

CP471
Assignment 1

By
Austin Bursey

Due
January 27th 2020

First, the definition for Integer and Double

$\langle \text{integer} \rangle := \langle \text{digit} \rangle | \langle \text{digit} \rangle \langle \text{integer} \rangle | \langle \text{digit} \rangle \langle \text{int shortcut} \rangle | \langle \text{digit} \rangle \langle \text{lead-off} \rangle \langle \text{int shortcut} \rangle$

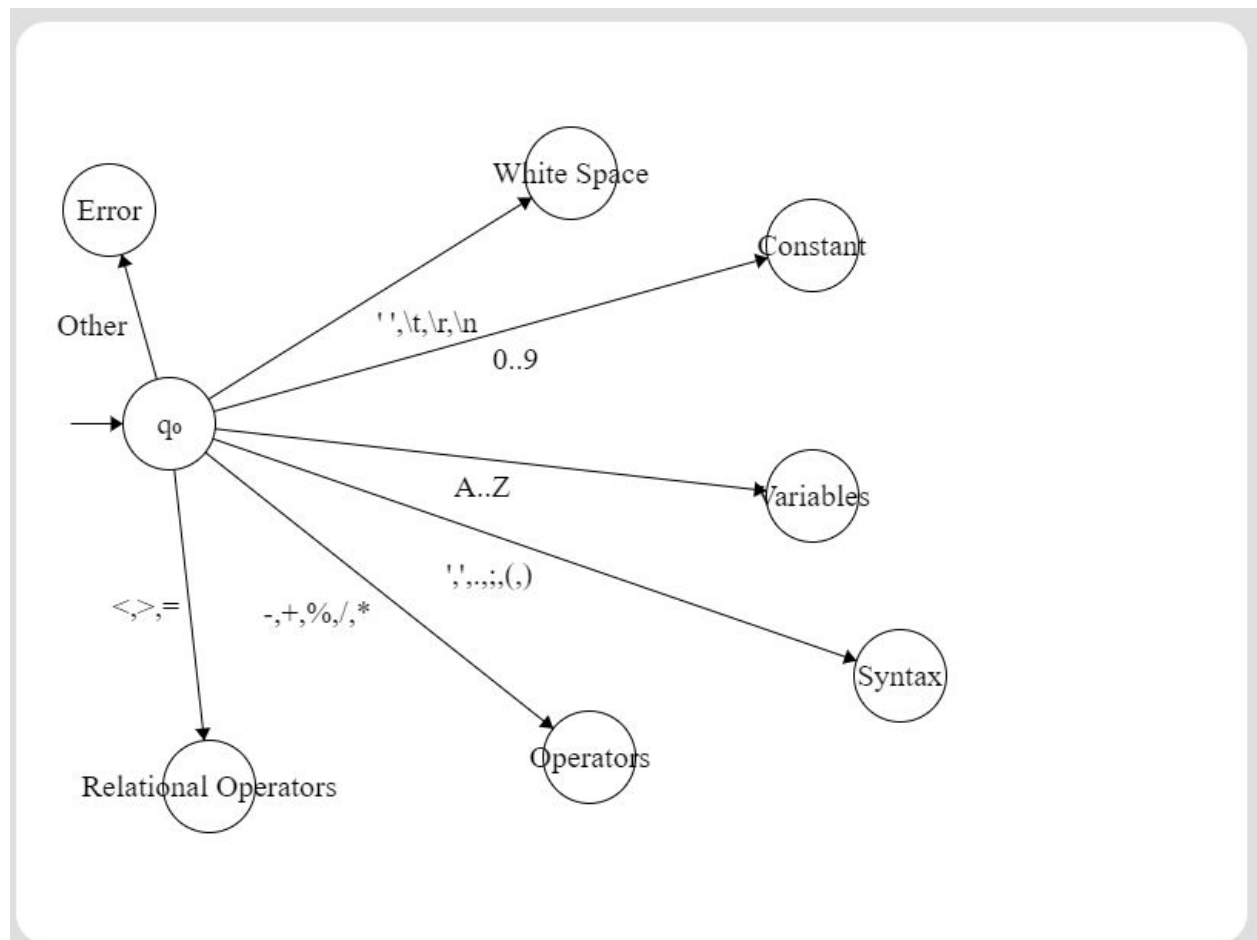
$\langle \text{int shortcut} \rangle := e \langle \text{leadoff} \rangle | e+ \langle \text{lead-off} \rangle$

$\langle \text{lead-off} \rangle := \langle \text{digit} \rangle | \langle \text{digit} \rangle \langle \text{lead-off} \rangle$

$\langle \text{double} \rangle := \langle \text{digit} \rangle | \langle \text{digit} \rangle \langle \text{double} \rangle | \langle \text{digit} \rangle \langle \text{double shortcut} \rangle | \langle \text{digit} \rangle \langle \text{lead-off} \rangle \langle \text{double shortcut} \rangle$

$\langle \text{double shortcut} \rangle := e- \langle \text{leadoff} \rangle | \langle \text{lead-off} \rangle$

State Diagrams of Lexical analyzer



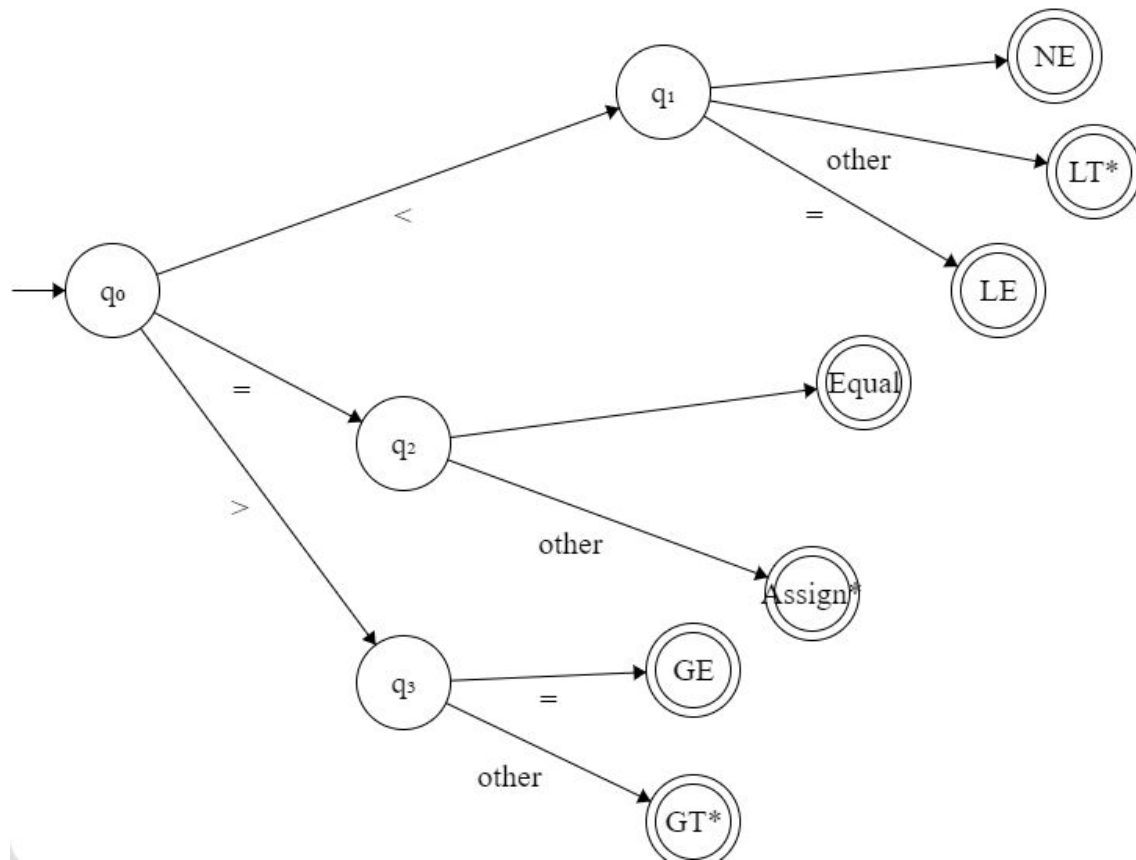
q_0 is the name of the starting state of the Lexical analyser.

Although this look like an NFA it is actually a DFA , each one of these states return to initial state 0 after failure or acceptance.

****NOTE** To keep the graph organized arrows leading from each state back to q_0 have been omitted. Any state ending in "*" returns to q_0 but also returns that last read character back to the buffer. Now to explain each state in turn.

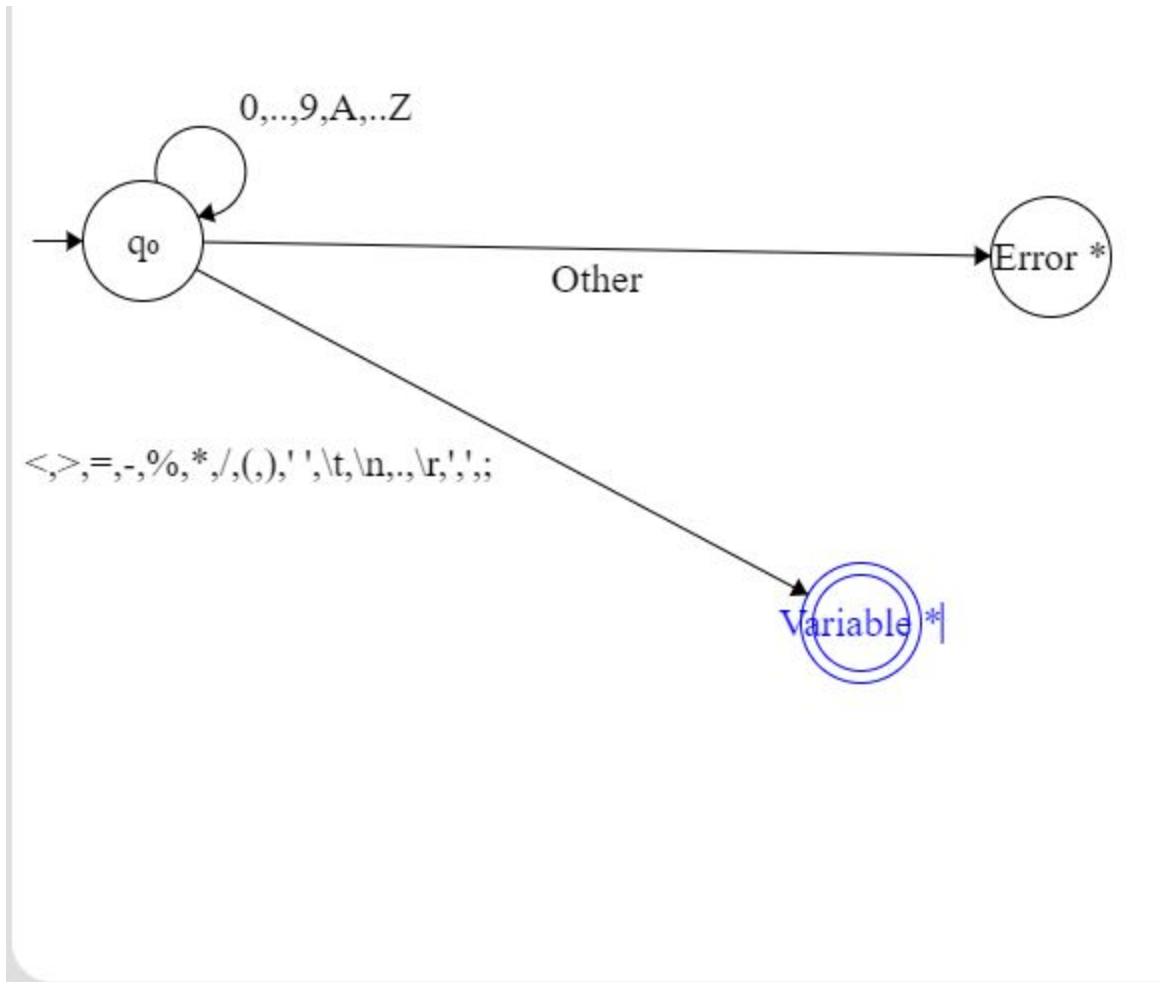
Operators, White Space, Error and *Syntax* are all in turn empty states that return back to q_0 immediately after labelling the their respective tokens.

Relational Operators



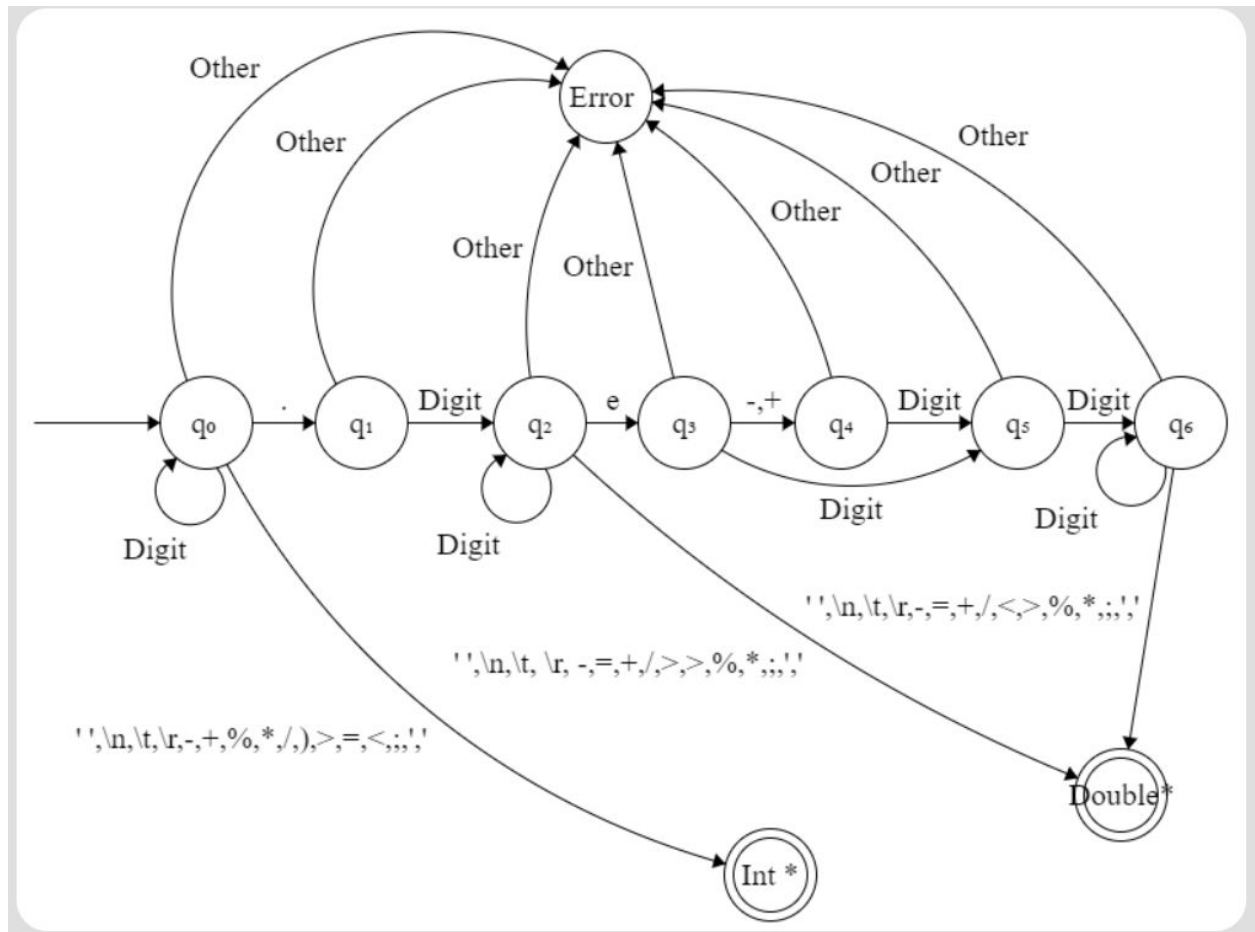
Each of these get labelled with the attribute “Relop” for coloring later, But get the designated final state name as their output token.

Id's



Each of these get labelled with the attribute “ID” for coloring later, But get the designated final state name as their output token.

Constants



Each of these get labelled with the attribute “Constant” for coloring later, But get the designated final state name as their output token.