Group Report

During this scenario week, we worked on a project that consisted of making a circuit simulator desktop application. The aim was to create an application that could be used by students to create circuit diagrams online and would also display appropriate information where needed such as voltage and current.

We started off this project by researching all the available resources that could be used. We looked at the different languages that had a widget toolkit or a GUI library as that was one of our constraints and decided that Java would be the best option as we had all experienced working with it before. We decided to use JavaFX to design the user interface as it offered some great features. We choose NetBeans as our IDE and GitHub for version control.

Before, we actually started making the application, we planned it out, and decided on what classes we would need and how they would all link together. We ended up making a draganddrop class which is used to implement the drag and drop feature, a circuit class that models the circuit, a component class that contains the properties for each component and a separate class for all the components which extend the component class. Furthermore, we decided that our app would contain wires, lamps, batteries, resistors, switches, ammeters and voltmeters for the components so that the calculations wouldn’t get too complicated as we wanted to focus on the functionality of the application, rather than wasting too much time trying to work out the physics.

In addition, we went through some physics circuit calculations so we could use this knowledge to do the current and voltage calculations. We also used Oracle documentations and Stackoverflow for tutorials and help with fixing bugs.

First thing we started coding was the implementation of the drag and drop feature and the interface. We did this by using the draganddrop event handlers which are built into JavaFX. We also looked at the different example codes available online and used them for help. The user interface displays a list of the components on the left side and a grid on the right where the components can be dragged and dropped to make a circuit. This was done using Vbox, label, textfield, button, gridpane etc.

Secondly, we started coding the classes for each component. Each one contains appropriate get and set methods and the ammeter and voltmeter classes contain methods for calculating the current and voltage.

Moreover, we added a feature that allows the user to change the properties of certain components. For example, if a user adds a lamp, they can input the resistance and the status of the lamp (on/off) which affects the calculations of the current and voltage.

Sources: