

Theory of Computation (CSC 339) – Fall 2023

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Tutorial 4: Pumping Lemma

1. Use the pumping lemma to show that the following languages are not regular.
 - (a) $A_1 = \{0^n 1^n 2^n | n \geq 0\}$.
 - (b) $A_2 = \{a^{2^n} | n \geq 0\}$, a^{2^n} is a string of 2^n a's.
2. For each of the following languages, give the minimum pumping length and justify your answer.
 - (a) 0001^*
 - (b) 0^*1^*
 - (c) $0^*1^+0^+1^* + 10^*1$
3. Prove that the following language is not regular: $\{0^m 1^n | m \neq n\}$.