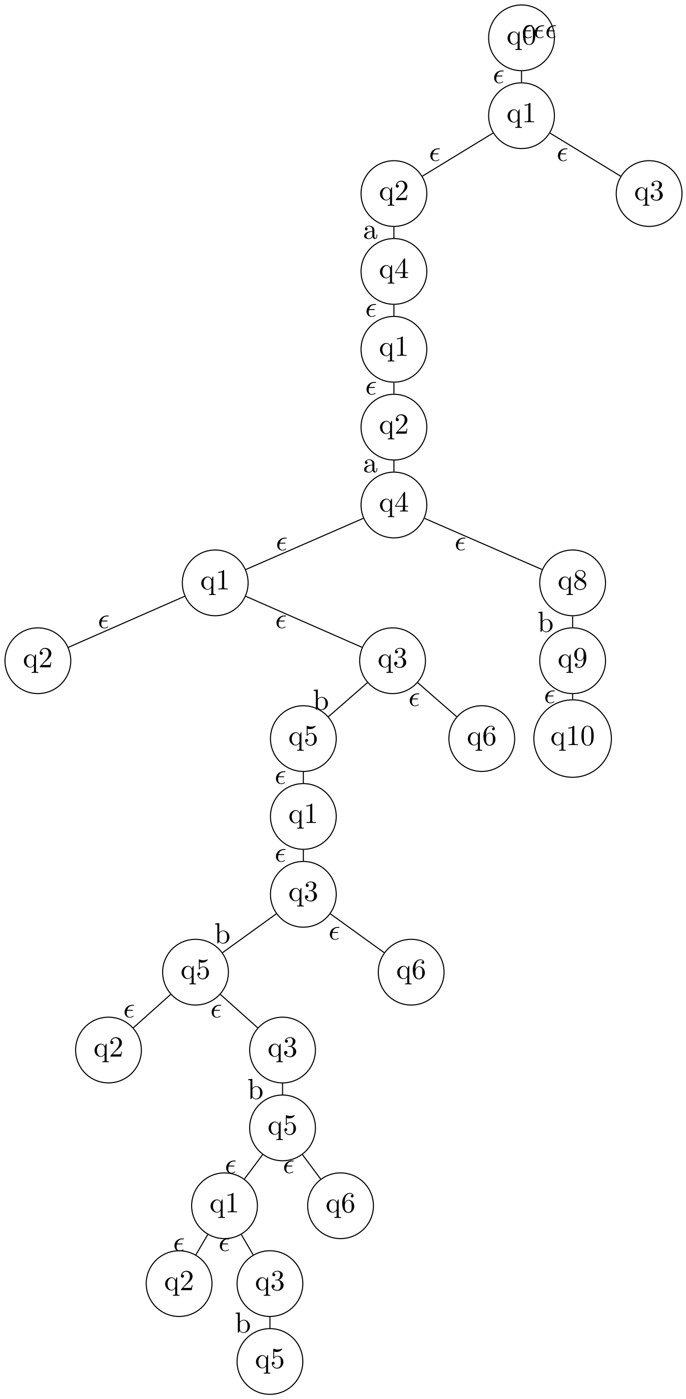
1. Here the FA contains many epsilon transition.

   But finally the last 2 symbol which has to be there in the string so that the automata accepts it is ba.

   When the second last symbol is b , it is on the 3rd last state. Then since the transition is epsilon , it goes to the second last state with out any symbol and then finally accepts a and go to final state.

   Thus the last two symbol has to be ba.

   In the string , aabbaba the last 2 symbol is ba. Thus it is accepted by the automata while in the string aabbabb the last two symbol is ba. It will never go to final state. Thus it is not accepted by the automata.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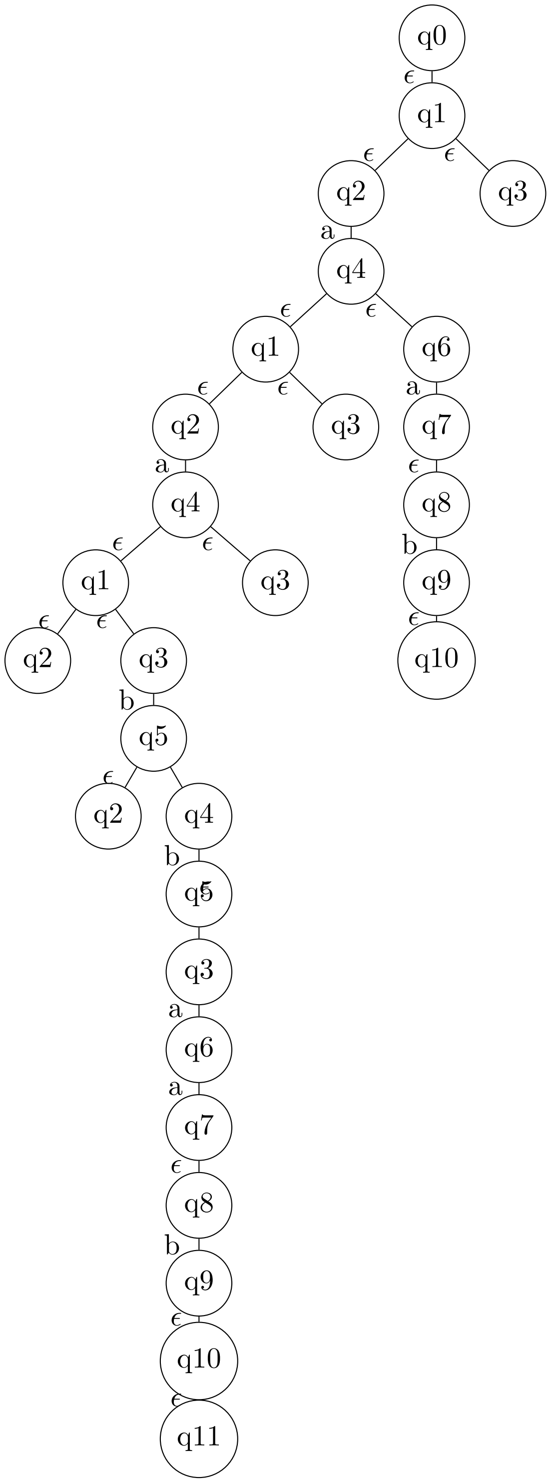
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q10
ϵ
q11

2. Use Nerode's equivalance relation to show that language a^*b^* is regular and the language $\{a^nb^n|n \in N\}$ is not. What about language $\{a^nb^*|n \in N\}$

In order to show that the Language L = a*b* is regular we show that L has only 3 equivalence classes:

$[\epsilon]$: This consists of all the strings in the Language.

$[b]$: Any string of the form bn is in this class.

$[\phi]$: All strings not in L.

Since L has only 3 equivalence classes, L is regular.

The language $L = anbn|n >= 0$ as it has infinite equivalence classes:

1) $[\epsilon]$: consisting of strings in L

2) $[a]$: consisting of strings of the form $an - 1bn$

3) $[a^2]$: consisting of strings of the form $an - 2bn$

4) and so on

Hence the language is not regular.

The language $L = \{a^nb^*|n \in N\}$ is regular as it is same as the language $a + b*$.