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CS 420/520 Theory of Computation, Spring 2019 at Indiana State University, taught by Jeff Kinne

Quiz 10 - context free languages

Points - each part is graded as 1 point, half credit is possible.

1) Give a CFG or PDA.

 L = complement of the language {a^n b^n | n >= 0}

 In the language: aab, abb, aaa, abab, babaaa, abba

 Not in the language: ab, aabb, empty string, aaabbb

2) Give a CFG or PDA.

 L = {w such that every prefix of w contains at least

 as many a's as b's}

 In the language: aaba, ab, aababb

 Not in the language: b, abb, ba, bbaa

3) Prove the language it is not CF using the pumping lemma for CF's.

 L = {strings of a's, b's, c's with the same number of each letter}

 In the language: abc, abaccb, aaabcbcbc

 Not in the language: ab, c, abcab, aabbccc

4) Give a PDA or CFG.

 L = strings of ( and ) that follow the rules –

 same number of ) as (,

 for each prefix of the string there are not more ) than (

 In the language: (), (()), (()())

 Not in the language: (, ), )(, (()))()