Semester : _____   Subject : _____   Academic Year: 20___ - 20___

Context Free Grammar (CFG)

→ In a language, when there are well formed sentences, the rules behind making these sentences well-formed is called CFG (Context Free Grammar). / Or the rule list is called CFG

→ If a rule is picked, & it is read from left to right then on the

Based on Numbers {
  L.H.S. ⇒ Syntactic category

  R.H.S ⇒ has alternative component parts defined.
}

→ It has 3 major things :-
  i) Constituency
  ii) Grammatical relations
  iii) Subcategorizations & relations.

  i] Constituencies.
If One word /one unit, ~~behaves~~ multiple words behaves like one / unit or one phrase, then it is called to be constituent.

PARSHWANATH CHARITABLE TRUST'S
A.P. SHAH INSTITUTE OF TECHNOLOGY
Department of Computer Science and Engineering
Data Science

CSE DATA SCIENCE

Ojas → noun phrase.

Russian Hill → noun phrase.

(ii) Grammatical relations

→ It is used to find out subject & object in a ~~relation~~ sentence.

eg

<u>She</u> ate <u>a mammoth breakfast</u>
Subject   Object.

iii) Subcategorizations & relations

→ Words or phrases are referred with them.

    I want   Miami

f Infinitive phrase/ Verb phrase is needed,

                  verb

    I want   <u>to fly to</u>   Miami
                    VP

If,
NPhrase is needed

    I want <u>a flight to</u>   Miami
                NP

    I find <u>(to fly to)</u>   Miami
           Infinitive ph. reqd.

PARSHWANATH CHARITABLE TRUST'S
A.P. SHAH INSTITUTE OF TECHNOLOGY
Department of Computer Science and Engineering
Data Science

CSE DATA SCIENCE

Semester : _____   Subject : _____   Academic Year: 20   - 20

→ Here one words depends on another, words should fit in the sentence otherwise they wont be grammatically correct.

→ CFG is a backbone of syntax.

Numerical

Construct a parse tree for the following sentence using CFG rules:

" The man read this book ".

Rules :-   S → NP   VP
           S → Aux   NP   VP

S → VP   NP → Det NOM

NOM → Noun   VP → Verb NP

NOM → Noun   NOM

Det → that | this | a | the

Noun → book | flight | meal | man

Verb → book | include | read.

Aux → does.
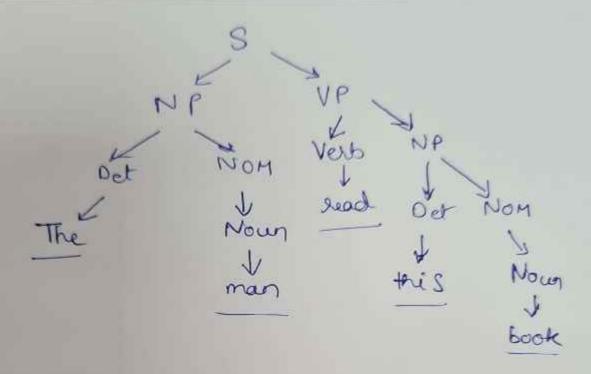
PARSHWANATH CHARITABLE TRUST'S
A.P. SHAH INSTITUTE OF TECHNOLOGY
Department of Computer Science and Engineering
Data Science

CSE DATA SCIENCE

A parse tree for the sentence "The man read this book":

- S
  - NP
    - Det → The
    - NOM → Noun → man
  - VP
    - Verb → read
    - NP
      - Det → this
      - NOM → Noun → book

Note:- It may happen that rules can be wrongly utilized & we need to backtrack, so then backtracking can also be done.