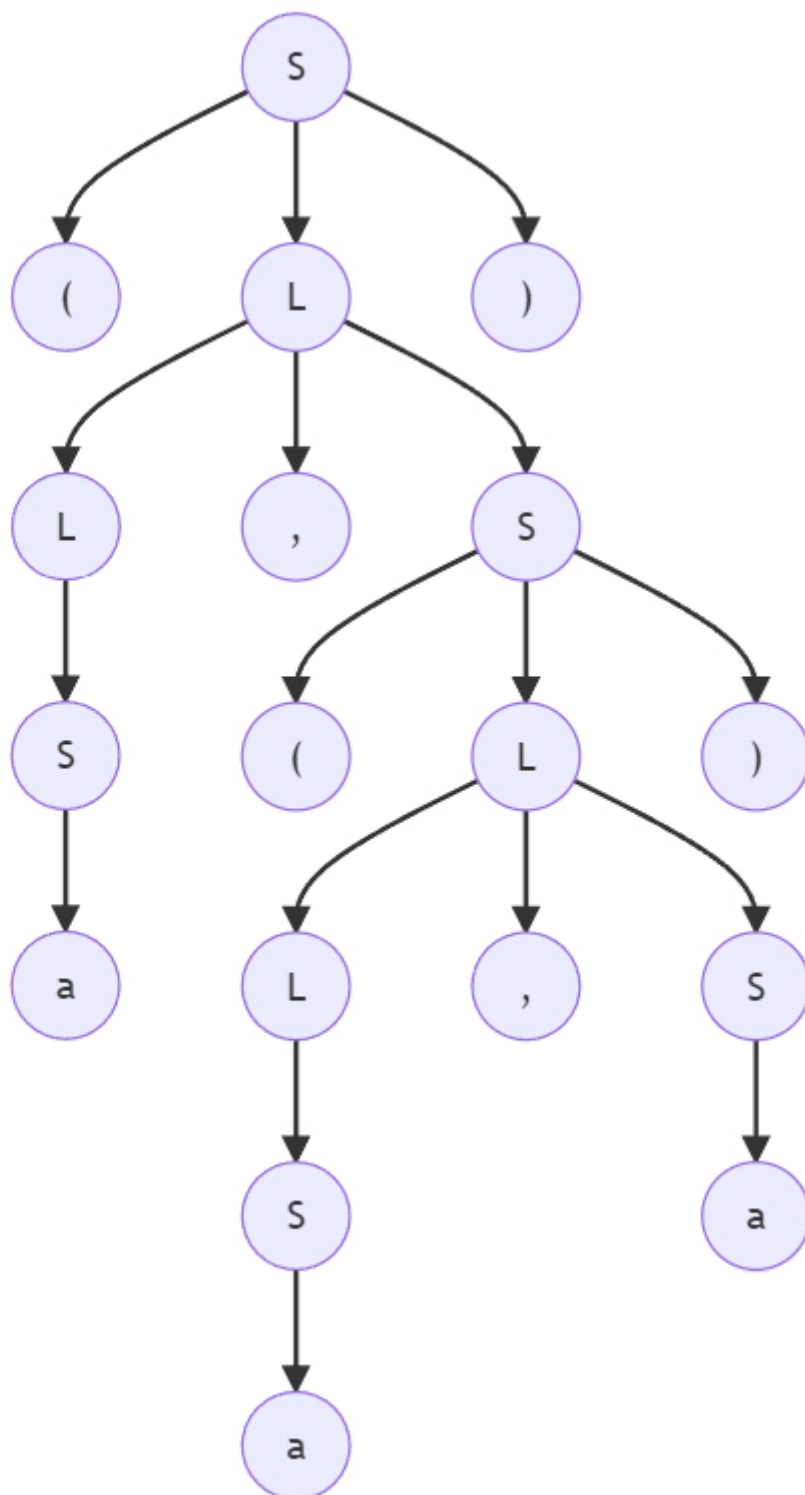


3.1-a

1. (a,(a,a))



2. (a,((a,a),(a,a)))

$S \rightarrow (L) \rightarrow (L, S) \rightarrow (L, (L)) \rightarrow (L, (L, S)) \rightarrow (L, (L, (L))) \rightarrow (L, (L, (L, S))) \rightarrow (L, (L, (L, a))) \rightarrow (L, (L, (S, a))) \rightarrow (L, (L, (a, a))) \rightarrow (L, (S, (a, a))) \rightarrow (L, ((L), (a, a))) \rightarrow (L, ((L, S), (a, a))) \rightarrow (L, ((L, a), (a, a))) \rightarrow (L, ((S, a), (a, a))) \rightarrow (L, ((a, a), (a, a))) \rightarrow (S, ((a, a), (a, a))) \rightarrow (a, ((a, a), (a, a)))$

3.2-a

$S \rightarrow aSbS \rightarrow abSaSbS \rightarrow abaSbS \rightarrow ababS \rightarrow abab$
 $S \rightarrow aSbS \rightarrow abS \rightarrow abaSbS \rightarrow ababS \rightarrow abab$

3.3

$S \rightarrow \text{not } T \mid T$
 $T \rightarrow F \text{ and } F \mid F$
 $F \rightarrow L \text{ or } L \mid L$
 $L \rightarrow \text{true} \mid \text{false} \mid (S)$