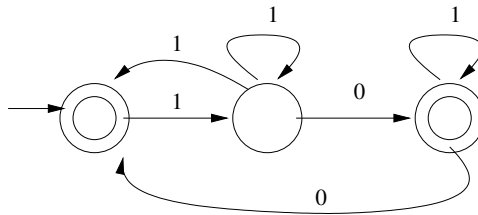


CSE 322  
Autumn Quarter 2003  
Assignment 5  
Due Friday, October 31, 2003

All solutions should be neatly written or type set. All major steps in proofs must be justified.

1. (10 points) In this problem you will practice the process of converting a finite automaton into an equivalent regular expression. Consider the following NFA. Show each of the steps



in the state elimination method for converting the NFA into a regular expression. For each intermediate GNFA, the regular expressions on each transition may be simplified to keep the regular expression as small as possible.

2. (10 points) In this problem you will apply the pumping lemma to show that a language is not regular. Consider the language  $P = \{0^n : n \text{ is prime}\}$ . So  $P = \{0^2, 0^3, 0^5, 0^7, \dots\}$ . Use the pumping lemma to show that  $P$  is not regular.