Software Requirements Specifications

CSL290 Assignment 2

AC-Circuit-Solver

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1 Problem statement

The assignment problem statement is to create a ac-circuit-solver application in two parts.

- **Part 1 -** An application which takes a circuit netlist file as input and produce an svg image of the circuit as output. The screen of the application is kept as non-resizable.
- **Part 2 -** An application which takes a circuit netlist file as input, produces an svg image of the circuit as output and also finds the values of voltages across components and currents through those components.

2 Description of Application

The program features are as follows :-

1. **Zoomable Image -**
   The svg image produced by the program is zoomable and user can zoom in and out the image by clicking zoom-in(+) and zoom-out(-) buttons on the window.
2. **Scalable Circuit -**
   The circuit produced by the program is scalable in the terms of nodes. User can add as high as 1000 nodes in the circuit.
3. **Clickable Components -**
   The circuit produced by the program is clickable i.e, user can click on any component and view the voltage and current associated with it. Upon clicking or hovering on a component, the corresponding part of the circuit gets zoomed-in and the properties of that component are displayed.
4. **Compact Circuit -**
   The created circuit will be compact i.e, if a voltage or current sour is connected to three or more components, then, program identifies this and doesn't copy the voltage or current source repeatedly.
5. **Circuit area minimization -**
   The circuit drawn by the program is visual friendly (components and nets are not messed up). The circuits seems to be close to that drawn by human.

6. **Error Generation -**
   The program generates errors like

   - *Open Circuit* - this error is generated when the specifications in the netlist file cannot create an open circuit. Although the program doesn't refrain from displaying the circuit. Voltage and current values are not calculated in this case.
   - *Short Circuit* - this error is generated when the specifications in the netlist file create a component which has no potential difference across it. Although the program doesn't refrain from displaying that component as a part of the circuit. Voltage and current values are calculated accordingly.

7. **SVG Viewer -**
   We will create our own viewer to display the svg image. The viewer will provide the zoomable and clickable features and the viewer window will be resizable also.

3 System requirements

1. Linux OS
2. Flex
3. Bison
4. OpenCV / Qt / OpenGL

4 Additional features

Removable components -
The user can remove any passive component like resistor, capacitor, and inductor by selecting and deleting the component. User can then revaluate the circuit.

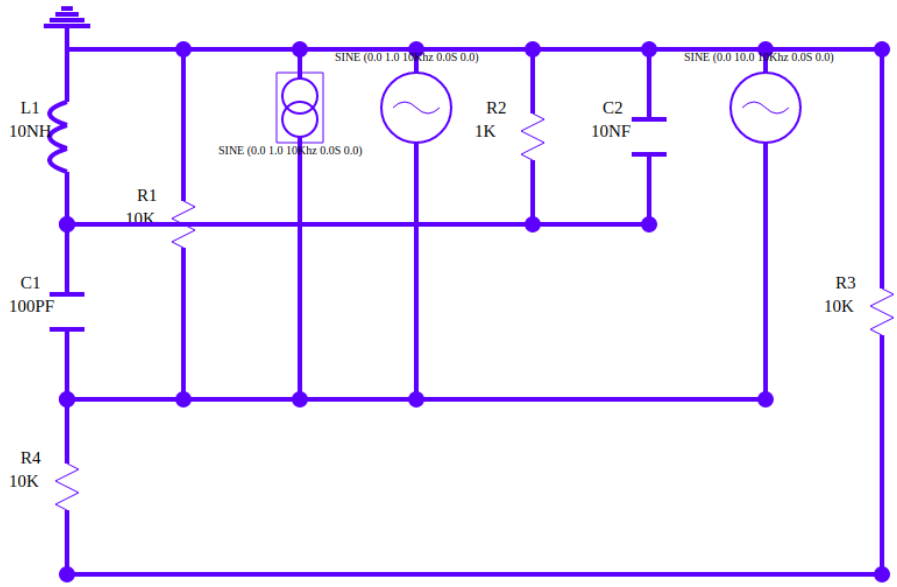

Figure 1: SVG Image generated by the program