Circuit Simulator Project

Project Goal:

The main aim of this project is to build a full-fledged circuit simulator which can which can parse a given circuit and do the analysis of it. The project focuses on analysing the circuit containing passive as well as active elements including dependent and independent sources to find all the nodal voltages as well as the currents. We would also be extending if possible to do DC and transient analysis of the given circuit and if the time permits, we would be looking to solve a circuit with non-linear elements as well.

Work done / Targets achieved till now:

1. Studied and understood the working of Lex and Yacc.
2. Built a simple calculator with the help of Lex and Yacc.
3. Parsed the netlist file with the help of Lex and sent the tokens to Yacc file.
4. A logic is written to store the parsed data from the netlist file (with all the node information) dynamically into linked list data structure.

Future Targets:

1. Construction a matrix defining all the connections of the nodes from the link list.
2. Solve the matrix using Gaussian elimination to obtain all the nodal voltages and currents in every node and branch in the circuit.
3. Extend the logic to do a. op command.
4. Then extending the same logic for performing the DC voltage sweep operation.
5. Constructing a logic to perform the transient analysis.
6. If time permits, we will extend the project for non-linear devices as well.
7. We are even planning to write a logic for plotting a variable with respect to another in the circuit.

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