

1.

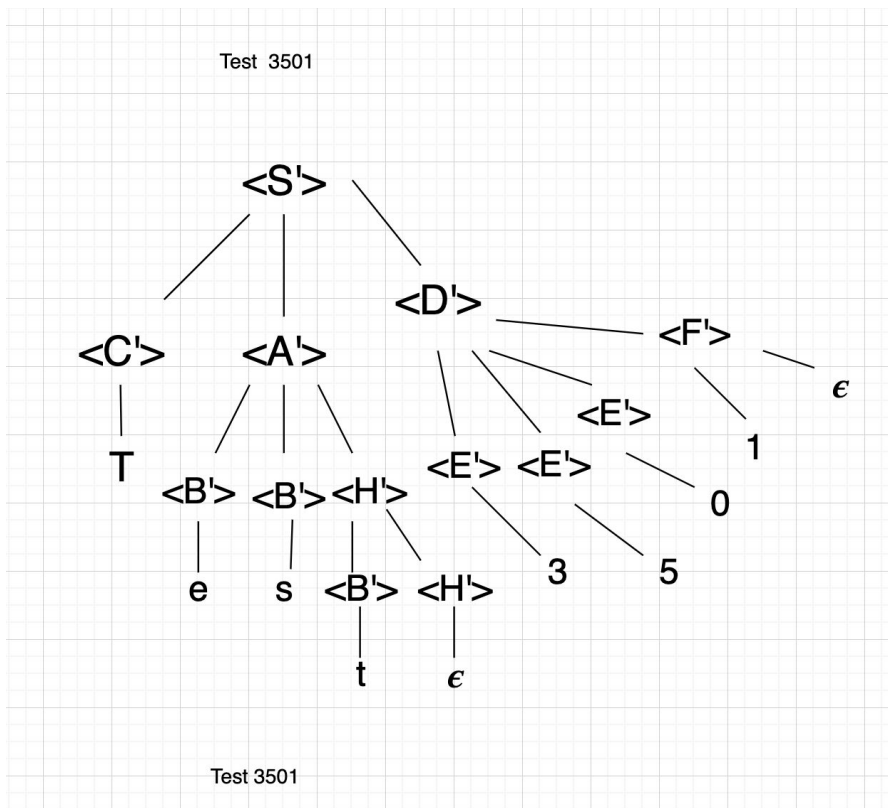
a) Grammar

$\langle S' \rangle \rightarrow \langle C' \rangle \langle A' \rangle \langle D' \rangle$
 $\langle C' \rangle \rightarrow A|B|C|D|E|F \dots X|Y|Z$
 $\langle A' \rangle \rightarrow \langle B' \rangle \langle B' \rangle \langle H' \rangle$
 $\langle H' \rangle \rightarrow \langle B' \rangle \langle H' \rangle \mid \epsilon$
 $\langle B' \rangle \rightarrow a|b|c|d|e|f|g| \dots x|y|z$
 $\langle D' \rangle \rightarrow \langle E' \rangle \langle E' \rangle \langle E' \rangle \langle F' \rangle$
 $\langle F' \rangle \rightarrow \langle E' \rangle \langle F' \rangle \mid \epsilon$
 $\langle E' \rangle \rightarrow o|1|2|3|4|5|6|7|8|9$

Terminals = { A,B,C,...X,Y,Z,a,b,c,...x,y,z,0,1,2,...9}

Variables = {S',C',A',H',B',D',E',F'}

b)



2.

$\langle \text{assign} \rangle \rightarrow \langle \text{var} \rangle = \langle \text{exp} \rangle$

$\langle \text{var} \rangle \text{ type} = \text{int} : \langle \text{expr} \rangle \text{ type} = \text{int}$

$\langle \text{var} \rangle \text{ type} = \text{float} : \langle \text{expr} \rangle \text{ type} = \text{int} / \text{float}$

$\langle \text{expr} \rangle \rightarrow \langle \text{var} \rangle + \langle \text{var} \rangle$

$\langle \text{expr} \rangle \text{ type} = \text{int} \rightarrow \langle \text{var} \rangle \text{ type} = \text{int} + \langle \text{var} \rangle \text{ type} = \text{float} / \text{int}$

$\langle \text{expr} \rangle \text{ type} = \text{float} \rightarrow \langle \text{var} \rangle \text{ type} = \text{float} + \langle \text{var} \rangle \text{ type} = \text{int} / \text{float}$

$\langle \text{expr} \rangle \rightarrow \langle \text{var} \rangle - \langle \text{var} \rangle$

$\langle \text{expr} \rangle \text{ type} = \text{int} \rightarrow \langle \text{var} \rangle \text{ type} = \text{int} - \langle \text{var} \rangle \text{ type} = \text{float} / \text{int}$

$\langle \text{expr} \rangle \text{ type} = \text{float} \rightarrow \langle \text{var} \rangle \text{ type} = \text{float} - \langle \text{var} \rangle \text{ type} = \text{int} / \text{float}$

$\langle \text{expr} \rangle \rightarrow \langle \text{var} \rangle$

$\langle \text{expr} \rangle \text{ type} = \text{int} \rightarrow \langle \text{var} \rangle \text{ type} = \text{int}$

$\langle \text{expr} \rangle \text{ type} = \text{float} \rightarrow \langle \text{var} \rangle \text{ type} = \text{float/int}$

$\langle \text{var} \rangle \rightarrow A|B|C$

$\langle \text{var} \rangle \text{ type} = \text{int} \rightarrow A \text{ type} = \text{int} \mid B \text{ type} = \text{int} \mid C \text{ type} = \text{int}$

$\langle \text{var} \rangle \text{ type} = \text{float} \rightarrow A \text{ type} = \text{float} \mid B \text{ type} = \text{float} \mid C \text{ type} = \text{float}$