CIT 596 Recitation, Week 5

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Usage of Pumping Lemma

Jean Gallier says in his Notes:

> "In order to show that the pumping lemma is contradicted, one needs to show that for some DFA D, for every $m \geq 1$, there is some string $w \in L(D)$ of length at least m, such that for every possible decomposition $w = uxv$ satisfying the constraints $x \neq \epsilon$ and $|ux| \leq m$, there is some $i \geq 0$ such that $ux^i v \notin L(D)$."

[Exercise] @sipser13 [p. 88-91] exercise 1.29, exercise 1.46

Determine if the following language is regular or not.

- $\{0^n 1^n 2^n | n \geq 0\}$
- $\{a^{2^n} | n \geq 0\}$
- $\{0^m 1^n | m \neq n\}$

- Let $A/B = \{w | wx \in A$ for some $x \in B\}$. Show that if A is regular and B is any language, then A/B is regular.