COSC 440
Exam 2 Review
Fall 2016

Assume that $\Sigma = \{0, 1\}$ unless otherwise noted.

1. Create a deterministic TM for the language $L = \{a^n b^n c^n | n \geq 0\}, \Sigma = \{a, b, c\}$
2. Create a deterministic TM for the language $L = \{w | w$ contains twice as many 0s as 1s$\}$
3. Show that the class of decidable languages is closed under the operation of concatenation, complementation, and Kleene star.
4. Give a PDA for the language $L = \{a^i b^j c^{2i+1} d^k | i, j, k \geq 0\}, \Sigma = \{a, b, c, d\}$
5. Give a CFG for the language $L = \{w \in \{0, 1\}^* |$ the number of 0s in w is (two times the number of 1s) + 1$\}$
6. Show that the language $L = \{a^n b^n c^n | n \geq 0\}, \Sigma = \{a, b, c\}$ is not context-free.
7. Show that $CLIQUE$ is in NP. $CLIQUE = \{< G, k > |$ G is an undirected graph with a k-clique$\}$