0/7 Questions Answered

Week 3 Monday Review Quiz

Student Name

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Q1 NFA and DFA
2 Points

True or False: The state diagram of any DFA is also the state diagram of a NFA.

True

False

True or False: The state diagram of any NFA is also the state diagram of a DFA.

True

False

True or False: The formal definition $(Q, \Sigma, \delta, q0, F)$ of any DFA is also the formal definition of a NFA.

True

False

True or False: The formal definition $(Q, \Sigma, \delta, q0, F)$ of any NFA is also the formal definition of a DFA

True

False

Save Answer

Q2 Working with a language

4 Points

Fix the alphabet $\Sigma = \{a, b\}$ for this whole question. Consider the language $\{w \in \Sigma^* \mid w \text{ has an } a \text{ and ends in } b\}$.

Q2.1

1 Point

Select all and only of the following strings of length 3 that are in this language.

- [ ] aaa
- [ ] aab
- [ ] aba
- [ ] abb
- [ ] baa
- [ ] bab
- [ ] bba
- [ ] bbb

Save Answer

Q2.2
1 Point

What are other ways of representing this language? (Select all and only correct choices)

- [ ] $\{w \in \Sigma^* \mid w \text{ has an } a\} \circ \{w \in \Sigma^* \mid w \text{ ends with } b\}$
- [ ] $\{w \in \Sigma^* \mid w \text{ has an } a\} \cup \{w \in \Sigma^* \mid w \text{ ends with } b\}$
- [ ] $\{w \in \Sigma^* \mid w \text{ has an } a\} \cap \{w \in \Sigma^* \mid w \text{ ends with } b\}$
- [ ] $\{w \in \Sigma^* \mid w \text{ has an } a\}^* \{w \in \Sigma^* \mid w \text{ ends with } b\}^*$

Save Answer

Q2.3
2 Points

What are other ways of representing this language? (Select all and only correct choices)

- [ ] $\{w \in \Sigma^* \mid w \text{ is not the empty string}\}$
- [ ] $\{w \in \Sigma^* \mid w \text{ has an } a \text{ or ends in } b\}$
- [ ] $\{w \in \Sigma^* \mid w \text{ has } ab \text{ as a substring}\}$
- [ ] $\{w \in \Sigma^* \mid w \text{ ends with } ab\}$
- [ ] $\{w \in \Sigma^* \mid w \text{ starts with } ab\}$
- [ ] None of the above

Save Answer

Q3 Construction for NFA

1 Point

In the formal construction of a NFA that recognizes the union of languages recognized by given NFA (in today's notes and also in Theorem 1.45 on page 59 of the book), we have this part of the definition of the transition function: $\delta(q_0, x) = \emptyset$ for $x \in \Sigma$. Why?

(Select the best description)

- Because we have spontaneous moves from the start state of the new NFA for all possible inputs.
- Because there are no non-spontaneous moves from the start state of the new NFA.

Save Answer

Q4 Construction for DFA

3 Points

In the formal construction of a DFA that recognizes the union of languages recognized by given DFA (in today's notes and also in Theorem 1.25 on page 45 of the book), the set of states is the Cartesian product of the sets of states of the two given DFAs.

Let Q_1 and Q_2 be the sets of states of the given DFA.
Let F_1 and F_2 be the sets of accepting states of the given DFA.

(Select all and only correct options)

- [ ] If we are constructing a DFA that recognizes the **union** of the languages recognized by the given DFA, the set of **accepting** states is $F_1 \times F_2$
- [ ] If we are constructing a DFA that recognizes the **union** of the languages recognized by the given DFA, the set of **accepting** states is $Q_1 \times Q_2$
- [ ] If we are constructing a DFA that recognizes the **union** of the languages recognized by the given DFA, the set of **accepting** states is $F_1 \cup F_2$
- [ ] If we are constructing a DFA that recognizes the **union** of the languages recognized by the given DFA, the set of **accepting** states is $Q_1 \cup Q_2$
- [ ] If we are constructing a DFA that recognizes the **union** of the languages recognized by the given DFA, the set of **accepting** states is $(Q_1 \times F_2) \cup (F_1 \times Q_2)$
- [ ] If we are constructing a DFA that recognizes the **intersection** of the languages recognized by the given DFA, the set of **accepting** states is $F_1 \times F_2$
- [ ] If we are constructing a DFA that recognizes the **intersection** of the languages recognized by the given DFA, the set of **accepting** states is $Q_1 \times Q_2$
- [ ] If we are constructing a DFA that recognizes the **intersection** of the languages recognized by the given DFA, the set of **accepting** states is $F_1 \cap F_2$
- [ ] If we are constructing a DFA that recognizes the **intersection** of the languages recognized by the given DFA, the set of **accepting** states is $Q_1 \cap Q_2$
- [ ] If we are constructing a DFA that recognizes the **intersection** of the languages recognized by the given DFA, the set of **accepting** states is $(Q_1 \times F_2) \cap (F_1 \times Q_2)$

Save Answer

Q5 Feedback
0 Points

Any feedback about this week's material or comments you'd like to share? (Optional; not for credit)

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