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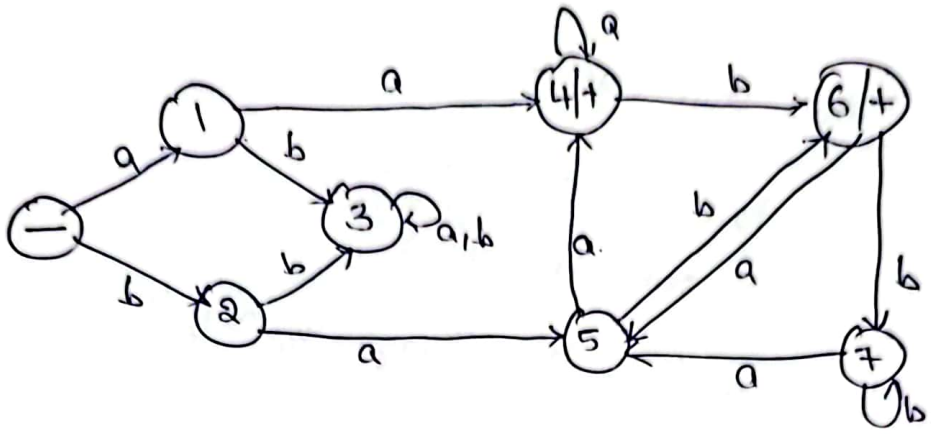
Question-2:

Given Finite Automata is



Regular Expression:

$$(b+a)\,a\,a^* + a\,(a+b)^*b + b\,(a+b)^*a + b(a+b)^*b$$

↳ Using the above regular expression we can form the given string examples.

↳ With this example, the finite automata starts with either a (or) b and 2nd letter from the starting is "a".

↳ The finite automata starts with either a (or) b and ends with the different letter from the starting letter. Suppose it is starts with "b" then it must end with "a" and if it is starts with "a" then it must end with "b".

Examples:

aaa = $q_0 \xrightarrow{a} q_1 \xrightarrow{a} q_4 \xrightarrow{a} q_4$

final state (accepting)

aaab = $q_0 \xrightarrow{a} q_1 \xrightarrow{a} q_4 \xrightarrow{a} q_4 \xrightarrow{b} q_6$

final state (accepting)

baa = $q_0 \xrightarrow{b} q_2 \xrightarrow{a} q_5 \xrightarrow{a} q_4$

final state (accepting)

babaabbaa = $q_0 \xrightarrow{b} q_2 \xrightarrow{a} q_5 \xrightarrow{b} q_6 \xrightarrow{a} q_5 \xrightarrow{a} q_4 \xrightarrow{b} q_6 \xrightarrow{b} q_7 \xrightarrow{a} q_5 \xrightarrow{a} q_4$

final state (accepting).

Rejected Strings:

ba = $q_0 \xrightarrow{b} q_2 \xrightarrow{a} q_5$

unaccepted

bbb = $q_0 \xrightarrow{b} q_2 \xrightarrow{b} q_3 \xrightarrow{b} q_3$

unaccepted

aba = $q_0 \xrightarrow{a} q_1 \xrightarrow{b} q_3 \xrightarrow{a} q_3$

unaccepted.