CPSC 323
Project 2
Programming Assignment 2

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https://github.com/michaelbabinec/Compilers_Lexer/tree/main/PROJECT_2

How to Use

The input string is provided directly within the main function, in [string str]. The user only interacts with this string variable. After the input string is provided, the cpp file can be run, and the output will be generated within the command line, with input, grammar rules, stack table, and input acceptance being displayed.

Documentation

To begin the parsing process, an input string is fed into the parser. The first process covered is the printing of the result table in the command line. The original input string is printed, then the string_to_vector function is sent the string, where it is stored in a global character vector (myVector) with symbols and 'i' representing any "id" inputs, here, we also run a check for a valid string. The starting stack ($0) and grammar rules are printed to the terminal, and then the actual parse checking can begin.

The check_ vector function will take a single character element of the input vector then sends it to be analyzed with the current stack in the check_stack function. This is where a majority of our logic lies, as any shifts, reductions, and even the acceptance/non-acceptance of the entire input string is articulated here. Using vectors, we store and read the stack state during the process.

Reductions are actually processed in the reduce_stack function, with each reduction requiring it's own unique traversal to pop a value out of the stack, and then push the corresponding value into it's place, acceptance can be further verified here. In the event a non-terminal is pushed onto the stack, the nonterm_num function is called, where a number will be appended to the stack, to maintain which state the parser is in the table.

If the input vector can clear the various functions without throwing a non-accepted input result, and the function can reach the accepting state with a '$' in the stack_char variable, the input is accepted.