Theory of Automata: Assignment 1

Due on: 12 Sept, 2024 (in class)

Submit assignment in hard form. Also submit the soft form on gcr in case we are not able to find your hard form. Plagiarism gets minimum zero and maximum of F in course. No extension in deadline shall be given.

Question No: 1

a. Provide a recursive definition of language having all strings with length multiple of 2.
b. Provide recursive definition of odd palindrome.
c. Give a recursive definition of the language where every string starts and ends on the same double letter.

Question No:2

For the following languages

a. Write an RE
b. Design an FA, and
c. Design a TG. (only if the FA in part b can be expressed in a compressed way using a TG).
    i. All words that do not have ab.
    ii. All strings that do not have abb.
    iii. All words that start with aa or end with bb.
    iv. All words where b is never tripled. This means words never contain bbb.
    v. All words in which the total number of a's is divisible by three.
    vi. All strings where any a's that occur are in clumps/groups of 4.
    vii. All strings that end with ba.
    viii. All strings that never end on ba.

Question No:3

Show that:

a. ((a+bb)*aa)*is equivalent to Λ + (a+bb)*aa in a sense they define the same language.
b. a(ba + a)*b is equivalent to aa*b(aa*b)* In a sense they define the same language.