from your code in this report and briefly describe their function. This report will be a part of the manual evaluation done by the TAs.

Include script.py and report.pdf in a directory <Roll_no>_A1 and compress it to <Roll_no>_A1.tar.gz for submission. **Plagiarism will lead to serious penalties.**

All the best!!