Problem

Show that every DCFG is an unambiguous CFG.

Step-by-step solution

Step 1 of 1

An **ambiguous grammar** is defined as "**a context free grammar** for which there subsists a string and that string may contains greater than one left-most derivation. **An unambiguous grammar** is defined as "a **context free grammar** for which all **justifiable string** has an individual leftmost derivation.

• As context free grammar (CFG's) is proper superset of deterministic context-free grammars (DCFG's). It can be derived from deterministic finite automata and it can be used to generate deterministic context free language.

• DCFG's (deterministic context-free grammars) are always shows an unambiguous behavior and an unambiguous context free grammar (CFG's) is an important super class of DCFG's.

The above statement can be proved by the following way:

• As it is known that **for every pushed down automata** M **there exist an equivalent context free grammar** G**.**

Therefore, M **Recognizes** $L\$ \Rightarrow$ G **generates** $L\$$. But, M **deterministic** $\Rightarrow$ G **is an unambiguous**. Hence, **replacing** $\$$ **by** ε **in** $G \Rightarrow G$ **generates** L.

• Thus**,** from the above explanation it can be said that **every DCFG is an unambiguous CFG.**

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