Challenge Activity 3 – NFAs

Consider that a software team needs to implement an algorithm able to give an FA[1] (DFA or NFA) with the complement of the language expressed by an input NFA. The team is discussing if the algorithm used for transforming a DFA A in a DFA B representing the complement of the language of DFA A can be applied to the input NFAs.

(a) Describe the application of such algorithm to NFAs and explain why it does not work;

(b) One of the members of the team suggested that a step completing the input NFA (i.e., completing each state such that all the symbols of the alphabet have transitions) would make feasible to apply such algorithm. Discuss this suggestion in terms of the applicability of the algorithm.

(c) Describe an algorithm that can be used to transform every NFA A in an FA B representing the complement of the language represented by NFA A.

[1] Finite Automaton.