1. **Create a program in python to check for agreement in sentences based on a context-free grammar’s rules.**

**Aim:**

To create a program in python to check for agreement in sentences based on a context-free grammar’s rules.

**Code:**

import nltk

from nltk import CFG

def check\_sentence\_agreement(sentence, user\_grammar):

grammar = CFG.fromstring(user\_grammar)

parser = nltk.ChartParser(grammar)

tokens = sentence.split() # Preserve case

try:

for tree in parser.parse(tokens):

print("Valid sentence according to grammar!")

tree.pretty\_print()

return

print("Invalid sentence based on the given grammar.")

except ValueError:

print("Invalid sentence structure.")

if \_\_name\_\_ == "\_\_main\_\_":

print("Enter grammar rules (end input with an empty line):")

user\_grammar\_lines = []

while True:

line = input()

if line.strip() == "":

break

user\_grammar\_lines.append(line)

user\_grammar = "\n".join(user\_grammar\_lines)

sentence = input("Enter a sentence: ")

check\_sentence\_agreement(sentence, user\_grammar)

**Input:**

Enter grammar rules (end input with an empty line):

S -> NP VP

NP -> Det N | Det Adj N | PropN

VP -> V NP | V

Det -> 'the' | 'a'

N -> 'dog' | 'cat' | 'ball'

Adj -> 'big' | 'small'

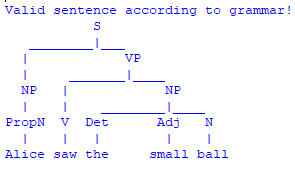
PropN -> 'Alice' | 'Bob'

V -> 'chased' | 'saw' | 'barked'

Enter a sentence: Alice saw the small ball

**Output:**

Valid sentence according to grammar!

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