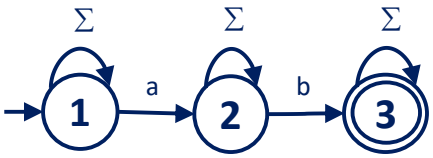
Preparation Activity PA03 – NFAs

A team of software developers needs to develop a text pre-processor to recognize the existence of at least one substring starting with an 'a' and finishing with a 'b' in a text message. For that they propose the use of the following NFA (note that for the sake of this exercise, we consider ∑={a,b,c,d}, instead of the alphabet of the ASCII being considered by the team):



(a) Why is this FA (Finite Automaton) an NFA and not a DFA?
(b) Present the formal notation (i.e., using the 5-tuple and defining each element of the tuple) of this NFA;
(c) Present the table of transitions of the NFA;
(d) Convert the NFA to a DFA using the subset construction technique and draw the state diagram of the resultant DFA.