

## CMPE 350 - Spring 2016

### PS 3 - 02.03.16

**1.29** Use the pumping lemma to show that the following languages are not regular.

b)  $A_2 = \{www \mid w \in \{a, b\}^*\}$

c)  $A_3 = \{a^{2^n} \mid n \geq 0\}$

**1.46** Prove that the following languages are not regular. You may use the pumping lemma and the closure properties of the class of regular languages under union, intersection and complement.

a)  $L = \{0^n 1^m 0^n \mid m, n \geq 0\}$

c)  $L = \{w \mid w \in \{0, 1\}^* \text{ is not a palindrome}\}$

**1.54** Consider the language  $F = \{a^i b^j c^k \mid i, j, k \geq 0 \text{ and if } i = 1, \text{ then } j = k\}$

a) Show that  $F$  is not regular.