**2D Spectrum Graph**

**buttons.js 🡪 invokeSpectrum.js 🡪 dataSource.js 🡪 spectrumPoints.js**

**buttons.js:**

-> buttons()

* buttons() function contains on click event listener which invokes drawSpectrum() of “invokeSpectrum.js” on click of “show spectrum” button

**invokeSpectrum.js:**

-> drawSpectrum()

-> Spectrum()

-> axisConversion()

-> cmpMassIntensity()

-> addPeaks()

-> addAxis()

-> addEnvelopes()

* drawSpectrum() invokes Spectrum() which initializes the svg with width and height, a rectangle of x-axis group and a rectangle of y-axis group.
* drawSpectrum() invokes axisConversion() of dataSource.js which get the data from datafile(spectrum) and creates x scale, y scale
* drawSpectrum() invokes cmpMassIntensity() of dataSource.js which compares mass with the domain and range and pass the data that needs to be shown at that point to peakmassShow, peakintensityShow, peakCircleDataShow
* drawSpectrum() invokes addPeaks () of spectrumPoints.js which adds peaks
* drawSpectrum() invokes addAxis() of spectrumPoints.js which adds axis
* drawSpectrum() invokes addEnvelopes() of spectrumPoints.js which adds circles for envelope data

-> Spectrum()

->DataSource()

* It invokes DataSource() and initializes the variables
* Spectrum() function initializes the svg with width and height
* It creates group\_bottom group and binds it with xZoom call. It creates a new rectangle tect\_bottom group by assigning with width and height
* It creates group\_top group and binds it with yZoom call. It creates a new rectangle tect\_top group by assigning width and height

**dataSource.js:**

dataSource.js contains dataSource() function which controls the actions on the graph like passing the required data, zooming in, zooming out,panning the axis etc.,.

->DataSource()

-> axisConversion()

-> cmpMassIntensity()

-> onEnvelophover()

-> onPeakhover()

-> over()

-> out()

-> xZoom

-> yZoom

-> xZoomed()

-> yZoomed()

* **axisConversion**():
  + axisConversion function retrieves the data from data file “spectrum” which contain data variable spectrum\_data
  + Passes the mz data into peakmass and intensity to peakintensity
  + Passes the envelopes data to peakCircleData and sort the data based on mz values in env\_peaks
  + Initializes the start Domain, End Domain and range
  + If the spectrum is invoked on click of “mono mass”, get the mz values and set the start and end domain accordingly by using adjacentRange and MassMzCenterPointer
  + Initialize the xScale and yScale with start and end domain and range
  + Initialize the new X and Y scales with initial xScale and yScale
  + Initialize the xAxis and yAxis to draw the x axis and y axis with required ticks,ticksize and tickpadding
* **cmpMassIntensity():**
  + This function is invoked on every zoom-in, zoom-out and panning
  + cmpMassIntensity function compares the peakmass, peakintensity and peakCircleData with the start and end domain of the x-axis and pass the data to be shown on the graph to peakmassShow, peakintensityShow and peakCircleDataShow
  + OnClick of the mono mass we get data into MassMzCenterPointer, if the data is not null, show the graph y axis maximum value in the range to be at 75% of the y axis and set the radius factor to be high