SOFTWARE REQUIREMENTS SPECIFICATION

for

Circuit Simulator

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1 Introduction

1.1 Purpose

It is very hard and time consuming to solve a circuit having many components. As there will be many equation to solve simultenously. The number of equation furthur increases as we increase the number of component. So we are making a circuit simulator which will give solve circuits in no time and also give all the data that we want from a circuit.

1.2 Document Conventions

All the convention in this SRS is in standard form. For example currnt is denoted by I, voltage by V, resistance by R, inductor by L and capacitor by C. We will use K, M, m, n, u for Kilo, Mega, mili, nano, micro respectively.

1.3 Intended Audience and Reading Suggestions

This document is made for users having basic knowledge of circuit (and some basic computer konowledge). This will give some discription of what we are going to bulid. First the overview will give what is the plot of our simulator. Then we wll give the features of our simulator. After all of this we will give the system requirements.

1.4 Project Scope

This app is all about getting the information about a circuit. It will reduce time to solve any circuit. It will also be very accurate. The other benifit is that we do not have to make whole circuit but we only need to provide the data and the simulator will automatically draw the circuit and also provide the information related to any component.

1.5 References

All the references are as follows:
1. MIT AC Circuit analysis notes. http://web.mit.edu/8.02t/www/802TEAL3D/visualizations/coursenotes/modules/guide12.pdf
2. Refer SVG Primer https://www.w3.org/Graphics/SVG/IG/resources/svgprimer.html for basic SVG help.
3. Online AC Circuit simulator. https://www.partsim.com

4. Solving multi-frequency circuits. https://www.allaboutcircuits.com/textbook/alternating-current/chpt-7/circuit-effects/

2 Overall Description

2.1 Product Perspective

As mentioned earlier, this application is made to solve circuits. It follow all the rules of any included element.

2.2 Product Functions

The application will make the circuit from the data which is written in the input file. It also will give error if anything wrong is written in the input file. So when the circuit is made if we want to know any information like the current through any component, voltage across any component, magnitude of any element etc. we can see that by moving our cursor to that particular element and a pop-up will come out carrying all these information. The application will also gives an output file containig all the data of voltage and current related to each element.

2.3 User Classes and Characteristics

This application is mainly for user of Electrical and Computer Science background. It will help the Electrical user in solving any difficult curcuit. If they want to see the behavior of th circuit with different input elements this app will them. For CS user this is a good exaple of how to make basic application.

2.4 Operating Environment

This application will work on linux platform. The user also also require a c++ compiler and some libraries(which we will specify later) to be installed. The user also require browser to be installed on their pc to run svg file which is produced.

2.5 Design and Implementation Constraints

First of all the input file must not have any error so our application may work. if there were any error, this application will not make any svg file. Secondly, the number of element in the input file should not exceed a particular limit(which we define later). This is because if we make the number of element very high then as zooming is not more than 3 times (as of now) all the element will make cluster and it will become hard to see all element properly.

2.6 User Documentation

The primary goal of this application is to facilitate the process of solving the circuit. Consequently, the application will be designed to be as simple to use as possible. Nonetheless, users may still require some supplementary information about each component of this application. The application will contain two features that offer this: an output text file which gives all required information of circuit(which we discussed earlier) and an svg image which will give these information.

2.7 Assumptions and Dependencies

We have assumed that the name of resitance, capacitor, inductor, current source and voltage source will start from the letter "R", "C","L","I" and "V" respectively. The small case of these names are also possible.