Lab 1: Introducing Scanning & Parsing by Creating a Validation Tool
CSC 4181, Compiler Construction, Dr. Tom Way

Due: February 1, 2018
Worth: 50 points total

This lab is designed to introduce you to the fundamentals of compiler construction, focusing on scanning and parsing. The lab is to be done either individually or in a team of two people.

Description

Using the JavaScript scanner and parser framework begun in the checker web page (see link on class Schedule page), implement a validation tool. The tool will validate a mathematical expression, as specified in the grammar below.

To accomplish this, you will save a local copy of the checker web page and modify the code in it. You will run your code in any browser in order to test and demonstrate it.

Evaluation

Evaluation will be done in-class on the due date noted above, when you will demonstrate your validator to the instructor or TA.

Grammar

\[
\begin{align*}
\text{exp} & \rightarrow \text{term} \ \text{addop} \ \text{exp} \ | \ \text{term} \\
\text{addop} & \rightarrow + \ | - \\
\text{term} & \rightarrow \text{factor} \ \text{mulop} \ \text{term} \ | \ \text{factor} \\
\text{mulop} & \rightarrow * \ | / \\
\text{factor} & \rightarrow ( \text{exp} ) \ | \ \text{number} \\
\text{number} & \rightarrow -\text{integer} \ | \ \text{integer} \\
\text{integer} & \rightarrow [0-9]\text{integer} \ | \ [0-9]
\end{align*}
\]

Grading criteria (50 points max for working validator)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Worth</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handles a variety of input and correctly analyzes input and reports either “accept” or “reject”</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Provides some reason or justification for the decision to “reject”</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Provides precision, such as line number or character number in the input along with the “reject” justification</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

Evaluation notes: