

Department of Computer Science, University of Houston
COSC 3340 - Exercise set 2
Fall 2004, Due Sept. 28 at 4pm

1. Prove or disprove: the language $X(L) = \{w \in L \mid wy \notin L \text{ for any } y \neq \epsilon\}$ is regular for *every* regular language L .
2. Write regular expressions for the following languages:
 - (a) $\{w \in \{0, 1, 2\}^* \mid w \text{ contains the substring } 01 \}$.
 - (b) $\{w \in \{0, 1, 2\}^* \mid w \text{ does not have the substring } 01 \text{ and } w \text{ has the substring } 10\}$.
3. Use the pumping lemma to prove in detail that the language $\{a^n b^m \mid 2n < m\}$ is not regular.