Assignment One

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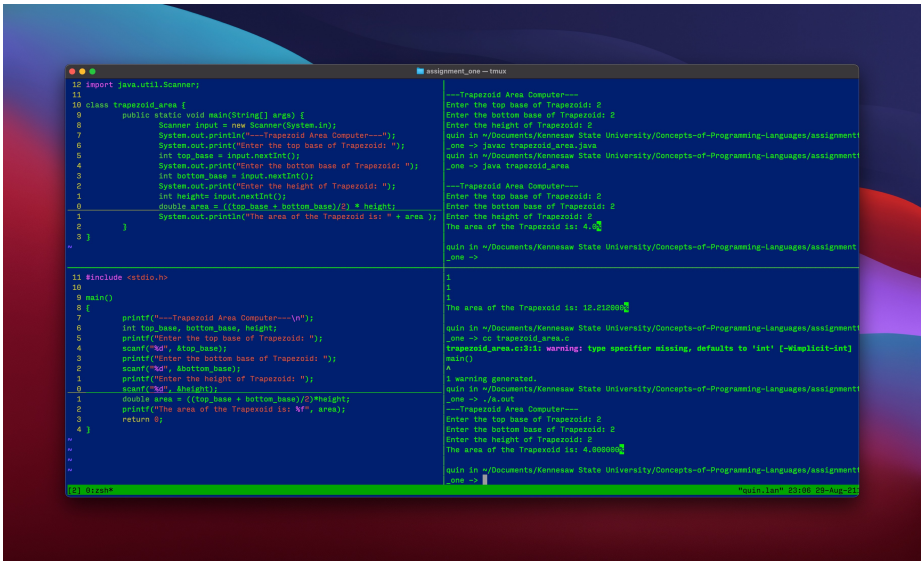
Problem One

Compiling and running programs on the command line.

- Open a command line window and compile the Java program with the 'javac' compiler.
- Verify that you have a compiled program using the 'dir' command (on Windows).
- Run the compiled program using the 'java' virtual machine.
- Compile and link the C++ program using the GNU C++ compiler.
- Verify that you have an executable file of the program.
- Execute the executable program.
- Show all your work.



Problem Two

Rewrite the BNF of Example 3.4 to give + precedence over * and force + to be right associative.

$$
\begin{aligned}
< assignment > &\mapsto < id > = < expression > \\
< id > &\mapsto A \\
< id > &\mapsto B \\
< id > &\mapsto C \\
< expression > &\mapsto < expresion > * < term > \\
< expression > &\mapsto < term > \\
< term > &\mapsto < factor > + < term > \\
< term > &\mapsto < factor > \\
< factor > &\mapsto < expression > \\
< factor > &\mapsto < id >
\end{aligned}
$$

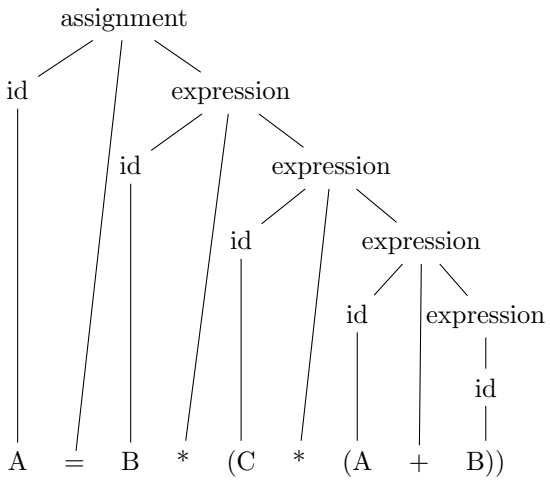
Problem Three

Using the grammar in Example 3.4, show a parse tree and a leftmost derivation for each of the following statement: $A = B * (C * (A + B))$

Derivation

$$
\begin{aligned}
< assignment > &\mapsto < id > = < expression > \\
&\mapsto A = < expression > \\
&\mapsto A = < id > * < expression > \\
&\mapsto A = B * < expression > \\
&\mapsto A = B * (< expression >) \\
&\mapsto A = B * (< id > * < expression >) \\
&\mapsto A = B * (C * < expression >) \\
&\mapsto A = B * (C * (< expression >)) \\
&\mapsto A = B * (C * (< id > + < expression >)) \\
&\mapsto A = B * (C * (A + < expression >)) \\
&\mapsto A = B * (C * (A + < id >)) \\
&\mapsto A = B * (C * (A + < B >))
\end{aligned}
$$

Parse Tree


assignment
id
expression
id
expression
id
expression
id
expression
id
A = B * (C * (A + B))