

WorkSheet Problems

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Task 1 BNF?

First and foremost BNF stands for Backus Naur Form Computing. BNF languages are basic languages that allow for rules and reasons to be created and traversed through. BNF programming is important to know because it serves as the baseline and foundations for nearly all programming languages. It helps people understand the if this happens then this happens and forces users to find creative ways to make outputs using the limited BNF language.

Task 2: BNF Description of L1

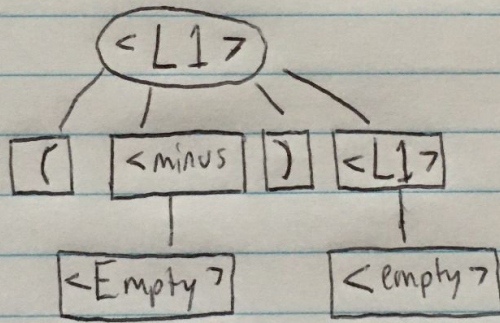
$\langle L1 \rangle ::= (\langle minus \rangle) \langle L1 \rangle \mid (\langle plus \rangle) \langle L1 \rangle \mid \langle empty \rangle$

$\langle minus \rangle ::= - \langle minus \rangle \mid \langle empty \rangle$

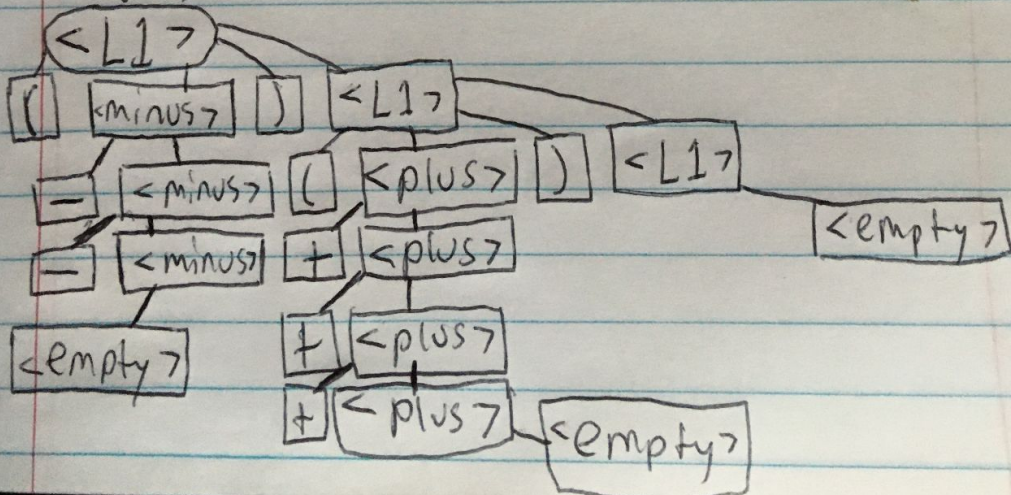
$\langle plus \rangle ::= + \langle plus \rangle \mid \langle empty \rangle$

Task 3: Parse Tree for L1

1. ()



2. (--)(+++)



Task 4 - BNF Description of L2

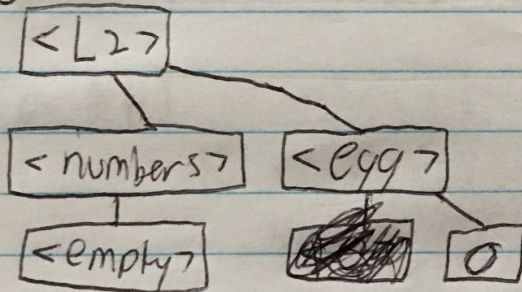
$\langle L2 \rangle ::= \langle \text{numbers} \rangle \langle \text{egg} \rangle$

$\langle \text{egg} \rangle ::= 0 \mid 0 \langle L2 \rangle \mid \langle L2 \rangle \mid \langle \text{empty} \rangle$

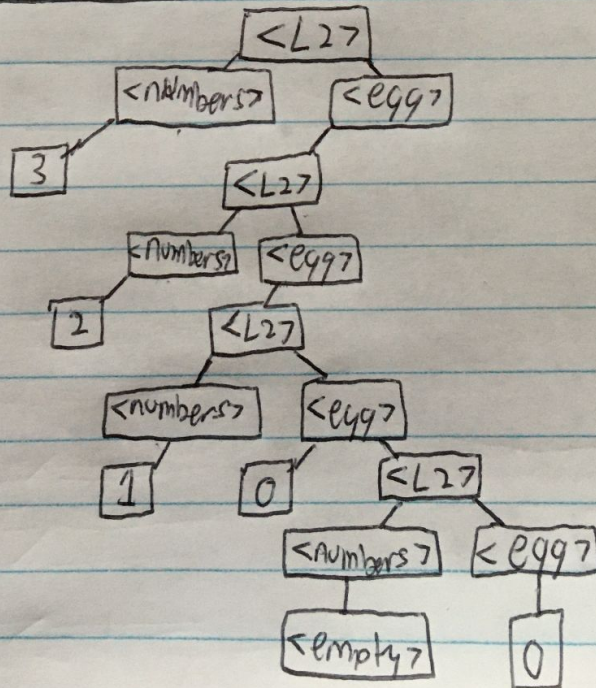
$\langle \text{numbers} \rangle ::= 1 \mid 2 \mid 3 \mid \langle \text{empty} \rangle$

Task 5 - Parse Trees for L2

1. 0



2. 32100



Task 6 - BNF Description of L3

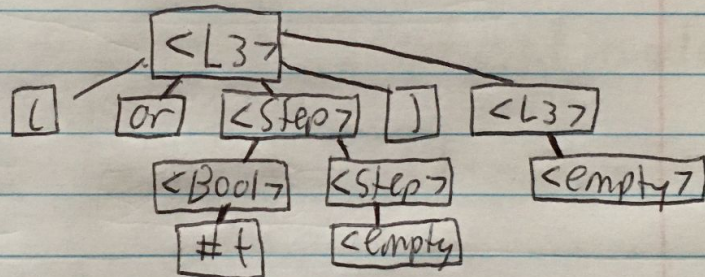
$\langle L3 \rangle ::= (\text{and} \langle \text{step} \rangle \langle L3 \rangle \mid (\text{or} \langle \text{step} \rangle \langle L3 \rangle \mid$
 $(\text{not} \langle \text{step} \rangle) \langle L3 \rangle \mid \langle \text{step} \rangle \langle \text{empty} \rangle$

$\langle \text{step} \rangle ::= \langle \text{Bool} \rangle \langle \text{step} \rangle \mid \langle L3 \rangle \langle \text{step} \rangle \mid \langle \text{empty} \rangle$

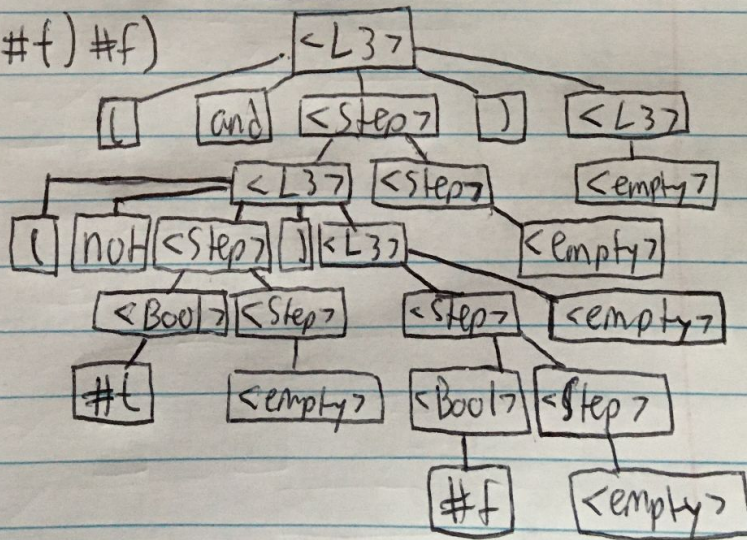
$\langle \text{Bool} \rangle ::= \#t \mid \#f \mid \langle \text{empty} \rangle$

Task 7 - Parse Trees for L3

1. (or #t)



2. (and (not #f) #f)



Task 8: BNF Description of LY

$\langle LY \rangle ::= \langle biggest \rangle \langle medium \rangle \langle small \rangle \langle combine \rangle$

$\langle smallest \rangle ::= \langle empty \rangle | one | two | three | four | five |$
 $six | seven | eight | nine$

$\langle combine \rangle ::= \langle empty \rangle | \langle medium \rangle | \langle prefix \rangle ty$

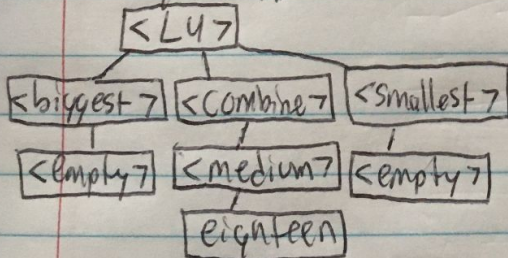
$\langle medium \rangle ::= \langle empty \rangle | ten | eleven | twelve | thirteen |$
 $fourteen | fifteen | sixteen | seventeen | eighteen |$
 $nineteen$

$\langle prefix \rangle ::= \langle empty \rangle | \langle smallest \rangle hundred | \langle empty \rangle$

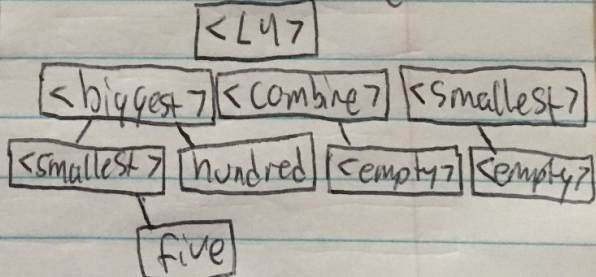
$\langle biggest \rangle ::= \langle smallest \rangle hundred | \langle empty \rangle$

Task 9: Parse trees for LY

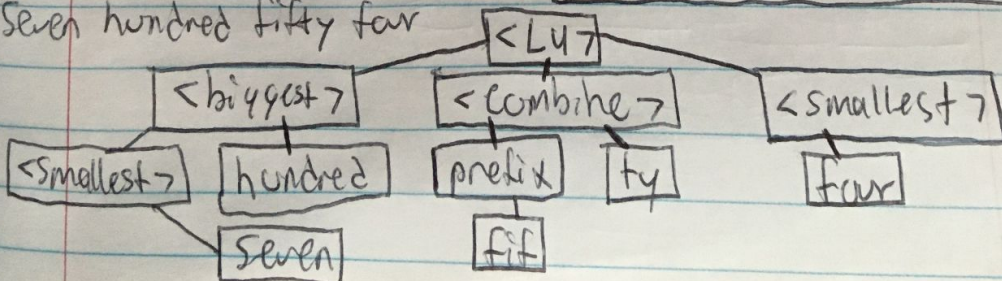
1. eighteen



2. five hundred



3. Seven hundred fifty four



Task 10 BNF Description of L5

~~Task 10 BNF Description of L5~~

$\langle L5 \rangle ::= \langle add \rangle | \langle describe \rangle | \langle show \rangle | \langle exit \rangle$
 $\langle add \rangle ::= \langle add \rangle (\langle n \rangle \langle n \rangle \langle n \rangle) \langle colours \rangle |$
 $\quad \langle add \rangle (\langle n \rangle \langle n \rangle \langle n \rangle \langle n \rangle) \langle colours \rangle |$
 $\quad (\langle n \rangle \langle n \rangle \langle n \rangle) \langle Colour N \rangle |$
 $\quad \langle add \rangle \langle colours \rangle \langle Colour N \rangle$
 $\langle n \rangle ::= 0 | 1 | 2 | 3 | \dots | 255$
 $\langle show \rangle ::= \langle show \rangle \langle all \rangle | \langle Colour N \rangle$
 $\langle describe \rangle ::= \langle colours \rangle | \langle Colour N \rangle$
 $\langle colours \rangle ::= \langle all \rangle \langle all \rangle | \langle Colour N \rangle \langle Colour N \rangle$
 $\quad \langle Colour N \rangle \langle all \rangle | \langle Colour N \rangle$
 $\quad \langle Colour N \rangle \langle Colour N \rangle \langle Colour N \rangle$
 $\quad \langle all \rangle \langle all \rangle$
 $\langle Colour N \rangle ::= \langle C1 \rangle | \langle C2 \rangle | \langle C3 \rangle | \dots | \langle C255 \rangle$
 $\langle exit \rangle ::= \langle Goodbye... \rangle$

Task 11 - Parse Trees for LS

- 1. Colours ~~add (100)~~
- 2. show purple ~~add (100)~~
- 3. add (100 220 170) (28)

