CSE331 Automata and Computability

ASSIGNMENT 2 FALL 2024 TOTAL MARKS: 25 DEADLINE: 29 DECEMBER, 2024

CSE331

There are a total of five problems. You have to solve all of them.

Problem 1 (CO5): Nonregular Language (25 points)

Use the pumping lemma to **demonstrate** that L_1 , L_2 , L_3 , L_4 and L_5 is not regular.

- (a) $L_1 = \{ww \mid w \in \{0,1\}^*\}$ (5 points)
- (b) $L_2 = \{w \in \{0,1\}^* : 0^x 1^y 0^z \text{ where } z > x + y \text{ and } x, y \ge 0 \}$ (5 points)
- (c) $L_3 = \{w \in \{0,1\}^* : w \text{ is a palindrome}\}\ (5 \text{ points})$
- (d) $L_4 = \{w \in \{a,b\}^* : \text{ numbers of a in } w \text{ is a prime number} \}$ (5 points)
- (e) $L_5 = \{w \in \{0\}^* : 0^{3^n} \text{ where } n \ge 0\}$ (5 points)

