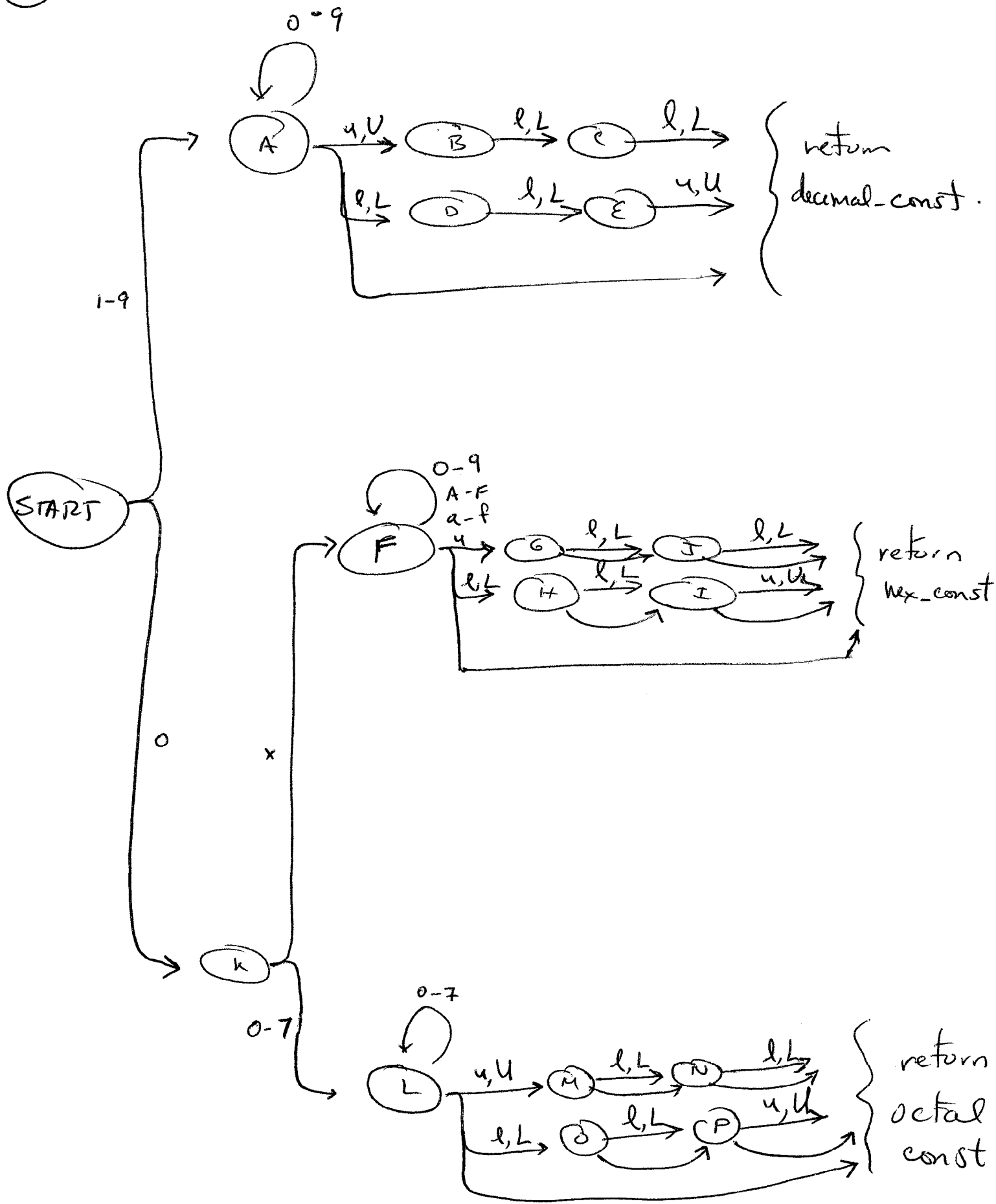
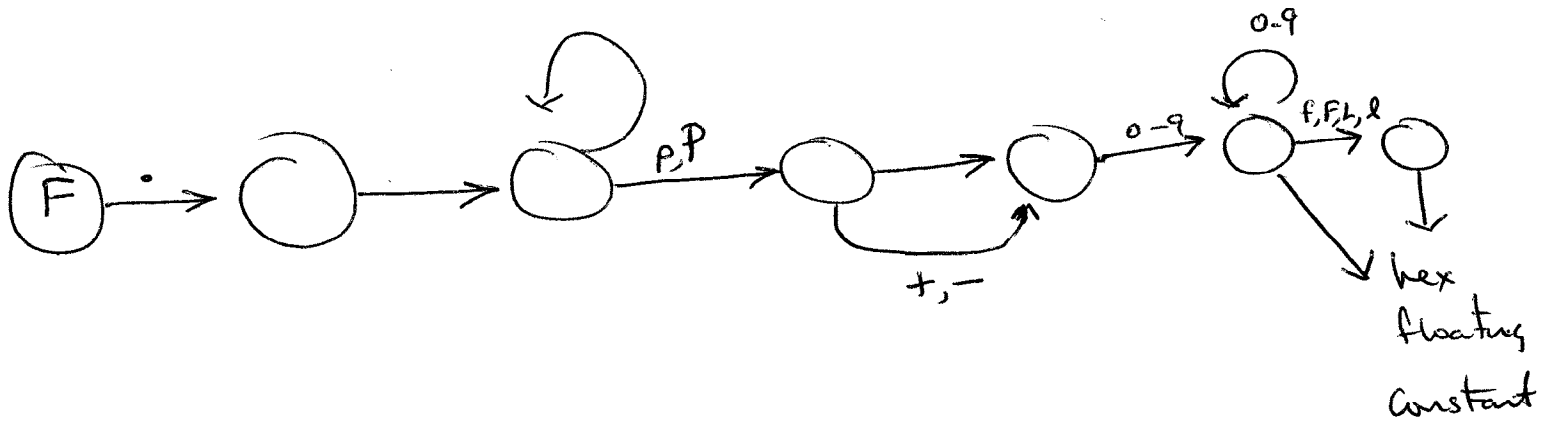
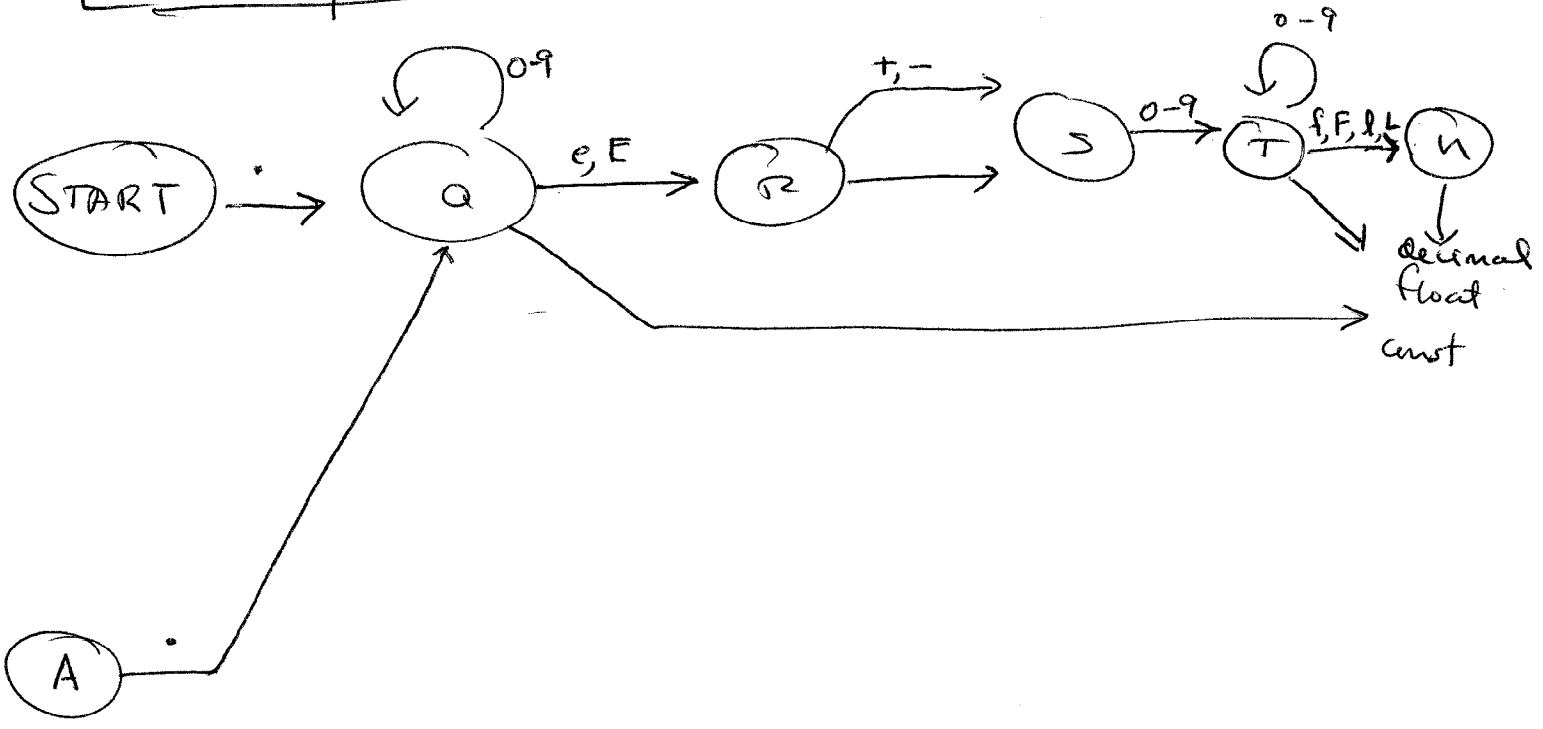


ANSI C Integer Literals

①



To accommodate floating constants add the following:



② (a) The grammar's ambiguity can be proven by finding an example of a sentence generated by the grammar in two or more distinct derivations (parse trees)

Consider the statement

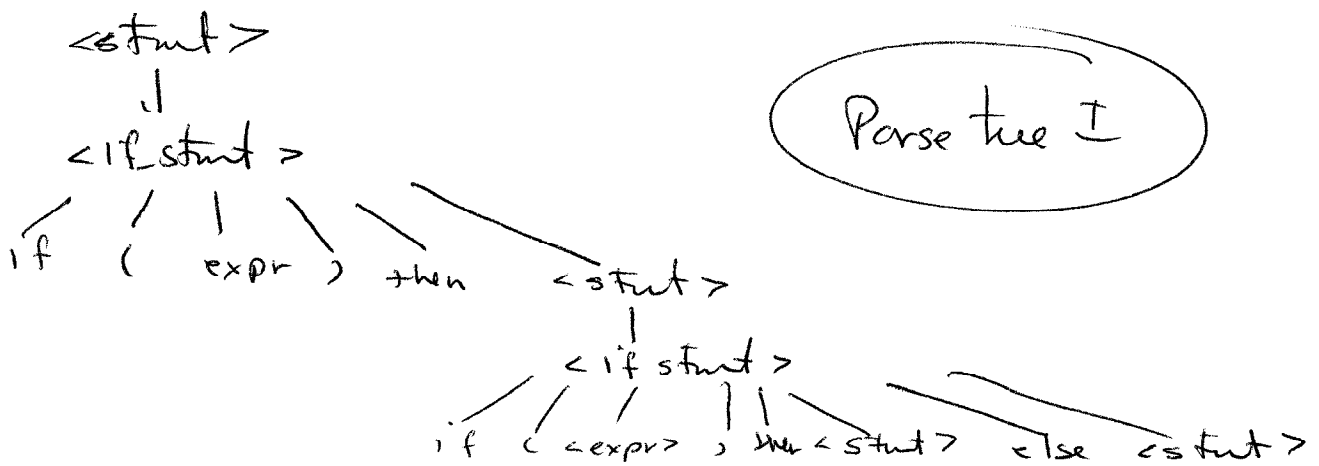
if ($\langle \text{expr} \rangle$) then

if ($\langle \text{expr} \rangle$) then $\langle \text{stmt} \rangle$

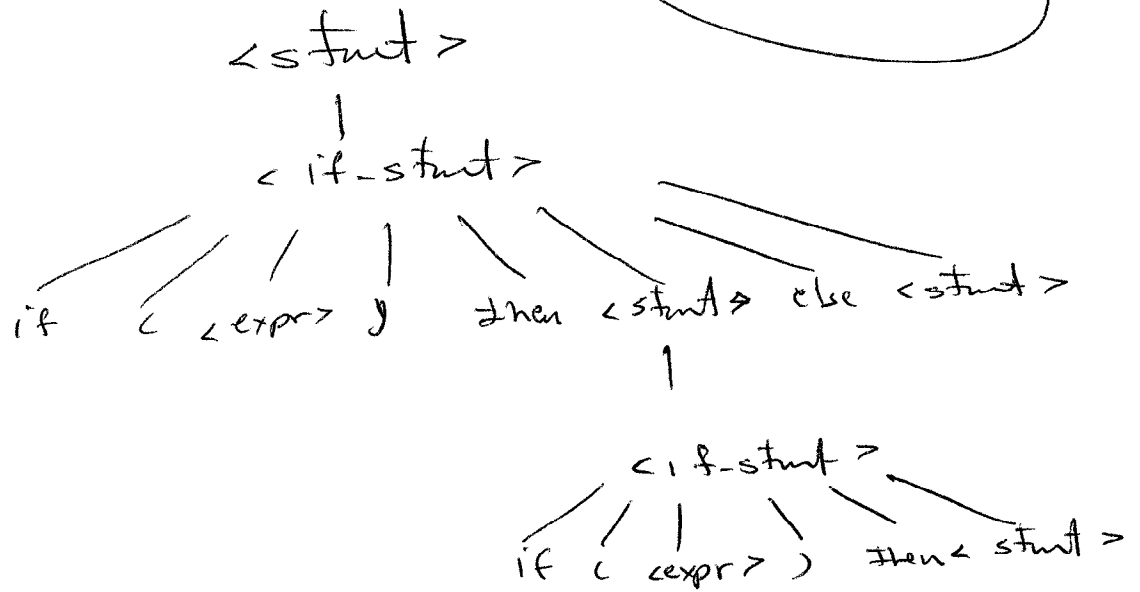
else

$\langle \text{stmt} \rangle$

The following distinct parse trees are generated by the grammar



Parse tree II



This well known ambiguity is commonly called the dangling else problem. PASCAL ^(and virtually all PL's) resolves the ambiguity by associating the "else" with the closest unmatched "then". Therefore, these languages prefer parse tree I.

We now provide a new grammar that only allows parse tree I.

stmt \rightarrow balanced_stmt
| unbalanced_stmt

balanced_stmt \rightarrow if (<expr>) then <balanced_stmt> else <balanced_stmt>
| block
| ...

unbalanced_stmt \rightarrow if (<expr>) then <stmt>

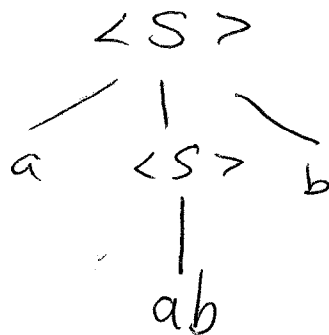
| if (<expr>) then <balanced_stmt>
else <unbalanced_stmt>

③ Sebesta 3.13

~~(a)~~ $\langle S \rangle \rightarrow a \langle S \rangle b \mid ab$

④ Sebesta 3.14

(a) Parse tree for aabb



(b) Parse tree for aaaaabbbb

