Context Free Grammars

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Continued

G = (V, Σ, R, S) where - - V a finite set called the set of variables - Σ a finite set of characters - S ∈ V start variables - R is a set of rules A → string of variables and/or letters from Σ

Rules

supp. rule A → 0A1 And if $w1 = 01A11 \implies w2 = 010A111$ where w2 is derived from w1.

Also,

$w1 \implies w2 \implies w3 \implies w4 \implies ... \implies wn$

Then $w1 =^* \implies wn$

Given a CFG G(= (V,Σ,R,S)), then the language generated by it is LG = { w | w∈Σ and S $\implies$ w }

Example

In the previous case of the Grammar of arithmetic over add and sub, - Σ was {0...9, (,), +, -} - V was {E, N} - R was - E → E+E | E-E | (E) | N - N → 0 | ... | 9 | NN - S = E

Parse Tree

Stack

FILO - First in Last out. You push into the stack, but you must pop out the last element only.
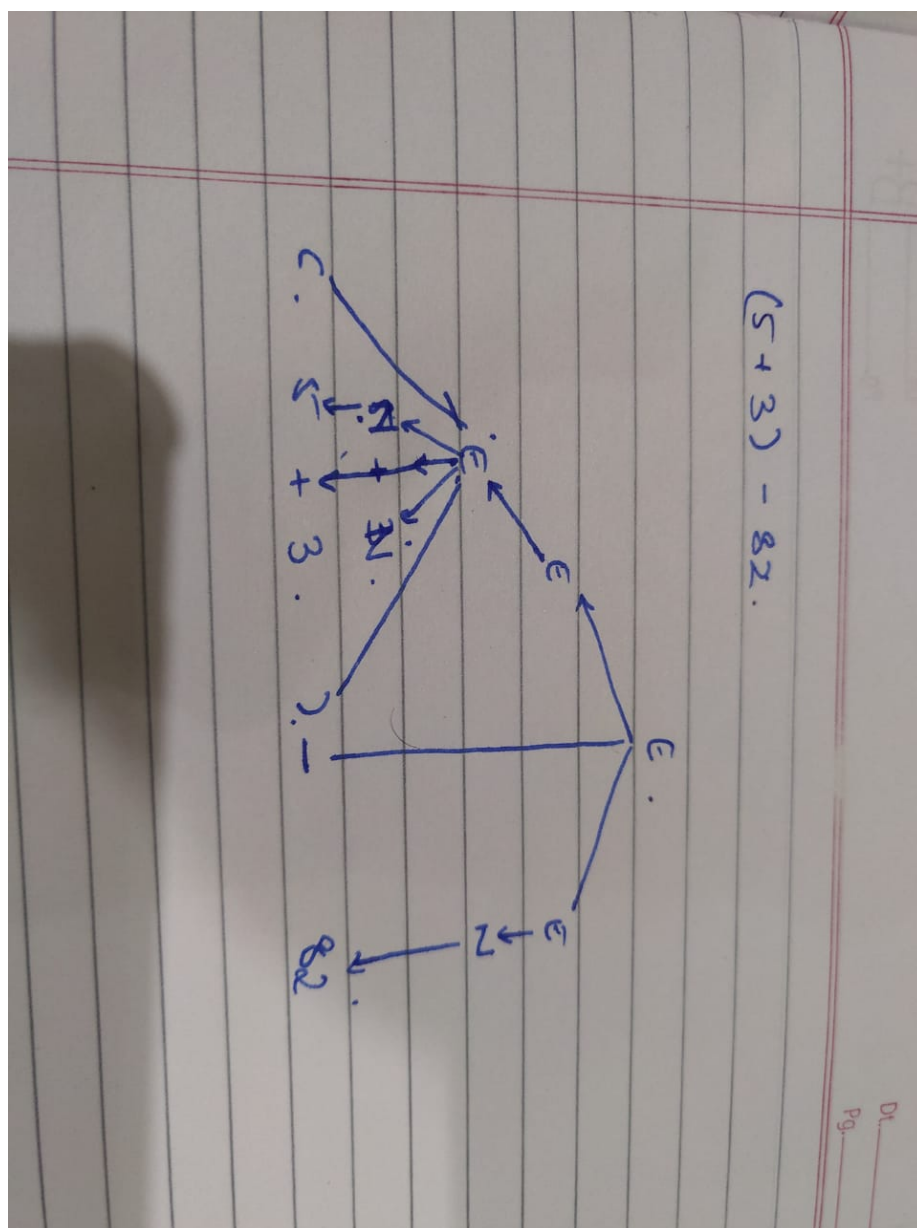
Figure 1: parsetree.jpg

Parse to check if Expr.

Let St be a St.

1. Push E to St
2. Pop