CSCI 3236 Theoretical Functions

Project description
Due date: April 25 at 11:00am

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 lower case letters, but you are welcome to expand this to numerals and upper case letters.
- Transition functions may appear in any order in the input text file. End of the input file indicates the end of transition functions.
- Name the source code file Dfa.java.
- You are encouraged to team up with other students in class for the project with no more than 5 students per team. 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-part2 slides, page 5. It is a DFA that recognizes the regular language over {0, 1} that contain the substring 001. You can use 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.**

When your team has finished the project, you will upload (submit) it to the "Project" dropbox folder in folio. I remind you that if you do not submit the project before the due date, you will not be able to submit it.

1. Complete the assignment including the following contents: 1) the source code file, 2) a sample DFA text file, 3) screenshots of your result, 4) a README file to discuss the details of your program, 5) PowerPoint slides of your team presentation.
2. Return to the dropbox folder for this project.
3. Look for the "Add a File" button in the Submit Files area.
4. Browse for the project files that you have on your computer, and select them so that they upload to the assignment area.
5. Each group only need to submit one set of files.
6. Click "Submit".

Project presentations will be scheduled during the last two classes of the semester, April 30 and May 2. 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.