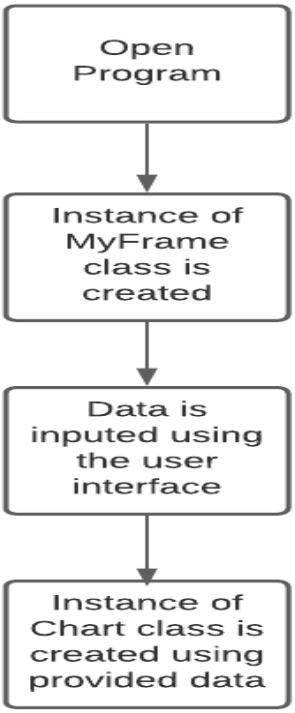
Part B: Design

Class Interaction

The interaction between classes starts in the main method. Here, an instance of the MyFrame class is created in order to create the user interface. After the user interface has been created and the required data has been inputted for graphing, an instance of the Chart class is created and displayed.



Object Design

In the program, both customer data and benchmark data are created as objects. Each CustomerData object is created with a String as a name and doubles for the mean, median, maximum, and minimum. Each BenchmarkData object is created with a String as a name and doubles for the 25th percentile, median, and 75th percentile. Both types of objects are merely used to store the value of each data set to be used later. The only action that can be performed using a CustomerData or BenchmarkData object is to get the value of an instance's instance variable.

The MyFrame object is used to create the user interface and any components that are contained within the main window of the program. The MyFrame class uses the JFrame constructor to create the frame. JButtons, JFileChoosers, and JComboBoxes are also used in order to create the program. When a new excel file is selected to be read, the frame adds a JComboBox in order to create a drop down menu with all available CustomerData or BenchmarkData objects. The JComboBox then initializes the selected object in order to be used in the graphing class.

The Chart object is used in order to create and present the graphical analysis of the provided data. The Chart object uses the JFrame constructor in order to create a new JFrame that exclusively shows the graph. The Chart object takes advantage of the Sample2D function from the JFreeChart library. The function uses the median from the provided BenchmarkData object, and it calculates the deviation using the getVar method. Using these numbers, the Chart object creates a normal distribution graph. Using Marker objects from the JFreeChart library, the chart shows the location of the 25th percentile and 75th percentile from the provided BenchmarkData object. A Marker object is also used to graph the median of the provided CustomerData object. When the median of the CustomerData object is greater than the 75th percentile of the BenchmarkData object, the Marker is graphed red; it is graphed blue if this is not true. The graph is then displayed to the user.

User Interface Design

The user interface of the program is made to be easy to understand. First, a singular JFrame is created with three buttons inside of it. Two buttons, one for the selection of a customer excel file and the other for the selection of a benchmark excel file, add JFileChoosers to the frame in order to allow the user to select the desired file. These JFileChoosers implement a FileFilter object in order to make the file selection process easier for the user by only narrowing down the possible files that can be selected. When a proper file is selected and the respective JComboBox is initialized (see Object Design, paragraph two), the user can select which object should be selected. The JComboBox was an appropriate tool for this program because it allows the user to see all of the CustomerData and BenchmarkData objects without taking up a large portion of the JFrame.

Diagram of Program Actions

Flowchart

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