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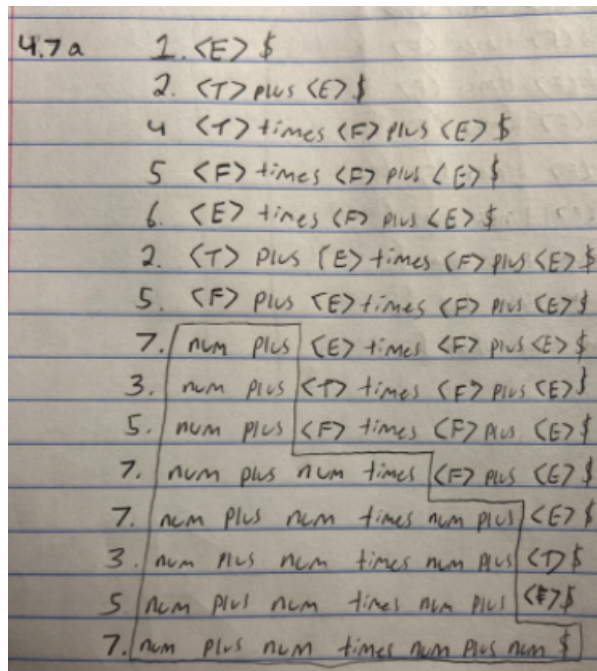
March 10, 2022

Objective: This Lab we have a few tasks to accomplish. We must reach chapters 4.1-4.4, 5.1-5.3, and 7.1 in the Crafting a Compiler book as well as reading chapters 2.7, 2.8.2, 4.2, 4.4.1, and 5.3.1 in the Dragon book. We then must complete exercises 4.7 and 5.2c from the Crafting a Compilers book. We must also complete exercise 4.2.1 a, b, and c from the Dragon book.

1 Crafting a Compiler

This section contains the assignments from the Crafting a Compiler book

1.1 4.7



4.7b	num times num plus num times num
1.	$\langle E \rangle \$$
3.	$\langle T \rangle \$$
4.	$\langle T \rangle$ times $\langle F \rangle \$$
5.	$\langle F \rangle$ times $\langle F \rangle \$$
6.	$\langle E \rangle$ times $\langle F \rangle \$$
2.	$\langle E \rangle \langle T \rangle \text{ plus } \langle E \rangle \text{ times } \langle F \rangle \$$
3.	$\langle T \rangle \text{ plus } \langle T \rangle \text{ times } \langle F \rangle \$$
5.	$\langle F \rangle \text{ plus } \langle F \rangle \text{ times } \langle F \rangle \$$
6.	$\langle E \rangle \text{ plus } \langle F \rangle \text{ times } \langle F \rangle \$$
3.	$\langle T \rangle \text{ plus } \langle F \rangle \text{ times } \langle F \rangle \$$
4.	$\langle T \rangle \text{ times } \langle F \rangle \text{ plus } \langle F \rangle \text{ times } \langle F \rangle \$$
5.	$\langle F \rangle \text{ times } \langle F \rangle \text{ plus } \langle F \rangle \text{ times } \langle F \rangle \$$
7.	$\langle F \rangle \text{ times } \langle F \rangle \text{ plus } \langle F \rangle \text{ times num } \$$
7.	$\langle F \rangle \text{ times } \langle F \rangle \text{ plus num times num } \$$
7.	$\langle F \rangle \text{ times num plus num times num } \$$
7.	$\text{num times num plus num times num } \$$

4.7c

In this grammar, the productions terminate when reaching "num". This grammar also nests expressions that are separated by "plus" or "times".

1.2 5.2c

5.2c

1. Start \rightarrow Value \$
2. Value \rightarrow num
3. \rightarrow (paren Expr (paren
4. Expr \rightarrow plus Value Value
5. \rightarrow prod Values
6. Values \rightarrow Value Values
7. \rightarrow }

<pre> parseStart() { parseValue() match("\$") } </pre>	<pre> parseExpr() { if (plus) { match("+") parseValue() } else { parseValue() } } </pre>	<pre> parseValues() { if (value) { parseValue() parseValues() } else { // end, return } } </pre>
<pre> parseValue() { if (num) { match("num") } else { match("("paren) parseExpr() match(")paren") } } </pre>	<pre> } </pre>	<pre> } </pre>

2 Dragon

This section contains the assignments from the Dragon book

2.1 4.2.1

4.2.1a

	$\langle s \rangle$
	$\langle s \rangle \langle s \rangle *$
First of	$\langle s \rangle \langle s \rangle + \langle s \rangle *$
$a =$	$a \langle s \rangle + \langle s \rangle *$
$a = 2$	$a a + \langle s \rangle *$
	$a a + a *$

4.2.1b

$\langle s \rangle$	
$\langle s \rangle$	$\langle s \rangle *$
$\langle s \rangle$	$a *$
$\langle s \rangle \langle s \rangle$	$+ a *$
$\langle s \rangle$	$a + a *$
	$a a + a *$

