Chapter 9

Graphical User Interface (GUI)

All the developed modules can be integrated together in one place to make a convenient GUI for ease of use of the practising engineers. So far, the overall framework of the GUI has been prepared in GNU Octave (open-source platform), in which the dynamic power flow module is already integrated. The other modules can be integrated into the GUI in a similar manner. The step-by-step demonstration of the developed GUI is shown below.

Figure 9.1 shows the very first pop-up window displayed after running the GUI. It shows the various features of the developed software. The user has to select one, and it will proceed accordingly.

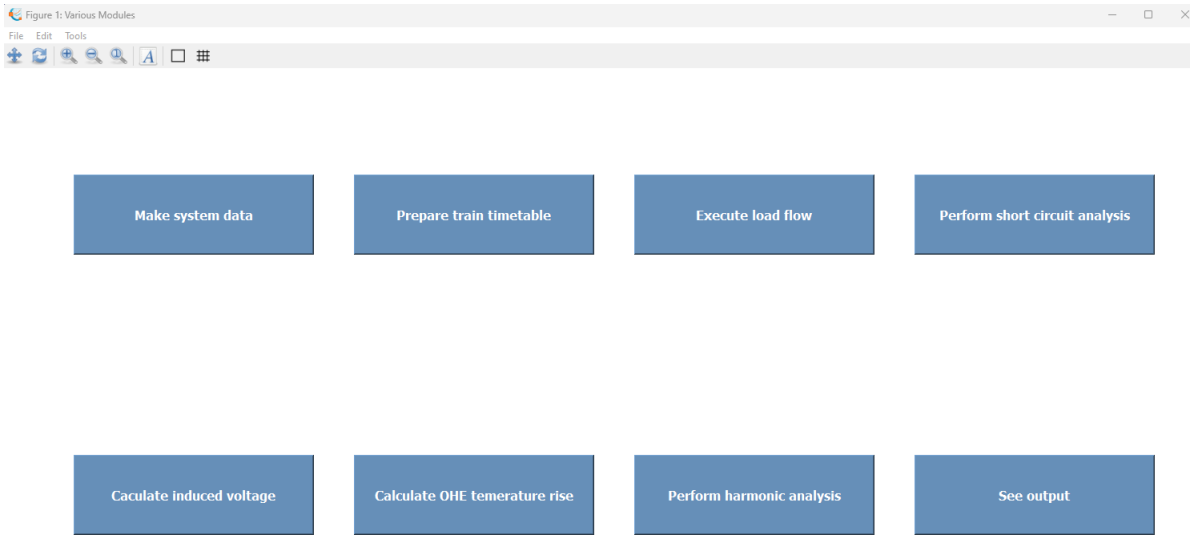

Figure 9.1: Pop-up window showing various modules

Figure 9.2 shows the pop-up window displayed after selecting the "Make system data" option. It asks the user whether he/she wants to prepare fresh data for a new system or edit the previously stored system data.

If the user selects the "Prepare Fresh Data" option, the pop-up window shown in Figure 9.3 will be displayed. It asks the user to enter the input data and the user has

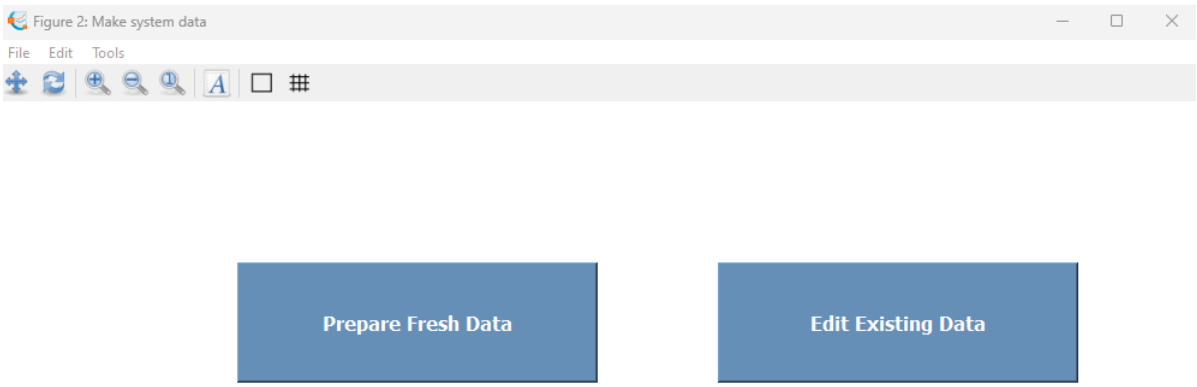

Figure 9.2: Pop-up window showing options for making system data

to enter the values accordingly. After entering all the asked values the user has to click on the "OK" button. Then the next pop-up window asking for the user inputs will be displayed as shown in Figure 9.4. In case the user missed entering any value and clicked "OK", then the pop-up window shown in Figure 9.5 will be displayed. It shows the default values to be used for the missing inputs. If the user wants to proceed with these values he/she has to select "OK" or else he/she can go back and re-enter the inputs by selecting the "Re-enter" option. The subsequent pop-up windows, after the one shown in Figure 9.4, asking for the user inputs are shown in Figures 9.6, 9.7 and 9.8.

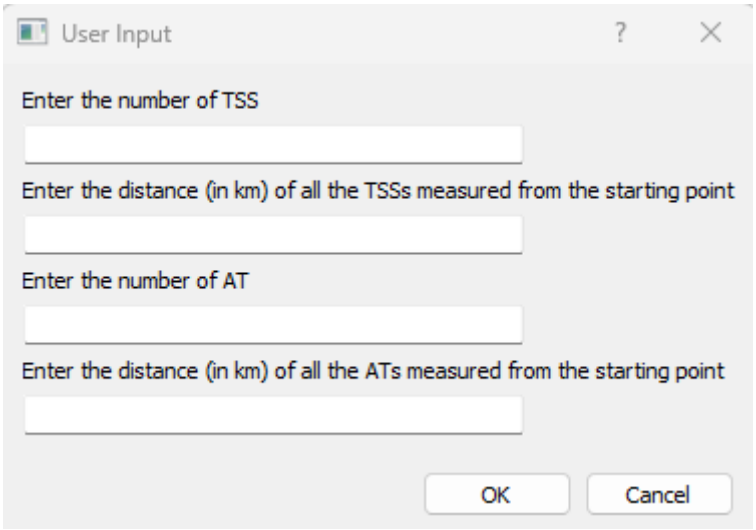

Figure 9.3: Pop-up window asking user inputs for number and location of TSS and AT

After entering the values and clicking on "OK" on the pop-up window shown in Figure 9.8, the next pop-up window shown in Figure 9.9 will be displayed asking the user to save the data file in .txt format by specifying the file location and file name. By doing so, the system data (.txt file) will be saved by a user-defined file name stored in a user-defined location.

If the user selects the "Edit Existing Data" option on the pop-up window shown in Figure 9.2, the next pop-up window shown in Figure 9.10 will be displayed asking the

user to select and open the existing system data file (.txt format). Then the user can edit the data in that file and save the updated system data.

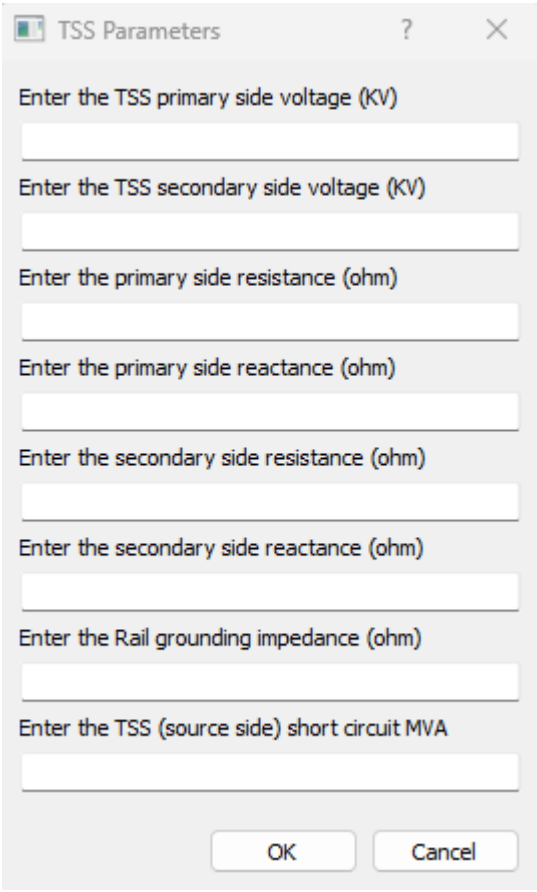

Figure 9.4: Pop-up window asking user inputs for TSS parameters

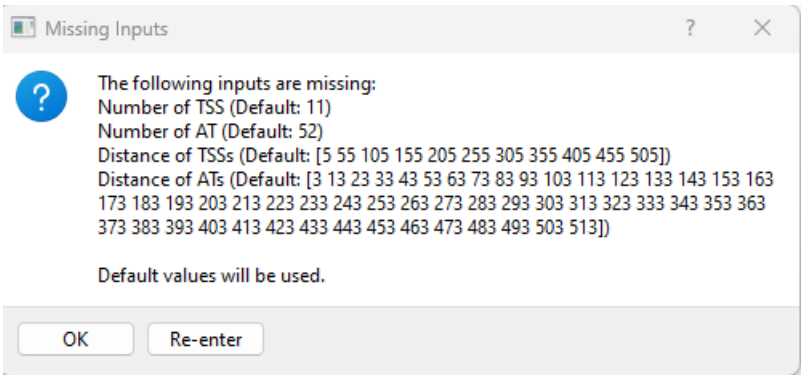

Figure 9.5: Pop-up window showing missing inputs

Figure 9.11 shows the pop-up window displayed after selecting the "Execute load flow" option on the pop-up window shown in Figure 9.1. It shows the options for various tracks and the user has to select one for which he/she wants to execute the load flow. After the user selects any one track, the pop-up window shown in Figure 9.12 will be displayed asking the user to upload the system data file which has been prepared earlier. The user has to click on the "Upload" button. Then the pop-up window shown in Figure 9.13 will be displayed asking the user to select the data file. The user has

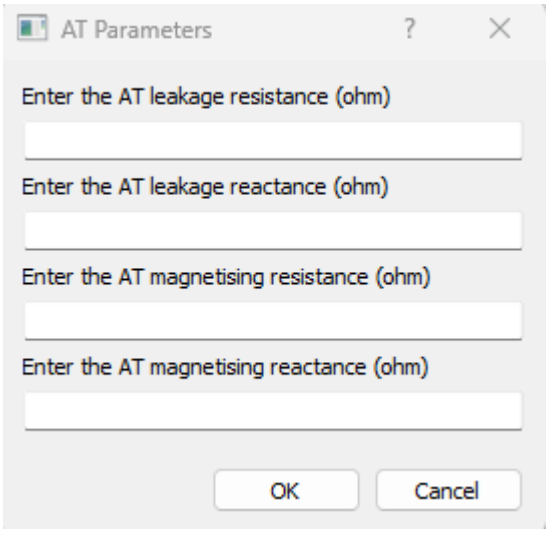

Figure 9.6: Pop-up window asking user inputs for AT parameters

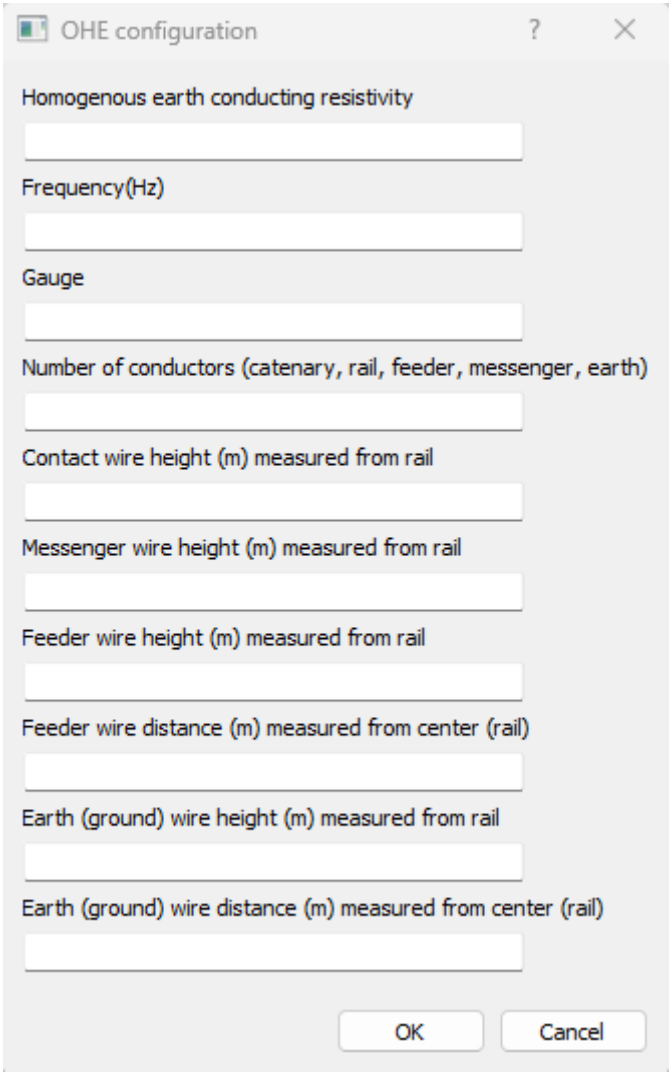

Figure 9.7: Pop-up window asking user inputs for OHE orientation

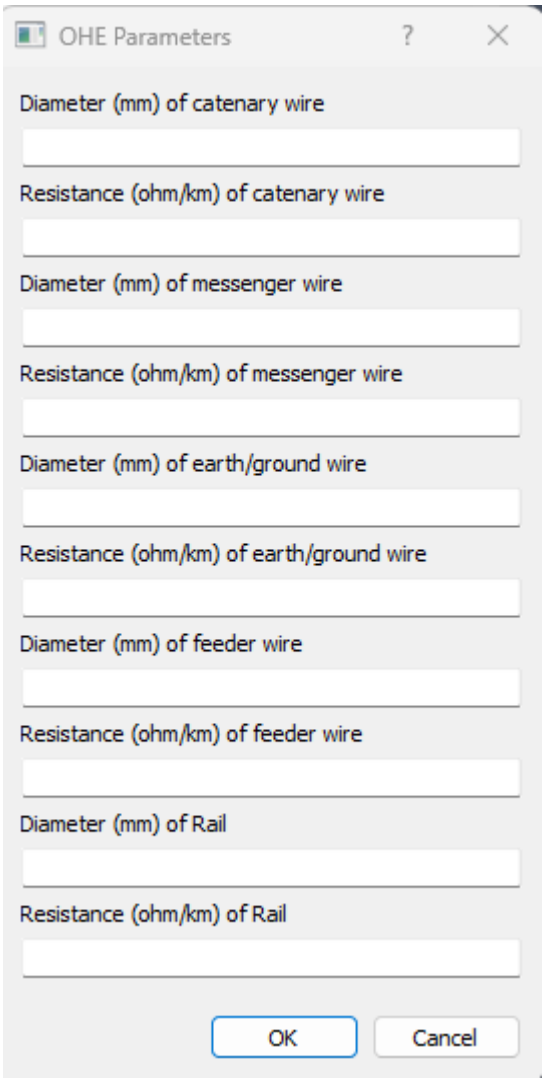

Figure 9.8: Pop-up window asking user inputs for OHE parameters

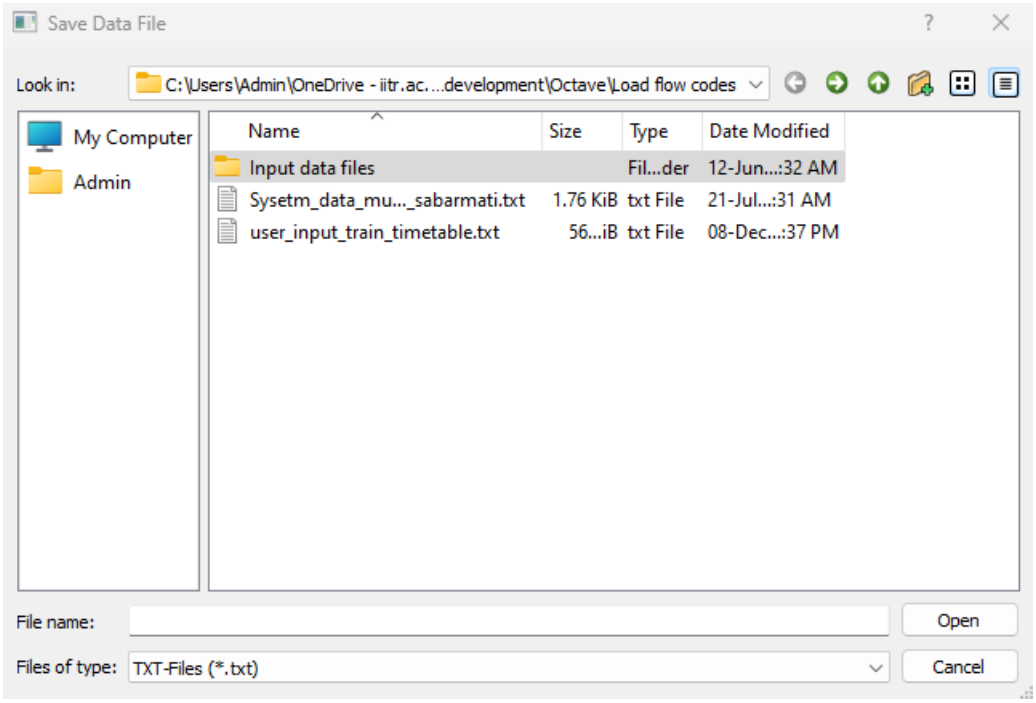

Figure 9.9: Pop-up window to save the data file

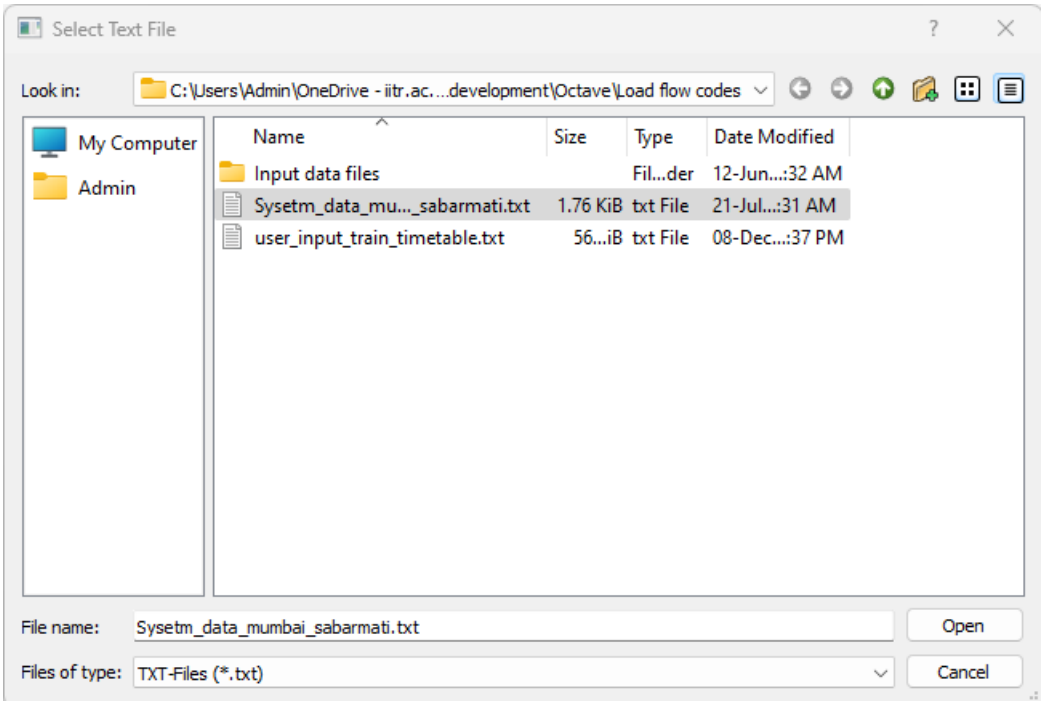

Figure 9.10: Pop-up window to open the existing data file

to select the specific file and click on the "Open" button. Then the pop-up window shown in Figure 9.14 will be displayed asking the user to upload the train timetable file which has already been generated using the train timetable module. The user has to click on the "Upload" button. Then the pop-up window shown in Figure 9.15 will be displayed asking the user to select the file. The user has to select the specific file which contains the train timetable and click on the "Open" button. Then the pop-up window shown in Figure 9.16 will be displayed asking for user inputs regarding train scheduling information. The user has to enter the values and click on the "OK" button, after which the load flow program will be executed at the backend.

Figure 9.17 shows the pop-up window displayed after selecting the "See output" option on the pop-up window shown in Figure 9.1. It shows the options for all modules' output and the user has to select one module whose output he/she wants to observe. After selecting the "Output of load flow" option, the pop-up window shown in Figure 9.18 will be displayed which shows the options of various tracks and the user has to select one whose load flow output he/she wants to see. After selecting any one track, the pop-up window shown in Figure 9.19 will be displayed. It shows various load flow output options and the user has to select one which he/she wants to see. After selecting the "Voltage at a particular time instant" option, the pop-up window shown in Figure 9.20 will be displayed asking the user to enter the time instant and distance resolution. The user has to enter the values and click on the "OK" button. Then a pop-up window shown in Figure 9.21 will be displayed which shows the desired output. The user can similarly observe the other output results of the load flow program.

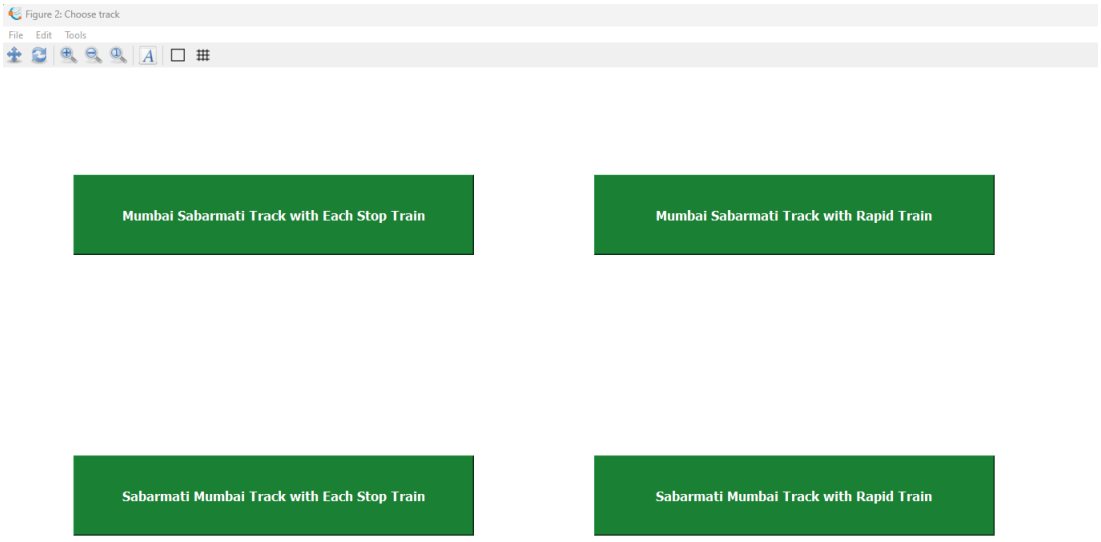

Figure 9.11: Pop-up window to select the track to execute its load flow

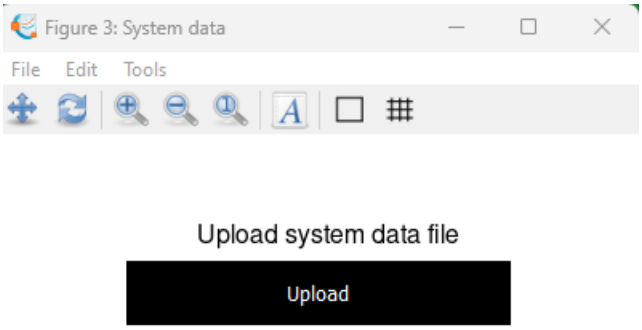

Figure 9.12: Pop-up window to upload the system data file

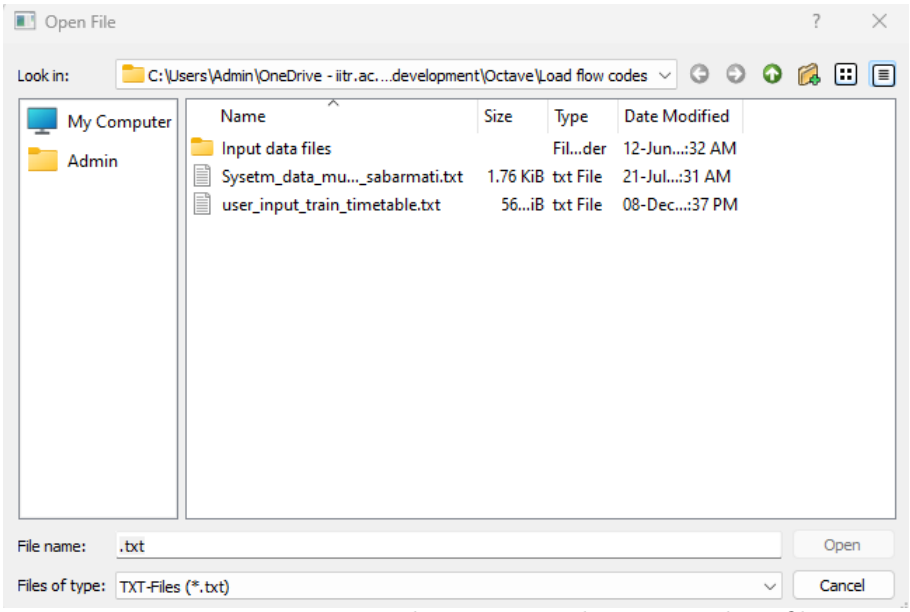

Figure 9.13: Pop-up window to open the system data file

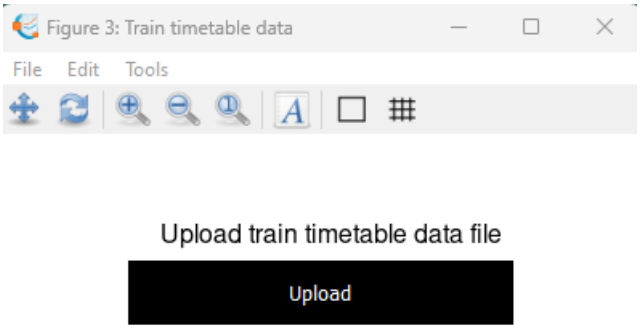

Figure 9.14: Pop-up window to upload the train timetable data file

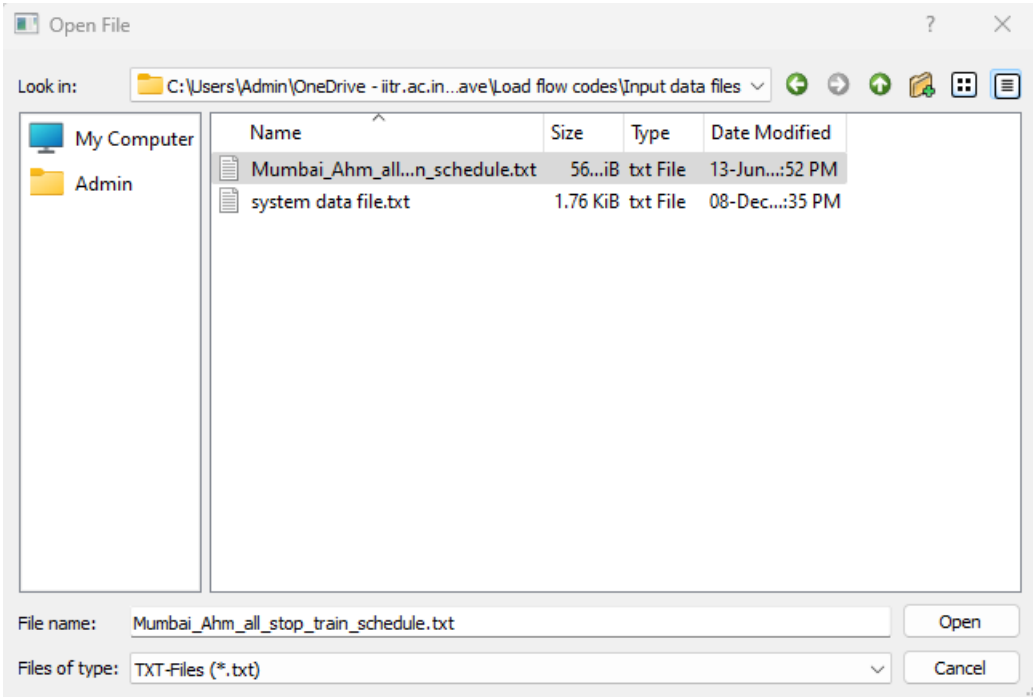

Figure 9.15: Pop-up window to open the train timetable data file

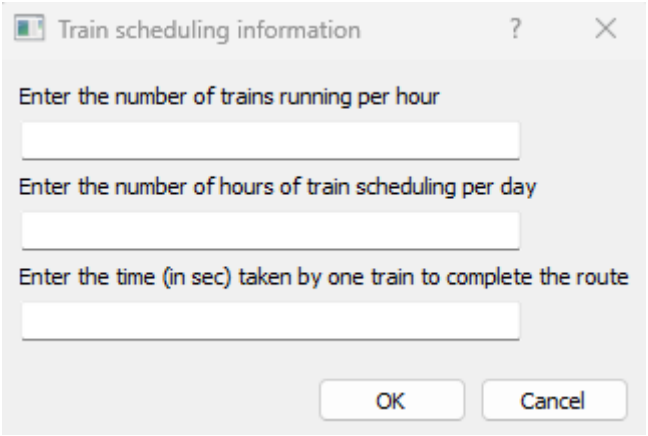

Figure 9.16: Pop-up window asking user inputs for train scheduling information

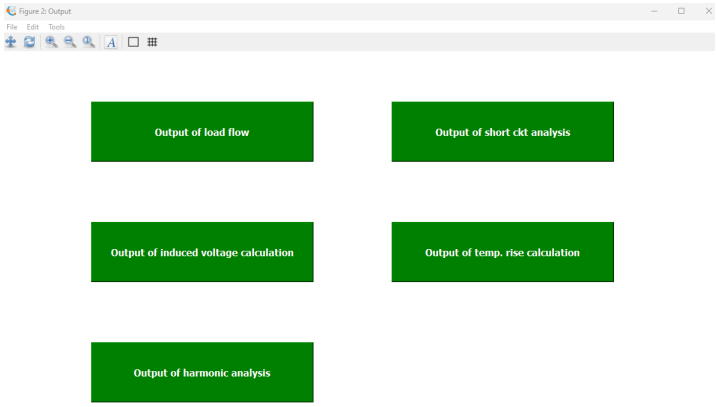

Figure 9.17: Pop-up window showing options for all modules' output

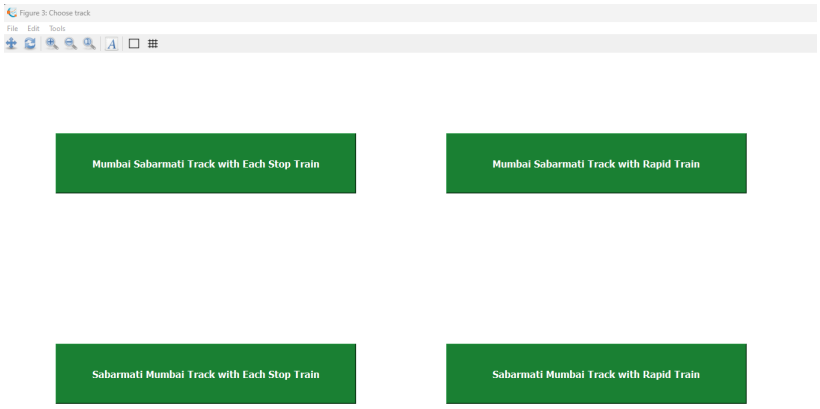

Figure 9.18: Pop-up window to select the track to see its load flow output

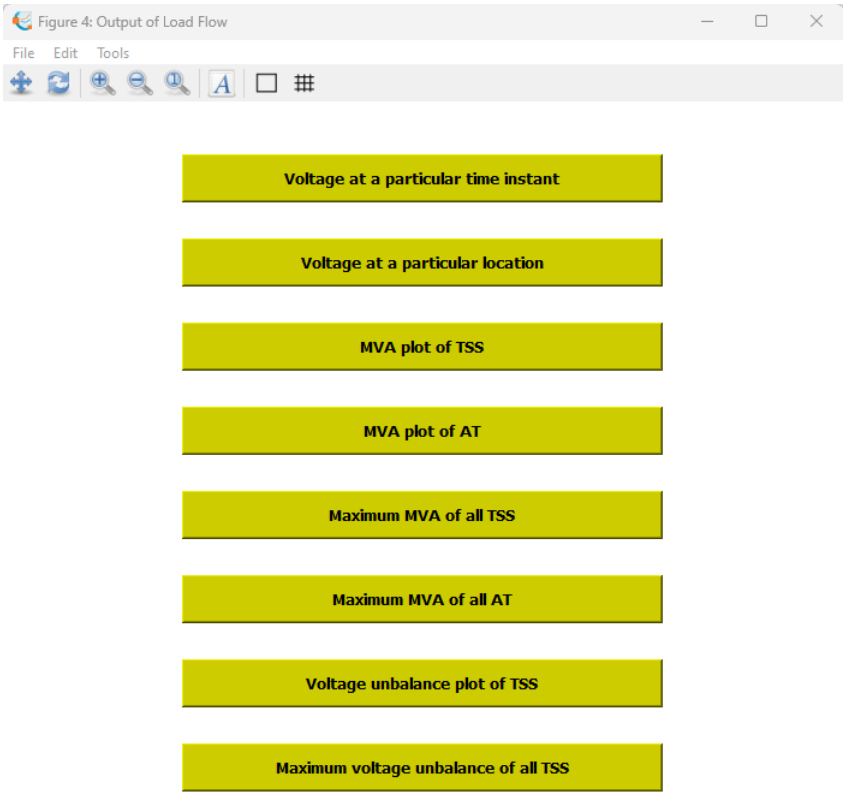

Figure 9.19: Pop-up window showing various load flow output options

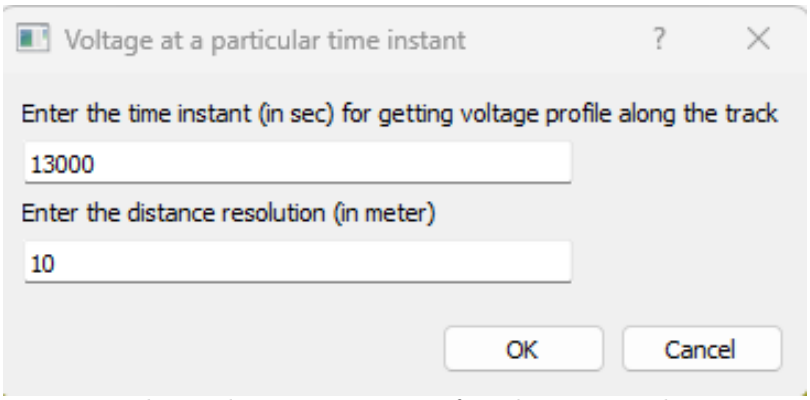

Figure 9.20: Pop-up window asking user inputs for obtaining voltage at a particular time instant

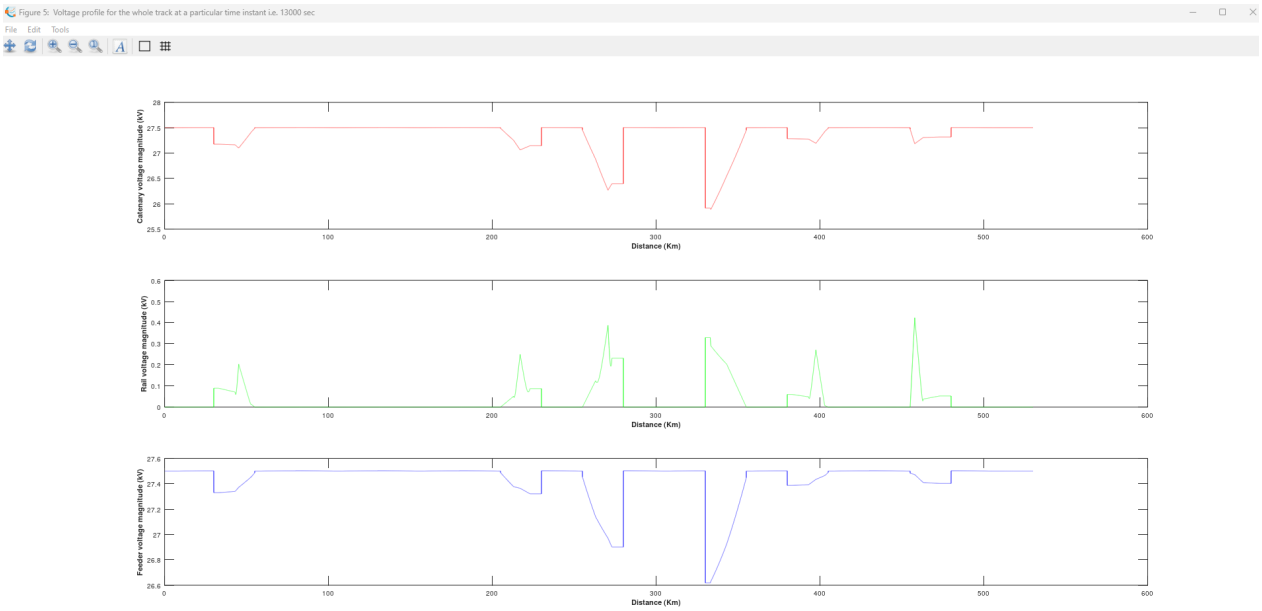

Figure 9.21: Pop-up window showing the plot for voltage at a particular time instant