

16 Lecture - CS402

Important Mcqs

What is the purpose of null transitions in an NFA?

- A. To consume input symbols
- B. To transition to a new state without consuming any input
- C. To reject input strings
- D. None of the above

Solution: B

Which of the following statements is true about null transitions in an NFA?

- A. Null transitions can be followed by any symbol
- B. Null transitions can only be followed by null symbols
- C. Null transitions are not allowed in an NFA
- D. None of the above

Solution: A

Which of the following is an example of an NFA with null transitions?

- A. DFA
- B. PDA
- C. Turing machine
- D. ϵ -NFA

Solution: D

Which of the following is a valid regular expression for the language that consists of all strings over {0, 1} that contain the substring 01?

- A. 01^*

- B. 10
- C. $(0+1)01(0+1)$
- D. $(0+1)^*$

Solution: C

Which of the following is true about the closure under concatenation of the class of regular languages?

- A. The concatenation of two regular languages is always a regular language
- B. The concatenation of two regular languages is not necessarily a regular language
- C. The concatenation of two regular languages is always a context-free language
- D. None of the above

Solution: A

Which of the following is true about the closure under union of the class of regular languages?

- A. The union of two regular languages is always a regular language
- B. The union of two regular languages is not necessarily a regular language
- C. The union of two regular languages is always a context-free language
- D. None of the above

Solution: A

Which of the following is an example of a language that can be recognized by an NFA with null transitions but cannot be recognized by a DFA?

- A. $\{w \mid w \text{ contains an even number of 0's and an even number of 1's}\}$
- B. $\{w \mid w \text{ contains an odd number of 0's or an odd number of 1's}\}$
- C. $\{w \mid w \text{ is a palindrome}\}$
- D. $\{w \mid w \text{ contains the substring } 010\}$

Solution: D

Which of the following is an example of a language that can be recognized by a DFA but cannot be recognized by an NFA with null transitions?

- A. $\{w \mid w \text{ contains an even number of 0's}\}$

- B. $\{w \mid w \text{ contains an odd number of 1's}\}$
- C. $\{w \mid w \text{ is a palindrome}\}$
- D. $\{w \mid w \text{ contains the substring } 010\}$

Solution: A

Which of the following is true about the intersection of two regular languages?

- A. The intersection of two regular languages is always a regular language
- B. The intersection of two regular languages is not necessarily a regular language
- C. The intersection of two regular languages is always a context-free language
- D. None of the above

Solution: A

Which of the following is true about the complement of a regular language?

- A. The complement of a regular language is always a regular language
- B. The complement of a regular language is not necessarily a regular language
- C. The complement of a regular language is always a context-free language
- D. None of the above

Solution: A