

CS 4810 Homework Assignment 4 due Monday class Sept 18

1. Create a finite automaton that accepts all strings of 0's and 1's in which some substring of length five has occurred twice.
2. Give a machine construction for $\text{shuffle}(L_1, L_2)$.
3. Minimize the finite automaton below. Its start state is A and the set of final states is {D}.

	0	1
A	B	A
B	A	C
C	D	B
*D	D	A
E	D	F
F	G	E
G	F	G
H	G	D

4. Use the pumping lemma to prove that $\{a^n b^n c^n | n \geq 1\}$ is not a regular set.
5. Use the pumping lemma to prove that

$\{xy | \text{number of a's in } x \text{ equals the number of a's in } y$
 and the number of b's in x equals the number of b's in $y.\}$

is not a regular set.