Quiz 2 from Spring 2021 (Practice)

STUDENT NAME

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Q1 NFA to DFA
8 Points

Convert the following NFA into a DFA using the subset construction algorithm (the one used in class and in project 3).
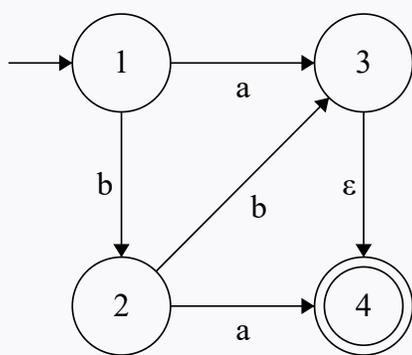
Fill in the 5 parts of the NFA below. The exact format should resemble that of project 3, but it does not need to match exaclty. Just make sure it's clear what you mean.

The alphabet Σ. (`epsilon` is a string over any alphabet. Do not list `epsilon` in the alphabet)

Enter your answer here

The list of states Q.

Enter your answer here

The start state q_0.

Enter your answer here

A list of transitions δ containing tuples of the form (*from*, *letter*, *to*).

Enter your answer here

A list of final states F.

Enter your answer here

Save Answer

Q2 NFA to Regex
4 Points

Consider the following NFA:
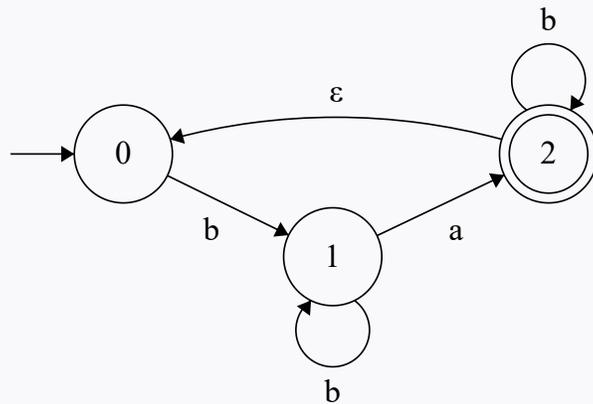
Write down a regular expression for the language accepted by this NFA:

Enter your answer here

Which of the following strings will be accepted by the NFA above:

☐ bbaba

☐ babbaba

☐ bbaabb

☐ bbbab

Save Answer

Q3 Subset construction
4 Points

Which of the following DFA would the following NFA convert to using subset construction?
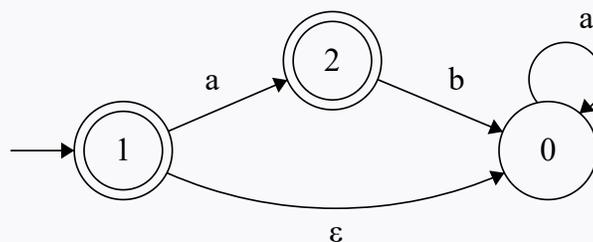

Choose from the following:

○

Multiple choice option diagrams with states 0,1 → a → 0,2 → b → 0 (with self-loop a on state 0)

○

States 0,1 (with self-loop a) → a → 0,2 → a,b → 0 (with self-loop a)

○

States 0,1 → a → 0,2 → a,b → 0 (with self-loop a)

○

States 1 → a → 0,2 → a,b → 0 (with self-loop a)
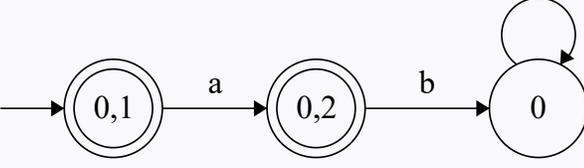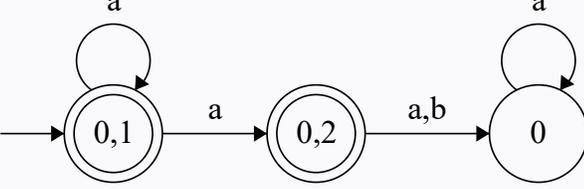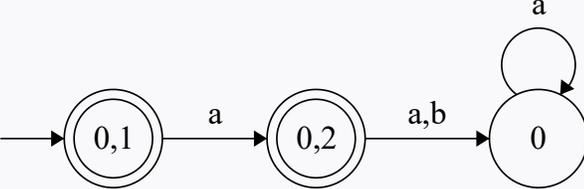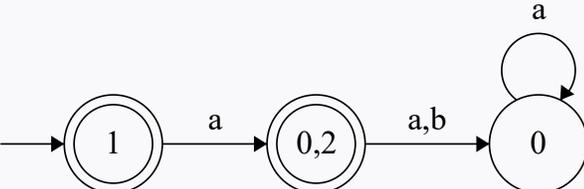
Save Answer

Q4 NFA modification
6 Points

The NFA below accepts both `aba` and `cdc`. For each of the following strings, add one transition to the NFA so that `aba`, `cdc`, and the new string are accepted:

NFA diagram: state 1 (start) → a → state 2 → b → state 4 → a → state 6 (accepting); state 1 → c → state 3 → d → state 5 → c → state 7 (accepting)
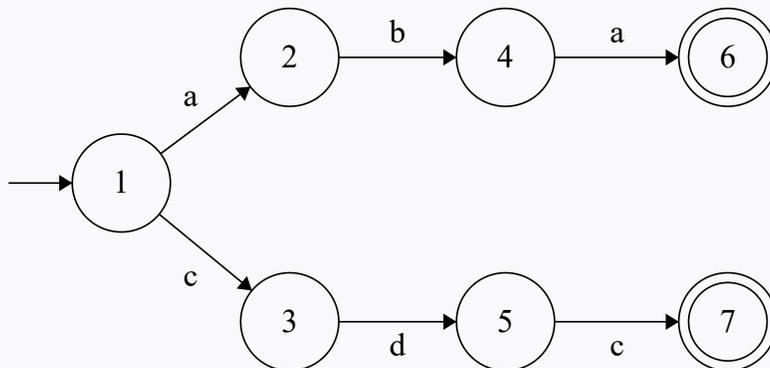
What transition could be added (same format as question 1) so that the string "**cc**" is accepted?

Enter your answer here

What transition could be added (same format as question 1) so that the string "**ab**" is accepted? This part is separate from the first part: this transition will be added to the original NFA.

Enter your answer here

What transition could be added (same format as question 1) so that the string **"abaaba"** is accepted? This part is separate from the first and second part: this transition will be added to the original NFA.

Enter your answer here

Save Answer

Save All Answers

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