

Department of Computer Science, University of Houston
COSC 3340 - Exercise set 2
Fall 2008, Due Wed. Oct. 8 at 2.15pm

1. Prove or disprove: the language $Max(L) = \{w \in L \mid wu \notin L \text{ for any } u \neq \epsilon\}$ is regular for *every* regular language L .
2. Write regular expressions for the following languages:
 - (a) $\{w \in \{0, 1, 2\}^* \mid w \text{ contains the substring } 101 \}$.
 - (b) $\{w \in \{0, 1, 2\}^* \mid w \text{ does not contain the substring } 10 \}$.
 - (c) $\{w \in \{0, 1, 2\}^* \mid w \text{ contains the substring } 10 \text{ and is of even length}\}$.
 - (d) $\{w \in \{0, 1, 2\}^* \mid w \text{ does not contain the substring } 10 \text{ or is of even length}\}$.
3. Use the pumping lemma to prove in detail that the language $\{a^n b^m c^p \mid n, m, p \geq 0, m > p\}$ is not regular.