

35 Lecture - CS402

Important Mcqs

1. **What is null production in a context-free grammar?**

- A) A production rule that generates a null string
- B) A production rule that generates a non-terminal symbol
- C) A production rule that generates a terminal symbol
- D) A production rule that generates a regular expression

Answer: A

What is the purpose of using null productions in a context-free grammar?

- A) To simplify the grammar by eliminating the need for additional productions
- B) To make the grammar more complex
- C) To increase the number of derivations for a given string
- D) To make the grammar more ambiguous

Answer: A

Which of the following is an example of a null production?

- A) $A \rightarrow aB$
- B) $B \rightarrow ?$
- C) $S \rightarrow AB$
- D) $S \rightarrow aSb$

Answer: B

What is the effect of a null production on the parse tree of a string?

- A) It adds a new subtree to the parse tree
- B) It removes a subtree from the parse tree
- C) It does not affect the parse tree
- D) It can lead to multiple parse trees for a given string

Answer: B

Can a context-free grammar have multiple null productions?

- A) Yes
- B) No

Answer: A

What is the relationship between null productions and the language generated by a context-free grammar?

- A) Null productions do not affect the language generated by a grammar
- B) Null productions can change the language generated by a grammar
- C) Null productions can only be used in regular languages
- D) Null productions are used to generate infinite languages

Answer: B

Which of the following is an example of a context-free grammar with null productions?

$S \rightarrow AB \mid ?$

A) a

B) $bB \mid ?$

A) $\{ a^n b^n c^m \mid n, m \geq 0, 1 \leq n \leq m \}$

B) $\{ a^n b^n c^n \mid n \geq 0 \}$

C) $\{ a^n b^m c^n \mid n, m \geq 0 \}$

D) $\{ w \in \{ a, b \}^* \mid n_a(w) = n_b(w) \}$

Answer: C

What is the difference between a null production and an empty string in a context-free grammar?

A) There is no difference between null production and empty string

B) Null production is a rule used in the derivation of a string, while an empty string is a string itself

C) An empty string is a non-terminal symbol, while null production is a terminal symbol

D) An empty string can only be used in regular grammars

Answer: B

How can ambiguity be introduced in a context-free grammar by using null productions?

A) By adding multiple null productions for the same non-terminal symbol

B) By adding null productions for all non-terminal symbols in the grammar

C) By using null productions in the production rules of a regular language

D) By removing null productions from the grammar

Answer: A

Which of the following statements is true about the Chomsky Normal Form (CNF) of a context-free grammar?

A) The CNF does not allow null productions

B) The CNF allows only null productions

C) The CNF allows both null and unit productions

D) The CNF only allows unit productions

Answer: A