Challenge 4 –Finite Automata (ε-NFAs and DFAs) and Induction
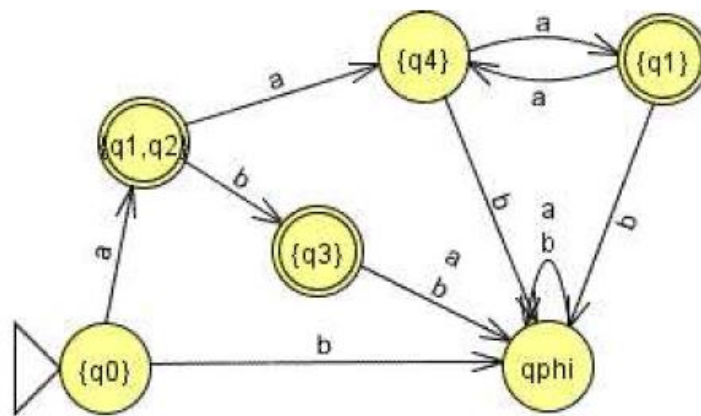
Suppose that you are a developer that translated the regular expression ab + (a(aa)*) to the following DFA:

and now you intend to prove using the induction method that the DFA accepts the strings represented by the regular expression. Do you think it is possible? If so, present the proof.