CSCI 431 Project 2

Create software that takes 3 command-line arguments: the first is the name of an FSA input file, the second is the name of an FSA output file, and the third is a file containing descriptions of changes made (an action report file).

The first two files are formatted in the same way as the FSA description file in project 1 was formatted.

The last file contains information of actions taken in minimizing the machine. Each action description should be separated from other action descriptions adjacent to it by at least one blank line.

The types of actions reported are:

1. States removed because they are unreachable from the start state. Each of these is a separate action. Each desciption should include the number (table index) of the state removed.
2. States combined. Each of these is a separate action. Each description should include the numbers of the states combined and the number of the remaining stated.
3. States who have their number changed. Each of these is a separate action. Each description should give the initial number of the state and the number it is changed to.

The program reads in the file whose name is the first command-line argument. It outputs an FSA definition file that is the reduced machine. Then name of this file is the second command-line argument. The action report file is also output. Its name is the third command-line argument.

As a way of being helpful, I include below the format of a FSA definition file.

FSA definition file

The file is formatted as follows:

Line 1: This holds a string. The string represents the alphabet, so every character in the string (including a blank) is part of the alphabet except for the newline character at the end. A newline character is never part of the string.

Only printable characters with ASCII codes in the range 32-126 can be in the alphabet. In the rest of this description we use α as the the number of characters in the alphabet.

Line 2: This line holds a single number. The number is the number of states in the machine. In the rest of this description, η is used to represent the number of states.

State 0 is always taken to be the starting state.

Line 3: This line holds one or more numbers in the range $0 - (\eta - 1)$. These are the numbers of the accepting states. Adjacent numbers are separated by a single space.

The next η lines: Each of these lines represents a row in the table for the transition function (δ). The first line represents the row for state 0, the next line the row for state 1, etc.

Each line has α numbers, with adjacent numbers separated by a single space. The first number is the state to transition to if the character read is the first character of the string in line 1. The second number is the state to transition to if the second character in the string on line 1 is the character read, and so on.

Teams

You may work in pairs or individually. You may pick your own partner if you work with someone else.