CS 181 Spring 2018 Homework Week 7

Due Monday 21 May 4:00pm online

0. Consider the following language over ∑ = { a, b, c }:

   $L_0 = \{ a^i b^j c^k \mid i=j \text{ or } j=k \}$

Determine whether L_0 is: i) finite state or ii) context free & not finite state. If i, show it by any means we have covered in class. If ii, give a context free grammar for it and use the Pumping Lemma for Finite State Languages to show that it is not finite state.

1. Consider the following language over ∑ = { a, b, # }:

   $L1 = \{ a^n b^m \# \mid n > m \}$

Determine whether L1 is: i) finite state or ii) context free & not finite state. If i, show it by any means we have covered in class. If ii, show a PDA for L1 as a transition diagram and prove that it is not finite state by any means discussed in class.

2. Consider the following language over ∑ = { 0, 1, # }:

   $L2 = \mathbf{\{}\ t \# t^R \# t \mid t \text{ in } \{ 0, 1 \}^* \mathbf{\}}$

Prove that it is not context free using the Pumping Lemma for context free languages.

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