Research Proposal

Created by Matthew Kennedy

Table of Contents

About the project

The semester project will be focused on expanding the first programming assignment. The task of the assignment was to create a program that could convert a given NFA or NFA-ƛ into a DFA. With this project, we will take a created DFA, and create the minimum-state DFA equivalent. Additionally, the project will include a GUI to simplify the process of supplying an initial automaton.

Project Goals

This project will have several goals. The four main goals are,

1. Convert an NFA or NFA-ƛ into a minimized-state DFA
2. Create an adequate user interface to simplify the use of this program
3. Provide a way to test input strings on this newly created minimized-state DFA
4. Output the minimized-state DFA in a graphviz suitable output to visualize the new automata.

UI/UX Design

The UI will be focused around giving the user an easier way to input the initial NFA or NFA-ƛ, using either manual input, or input from a file. The UI will provide a help section to identify any necessary formatting the user will need to use for input. Additionally, the UI will provide an interface to test strings provided by the user against the newly created minimized-state DFA

Project Stages

The project will develop through the following stages:

1. Preliminary UI design
2. Input preprocessing
3. Integration with prior assignment work (convert NFA/ƛ into DFA)
4. Create algorithm to convert new DFA into minimized-state DFA
5. Provide simulator through UI to test the new minimized-state DFA

References

-Minimization handout provided by Professor de Doncker

-Python - https://www.python.org/

-PyQT - https://wiki.python.org/moin/PyQt

-Python testing - https://docs.python.org/3/library/unittest.html