



Zayd

## Homework Assignment Submitted Successfully.

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**You obtained a score of 9.0 points, out of a possible 9.0 points.**

**You have answered all the questions correctly.**

**Congratulations, you have achieved the maximum possible score.**

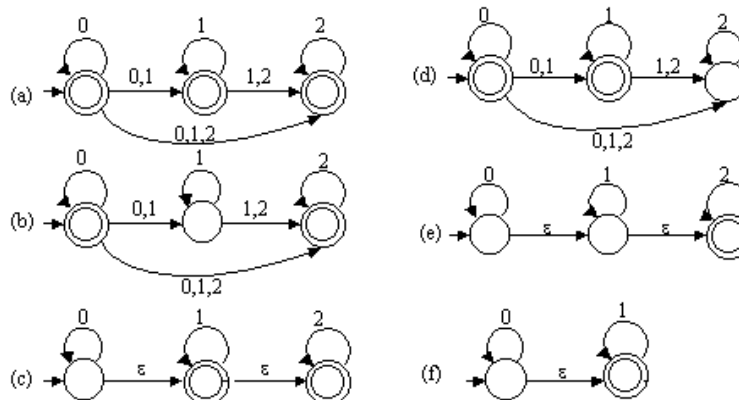
**Submission number:** 59871  
**Submission certificate:** JA468847  
**Submission time:** 2014-02-08 19:33:51 PST (GMT - 8:00)

**Help**

**Number of questions:** 3  
**Positive points per question:** 3.0  
**Negative points per question:** 1.0  
**Your score:** 9

Based on Section 2.5 of HMU

1. Identify which automata define the same language and provide the correct counterexample if they don't. Choose the correct statement from the list below.

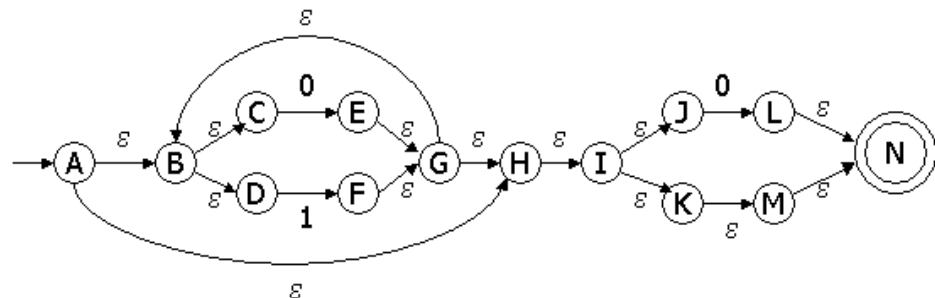


- a) (a) and (f) define the same language.
- b) (a) and (d) do not define the same language and the following counterexample shows it. String 0012 is accepted by one and not by the other.
- c) (b) and (f) define the same language.
- d) (c) and (f) do not define the same language and the following counterexample shows it. String 001 is accepted by one and not by the other.

Answer submitted: **b)**

You have answered the question correctly.

2. Here is an epsilon-NFA:



Suppose we construct an equivalent DFA by the construction of Section 2.5.5 (p. 77). That is, start with the epsilon-closure of the start state A. For each set of states  $S$  we construct (which becomes one state of the DFA), look at the transitions from this set of states on input symbol 0. See where those transitions lead, and take the union of the epsilon-closures of all the states reached on 0. This set of states becomes a state of the DFA. Do the same for the transitions out of  $S$  on input 1. When we have found all the sets of epsilon-NFA states that are constructed in this way, we have the DFA and its transitions.

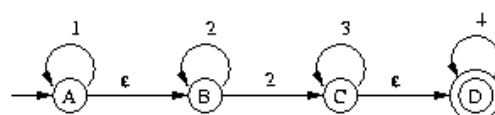
Carry out this construction of a DFA, and identify one of the states of this DFA (as a subset of the epsilon-NFA's states) from the list below.

- a) BCDFGHIJK
- b) BCDGHIJKMN
- c) BCDFGHIJKMN
- d) BCD

Answer submitted: **c)**

You have answered the question correctly.

3. Here is a nondeterministic finite automaton with epsilon-transitions:



Suppose we use the extended subset construction from Section 2.5.5 (p. 77) to convert this epsilon-NFA to a deterministic finite automaton with a dead state, with all transitions defined, and with no state that is inaccessible from the start state. Which of the following would be a transition of the DFA?

Note: we use  $S \xrightarrow{x} T$  to say that the DFA has a transition on input  $x$  from state  $S$  to state  $T$ .

- a)  $\{B, C, D\} \xrightarrow{2} \{B, C, D\}$
- b)  $\{A, B, C\} \xrightarrow{3} \{C, D\}$
- c)  $\{B, C, D\} \xrightarrow{2} \{B, C\}$
- d)  $\{C, D\} \xrightarrow{\epsilon} \{D\}$

Answer submitted: **a)**

You have answered the question correctly.