CSCI3136
Assignment 2

Instructor: Alex Brodsky

Due: 3:00pm, Monday, January 27, 2014

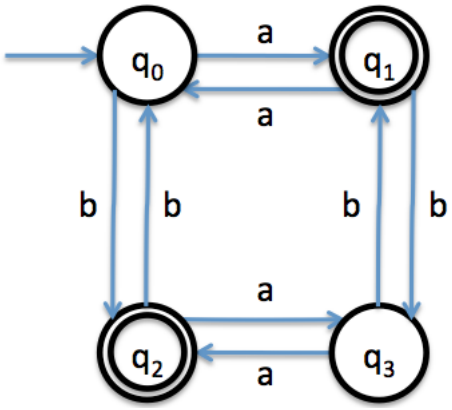
1. **[10 marks]** Construct a DFA for the language of binary strings specified by the following regular expression:

   $$(1|0) * (100|010|001)(0|1)*$$

   Note that the standard approach is to first construct an NFA and transform it to a DFA.

2. **[10 marks]** Recall that $L = \{0^n 1^n | n \geq 0\}$ is not regular. Prove, using the properties of regular languages that, that $L' = \{0^i 1^j | i \neq j\}$ is also not regular.

3. **[10 marks]** Give a regular expression that specifies the language recognized by the following DFA.



4. **[10 marks]** Prove that if $L_0 \subseteq L$, then $L_0^* \subseteq L^*$.

5. **[10 marks]** We know from our discussion that the language $L_P = \{a^p | p \text{ is prime}\}$ is not regular. Is the language L_P^* regular? Be sure to prove your answer. Note: 1 is not a prime number.

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Winter 2014

Student Name	Login ID	Student Number	Student Signature

	Mark
Question 1	/10
Question 2	/10
Question 3	/10
Question 4	/10
Question 5	/10
Total	**/50**

Comments:

Assignments are due by 3:00pm on the due date before class and must include this cover page. Assignment *must* be submitted into the assignment boxes on the second floor of the Goldberg CS Building (by the elevators).

Plagiarism in assignment answers will not be tolerated. By submitting their answers to this assignment, the authors named above declare that its content is their original work and that they did not use any sources for its preparation other than the class notes, the textbook, and ones explicitly acknowledged in the answers. Any suspected act of plagiarism will be reported to the Facultys Academic Integrity Officer and possibly to the Senate Discipline Committee. The penalty for academic dishonesty may range from failing the course to expulsion from the university, in accordance with Dalhousie Universitys regulations regarding academic integrity.