

# 18 Lecture - CS402

## Important Mcqs

1. Which of the following is true regarding the concatenation of finite automata (FAs)?

- a) The concatenation of FAs always results in a DFA.
- b) The concatenation of FAs always results in an NFA.
- c) The concatenation of FAs may result in either an NFA or a DFA.
- d) The concatenation of FAs cannot be performed.

Answer: c

What is the purpose of concatenating FAs?

- a) To create an NFA from a DFA.
- b) To recognize a language consisting of all possible concatenations of strings recognized by the original FAs.
- c) To minimize the number of states in an FA.
- d) To convert an NFA to a DFA.

Answer: b

Can the concatenation of NFAs be performed directly without converting them to DFAs?

- a) Yes, it is always possible to concatenate NFAs directly.
- b) No, NFAs must be converted to DFAs before concatenation can be performed.
- c) It depends on the specific NFAs being concatenated.
- d) None of the above.

Answer: b

Which of the following is true regarding the powerset construction?

- a) It is a method for converting NFAs to regular expressions.
- b) It is a method for converting DFAs to NFAs.
- c) It is a method for converting NFAs to DFAs.
- d) It is a method for minimizing the number of states in an FA.

Answer: c

Which of the following is not a fundamental operation in the theory of regular languages and automata?

- a) Concatenation.
- b) Union.
- c) Intersection.
- d) Subtraction.

Answer: d

If FA1 recognizes the language L1 and FA2 recognizes the language L2, what language does the concatenation of FA1 and FA2 recognize?

- a) L1 - L2.
- b) L1 ? L2.
- c) L1 U L2.
- d) L1L2.

Answer: d

Can the concatenation of FAs increase the number of states in the resulting FA?

- a) Yes, the number of states in the resulting FA is always greater than or equal to the sum of the

number of states in the original FAs.

b) No, the number of states in the resulting FA is always less than or equal to the sum of the number of states in the original FAs.

c) It depends on the specific FAs being concatenated.

d) None of the above.

**Answer: a**

**Which of the following is not an advantage of using NFAs over DFAs?**

a) NFAs are more compact than DFAs.

b) NFAs can recognize a larger class of languages than DFAs.

c) NFAs can be converted to regular expressions more easily than DFAs.

d) All of the above are advantages of using NFAs over DFAs.

**Answer: c**

**What is the purpose of the power set construction in the context of automata theory?**

a) To convert NFAs to DFAs.

b) To convert DFAs to regular expressions.

c) To minimize the number of states in an FA.

d) To recognize a language consisting of all possible concatenations of strings.

**Answer: a**

**Which of the following is true regarding the pumping lemma?**

a) It is a tool used to prove that a language is regular.

b) It states that for any regular language  $L$ , there exists a pumping length  $p$  such that any string  $s$  in  $L$  of length greater than or equal to  $p$  can be split into three parts,  $s = xyz$ .

c) It is used to convert NFAs to DFAs.

d) None of the above.

**Answer**