CMPSC 464: Introduction to the Theory of Computation **Date: 08/31/2022**

Recitation #1 Solution

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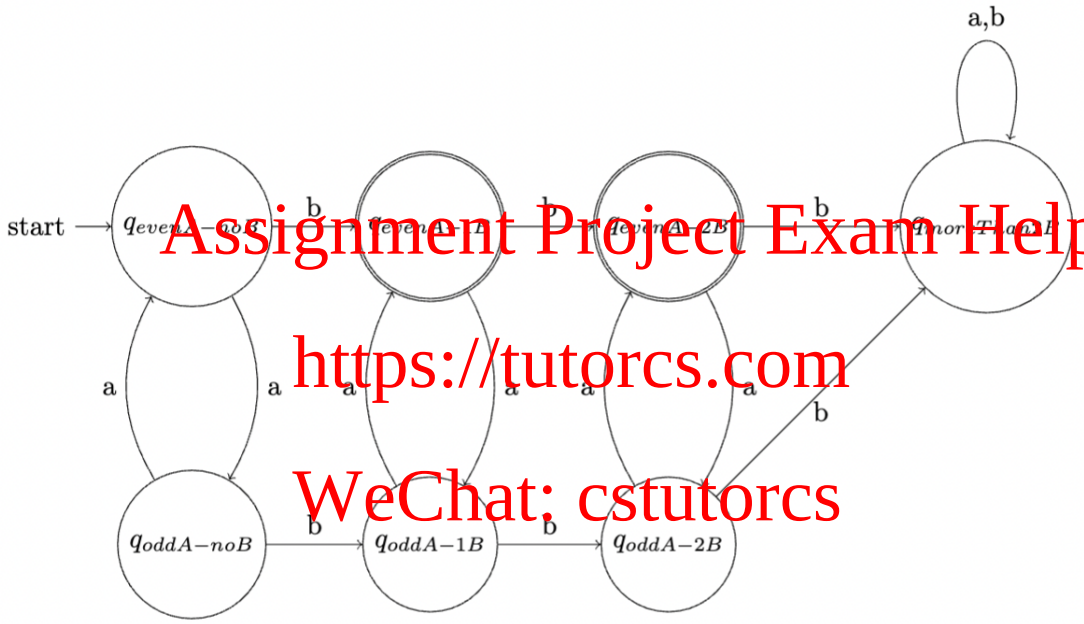
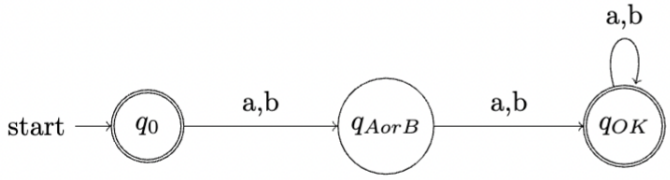
Problem 1

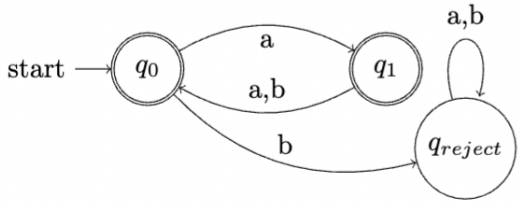
(a) M_a :



(b) M_b :



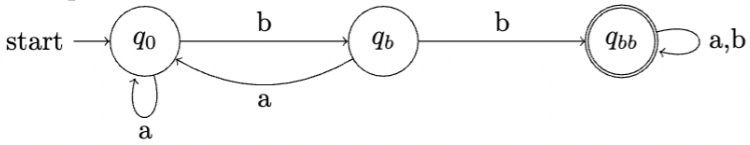
(c) M_c :



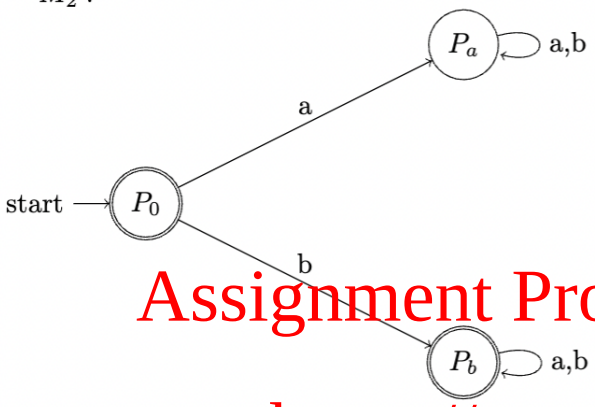
Problem 2

Let L_1 be set of strings with substring "bb," and L_2 those not starting with "a." Then $L = L_1 \cup L_2$. We construct M_1 and M_2 respectively for L_1 and L_2.

M_1 :



M_2 :



Now, lets construct an FA $M = (Q, \sum, \delta, q_s, F)$ based on Theorem 1.25

$Q = Q \times Q \implies M$ has 3×3 states.

- δ : shown in state diagram.
- $q_s = (q_0, P_0)$
- $F = \{(q_0, P_a), (q_0, P_b), (q_b, P_0), (q_b, P_b), (q_{bb}, P_b), (q_{bb}, P_0), (q_{bb}, P_a)\}$