

CS 301: Theory of Automata
Assignment 2
Due: Thursday 31st October, 2019 (In class).

ONLY HANDWRITTEN ASSIGNMENTS WOULD BE ACCEPTED. CHEATING CASES WILL BE ASSIGNED A -10

Problem 1

$$\Sigma = \{0,1\}$$

$$L = \{0^i 1^j \mid i < j\}$$

- a. Write a context free grammar for the above language
- b. Make a PDA for the above language

Problem 2

Suppose $\Sigma = \{0,1,@\}$. Consider the language:

$$L = \{s_1@s_2@s_3@...@s_k \mid k > 1 \text{ and each } s_i \in \{0,1\}^* \text{ and there exist an } i, j \ (i \neq j) \text{ for which } s_i = s_j^R\}.$$

Examples of strings in L are: {01@10, 110@11111@011, ...}

- a. Write a context free grammar for the above language
- b. Make a PDA for the above language

Problem 3

$$\Sigma = \{0,1,2\}$$

$L = \{s \mid s \text{ has any number of 1's but the number of zeros are more than the number of twos}\}$

Examples of strings in this language: {0210011, 1200, 000, ...}

- a. Write a context free grammar for the above language
- b. Make a PDA for the above language