Register for Certification exam (https://examform.nptel.ac.in/2022_04/exam_form/dashboard)

Course outline

How does an NPTEL online course work? ()

Week - 0 ()

Week - 1 ()

- Introduction to Finite Automata (unit?unit=17&lesson=18)
- Basic Notation and Convention, DFA (unit?unit=17&lesson=19)
- Example of DFAs (unit?unit=17&lesson=20)
- Computation by DFA and Regular operation (unit?unit=17&lesson=21)
- Introduction to Nondeterminism (unit?unit=17&lesson=22)
- **Quiz: Week 1: Assignment 1 (assessment?name=84)**
- Feedback For Week 1 (unit?unit=17&lesson=23)

Week 1: Assignment 1

The due date for submitting this assignment has passed.

Due on 2022-08-10, 23:59 IST.

Assignment submitted on 2022-08-10, 20:36 IST

1) L_1 and L_2 are regular languages. ***1 point***

Define $L_3 = L_1 \cap \{\overline{L}_2 \cup \overline{L}_1\}$ and $L_4 = L_1 \cup \{\overline{L}_2 \cap \overline{L}_1\}$.

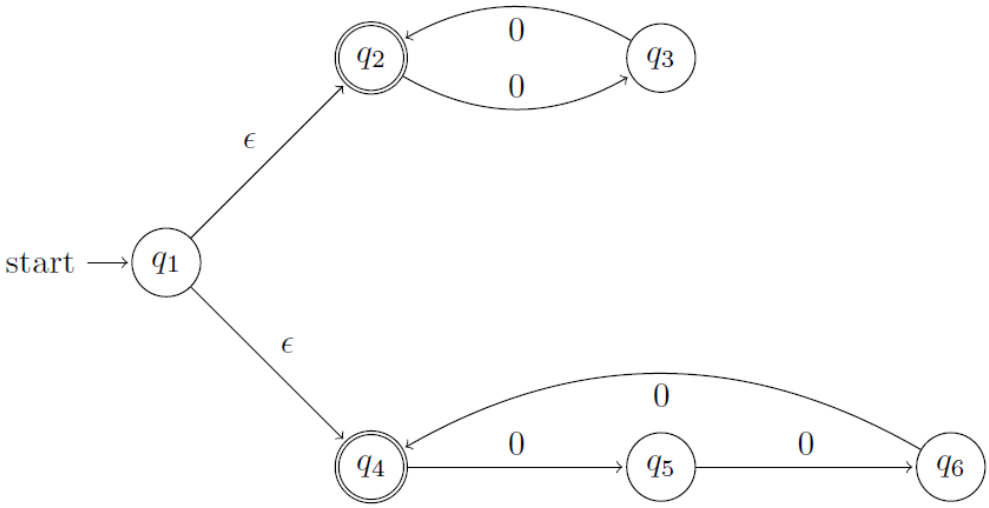
Which of the following statements is correct?

- L_3 is regular but L_4 is not regular.
- L_3 is not regular but L_4 is regular.
- Both L_3 and L_4 are regular.
- Neither L_3 nor L_4 is regular.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Both L_3 and L_4 are regular.

2) Consider the following NFA: ***1 point***



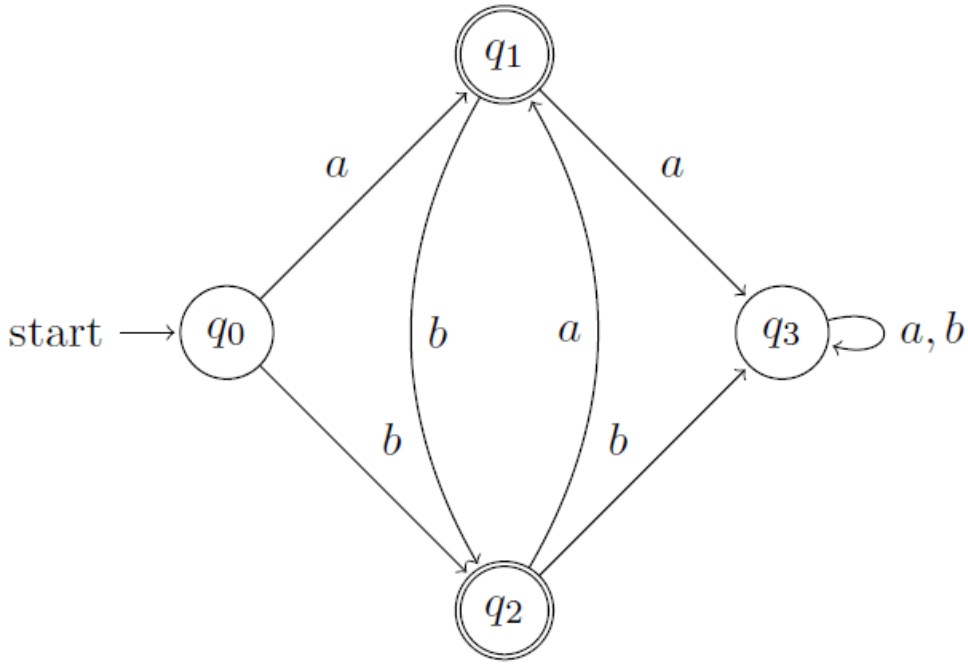
Which of the following is the correct description of language recognized by the NFA?

- $L = \{w \in \{0\}^* \mid |w| \text{ is divisible by 1 or 2}\}$.
- $L = \{w \in \{0\}^* \mid |w| \text{ is divisible by 2 or 3}\}$.
- $L = \{w \in \{0\}^* \mid |w| \text{ is divisible by 1 or 3}\}$.
- $L = \{w \in \{0\}^* \mid |w| \text{ is divisible by 3 or 4}\}$.

Yes, the answer is correct.
Score: 1
Accepted Answers:
$L = \{w \in \{0\}^* \mid |w| \textit{ is divisible by 2 or 3}\}$.

3) Let $\Sigma = \{a, b\}$. ***1 point***

Which of the following is the correct description of language recognized by the DFA below?



Set of nonempty strings which contains either 'aa' or 'bb'.

Set of nonempty strings having all b's after all a's.

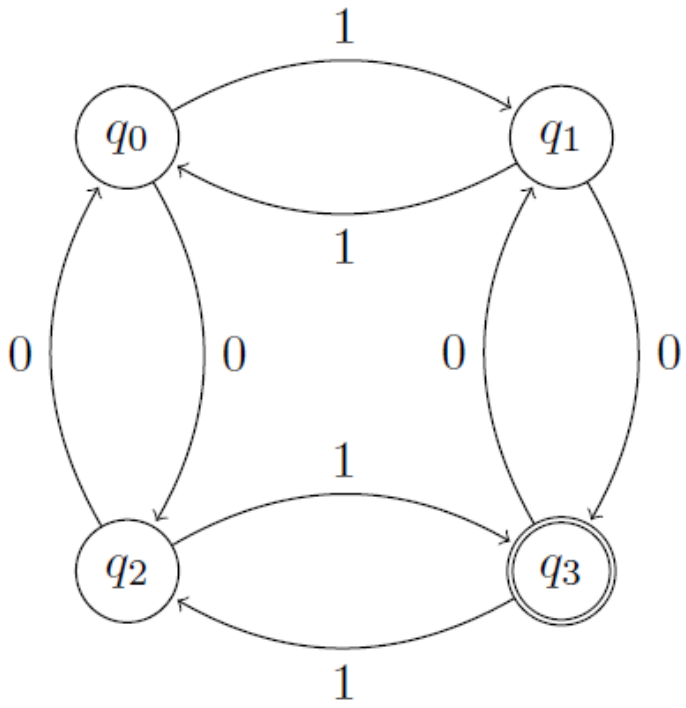
Set of nonempty strings which ends with 'aa' or 'bb'.

Set of nonempty strings whose characters alternate between a's and b's.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Set of nonempty strings whose characters alternate between a's and b's.

4) Which state in the following DFA should be made the initial state to make it accept the language $L = \{w \in \{0,1\}^* | w$ has even no of 1's and odd number of 0's$\}$? ***1 point***



q_0

q_1

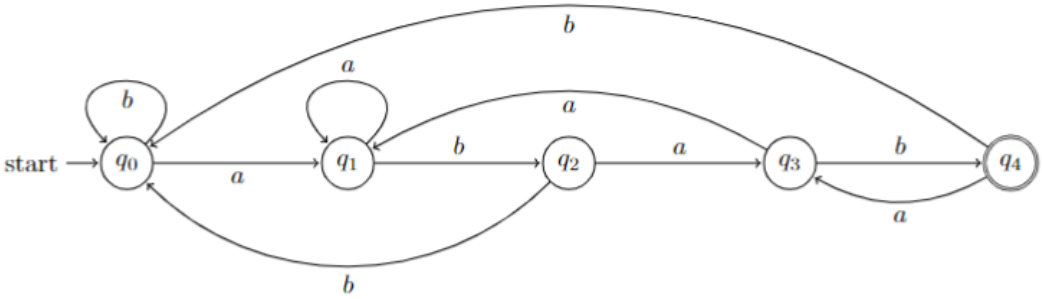
q_2

q_3

Yes, the answer is correct.
Score: 1

Accepted Answers:
q_1

5) What is the language accepted by the following NFA? ***1 point***



The set of string containing $abab$ as substring.

The set of strings beginning with $abab$.

The set of strings ending with $abab$.

The set of strings with $babab$ as substring.

Yes, the answer is correct.
Score: 1

Accepted Answers:
The set of strings ending with $abab$.

6) **1 point**

Let $L \subseteq \{0,1\}^*$. Which of the following is true?

If L is regular, all subsets of L are regular.

If all proper subsets of L are regular, then L is regular.

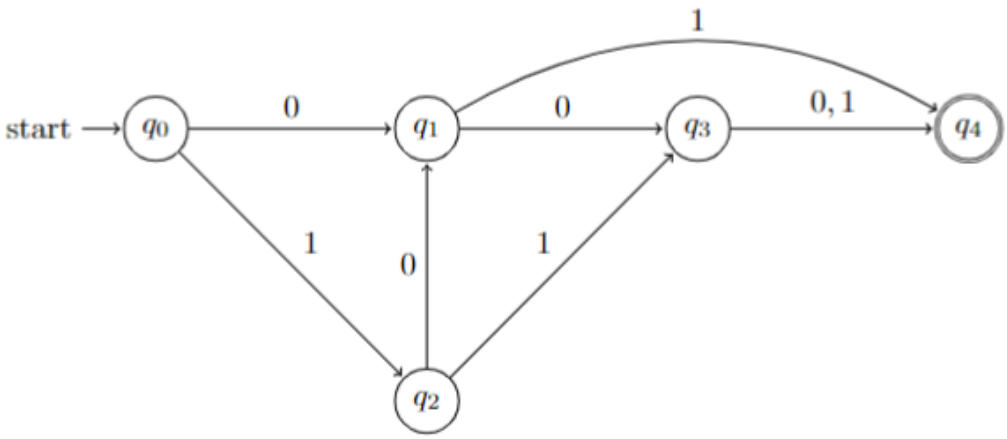
If all finite subsets of L are regular, then L is regular.

If a proper subset of L is not regular, then L is not regular.

Yes, the answer is correct.
Score: 1

Accepted Answers:
If all proper subsets of L are regular, then L is regular.

7) Cardinality of the language recognized by below NFA is? **1 point**



Infinite.

8.

9.

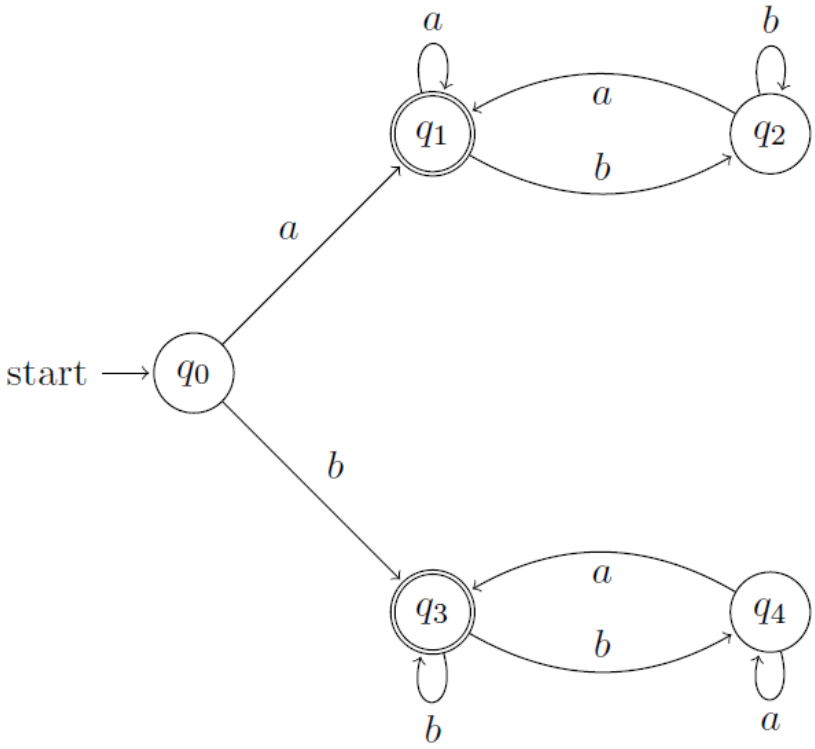
10.

Yes, the answer is correct.
Score: 1

Accepted Answers:

8.

8) Consider the following DFA : ***1 point***



Which of the following language is accepted by the DFA?

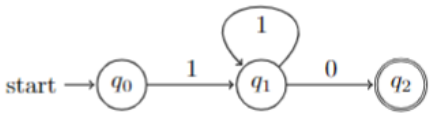
- Set of all nonempty strings containing either aa or bb.
- Set of all nonempty strings whose first and last character are the same.
- Set of all nonempty strings in which characters alternate between a and b.
- Set of all nonempty strings containing either ab or ba.

No, the answer is incorrect.
Score: 0

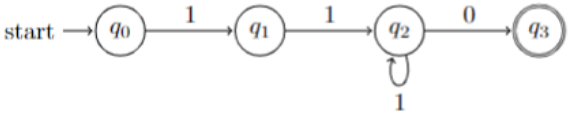
Accepted Answers:

Set of all nonempty strings whose first and last character are the same.

9) Consider the following two NFAs A_1 and A_2. ***1 point***



NFA A_1



NFA A_2

Which one of the following is true?

- Any string accepted by A_1 is also accepted by A_2.
- Any string accepted by A_2 is also accepted by A_1.
- Both A and B.
- None of the above.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Any string accepted by A_2 is also accepted by A_1.

10) If $L = \{ab, aa, baa\}$, which of the following strings is **not** in L^*? ***1 point***

- abaabaaabaa.
- aaaabaaaa.
- baaaaabaaaab.
- baaaaabaa.

Yes, the answer is correct.
Score: 1

Accepted Answers:
baaaaabaaaab.