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Lab 3

Crafting a Compiler

4.7a

Start
E $
T plus E $
F plus E $
num plus E $
num plus T plus E $
num plus T times F plus E $
num plus F times F plus E $
num plus num times F plus E $
num plus num times num plus E $
num plus num times num plus T $
num plus num times num plus F $
num plus num times num plus num $

4.7b

Start
E $
T plus E $
T plus T plus E $
T plus T plus T $
T plus T plus F $
T plus T plus num $
T plus T times F plus num $
T plus T times num plus num $
T plus num times num plus num $
num plus num times num plus num $

4.7c

Times is left hand associative and takes precedence over addition which is right hand associative.

5.2c

```
procedure Start()
  switch(...)
    case ts.peek() in {num, lparen}
      call Value()
end

procedure Value()
  switch(...)
    case ts.peek() in {num}
      match(num)
    case ts.peek() in {lparen}
      match(lparen)
      call Expr()
      match(rparen)
end

procedure Expr()
  switch(...)
    case ts.peek() in {plus}
      match(plus)
      call Value()
      call Value()
    case ts.peek() in {prod}
      match(prod)
      call Values()
end

procedure Values()
  switch(...)
    case ts.peek() in {Value}
      match(Value)
      call Values()
    case ts.peek() in {rparen}
      return()
end
```

Dragon

4.2.1a

S
$S\,S\,*$
$S\,S + S\,*$
$a\,S + S\,*$
$a\,a + S\,*$
$a\,a + a\,*$

4.2.1b

S
S S *
S S + S *
S S + a *
S a + a *
a a + a *

4.2.1c