CSCI 3236 Theoretical Functions

Project description
Due date: April 20 (Tuesday) at 8:00am

Purpose: To model a DFA (Deterministic Finite Automaton) and use it to accept strings of the associated language.

Input: The program should take the DFA description from a text file that is specified as a command line parameter. If this parameter is missing, the user should be prompted for the data file. Strings to be tested for inclusion in the language should be entered interactively by the user.

Output: For each string being tested, the program should indicate whether or not the string is accepted.

DFA input format:

line 1: alphabet -	eg. {0,1}
line 2: states -	eg. {a,b,c,d,e}
line 3: start state -	eg. a
line 4: accept states -	eg. {d,e}
lines 5-: transition fn -	eg. (a,0)->b (a,1)->c etc.

Notes:

- Assume no spaces in input.
- Alphabet must at least allow {0,1}. Please feel free to expand this.
- States must at least allow letters, but you are welcome to expand this.
- Transition functions may appear in any order in the input text file. End of the input file indicates the end of transition functions.
- You can team up with other students in class or do this project individually. Full participation of each member in a team is expected.
- The sample DFA-Test.txt file is given in folio to describe the DFA in Example 2 of the chapter5 slides, page 13. It is a DFA that recognizes the regular language over {0, 1} that contain the substring 001. You can use this as your first sample test file. **But you are required to submit a different DFA and make sure that your own DFA input file fits the format in the project description.**

Project presentations will be scheduled on April 20, 22 and 27. Each team member is expected to participate. Please see the next page for detailed expectations regarding project presentations.

What to submit

1) all source code files
2) a sample DFA text file of your own
3) PowerPoint slides of your presentation that
   - gives an overall project description;
   - shows your own DFA sample file (different from the DFA input sample from me), illustrate the state diagram of your DFA, and explain the regular language that your DFA is supposed to accept;
   - includes screenshots of the execution results to show least one string to be accepted and at least one string to be rejected.
     - You must have screenshots that demonstrate your program execution that is based on the different DFA input than the sample.

Project presentations

Project presentations will be scheduled on April 20, 22 and 27 in Zoom. Each team member is expected to participate. Each team is expected to have a short PowerPoint presentation and demonstrate your implementation of the project. During the demo, you are expected to show a **different** DFA than the sample that I gave and accomplish the following tasks:

1. show the state diagram of your DFA,
2. explain the regular language that your DFA is supposed to accept, and
3. input at least one string that should be accepted and at least one string that should be rejected.

How to hand in the Project

When you have finished your project, you will upload (submit) it to the same dropbox folder where you found it. I remind you that if you do not submit the project before the due date, you will not be able to submit it.

1. Return to the dropbox folder for this project.
2. Look for the "Add a File" button in the Submit Files area.
3. Browse for all the project files that you have on your computer and select them so that they upload to the assignment area.
4. Each group only need to submit one set of files.
5. Click "Submit".