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CSE 105 HW 5

Warmup: Given a regular language A with DFA M = {Q, Σ, δ, {q0}, F}, construct a DFA M’ that recognizes A^R. M’ = {Q ∪ {q0’}, Σ, δ’, q0’, {q0}} where:

1. δ' (q0’ , ) = F
2. δ’ (q0’ , a) = ∅ all a ∈ Σ
3. δ’ (p, a) = {q|δ(q, a) = p} all q ∈ Q, a ∈ Σ
4. The empty string is the same thing as the empty string reversed
5. The null string is the same thing reversed
6. Every transition is reversed

Problem 1:

1. CFG D = ({S,T}; {0, 1}; R; S) with R = {S -> 0 | 1| S | T, T -> 01}
   1. This grammar describes the language because it allows for any number of “0”’s and “1”’s but will always end with a “01”
2. D^R = {w^R | w ∈ D}
   1. CFG D’ = ({A,B}; {0, 1}; R; A) with R = {A -> 10B, B -> 0 | 1 | (empty string)| B}