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JFreeChart Implementation

For this program, I am doing the JFreeChart implementation of the plot salt and smooth program. I did not make this program have an input or output of CSV because the main focus is to have it display a graph. As far as the x value goes, I never have to update it so the x remains the same between all data manipulators. The function for this is the same being  $y=x^2+13$ .

## Plotting

Just used a simple for loop to assign the values to the ArrayList

## Salting

The salting values used were -2500-2000

## Smoothing

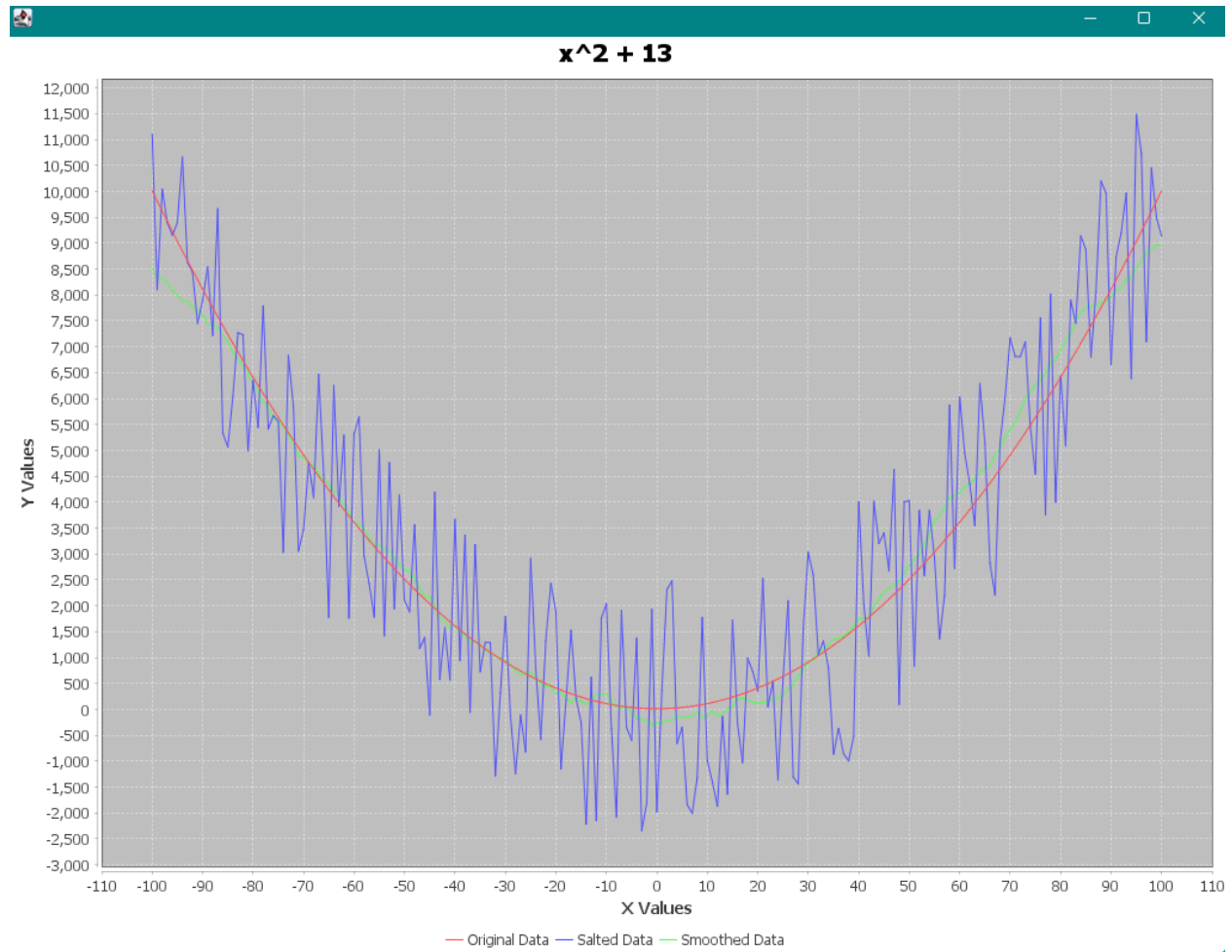
To smooth the values, I chose to use the same method as the first smoother. The window I used was 15.

The cool thing I did with this was have all 3 of the function graphs overlay in the same graph with different colors. It looks like this

The red line is the normal plotted like  $(x^2 + 13)$

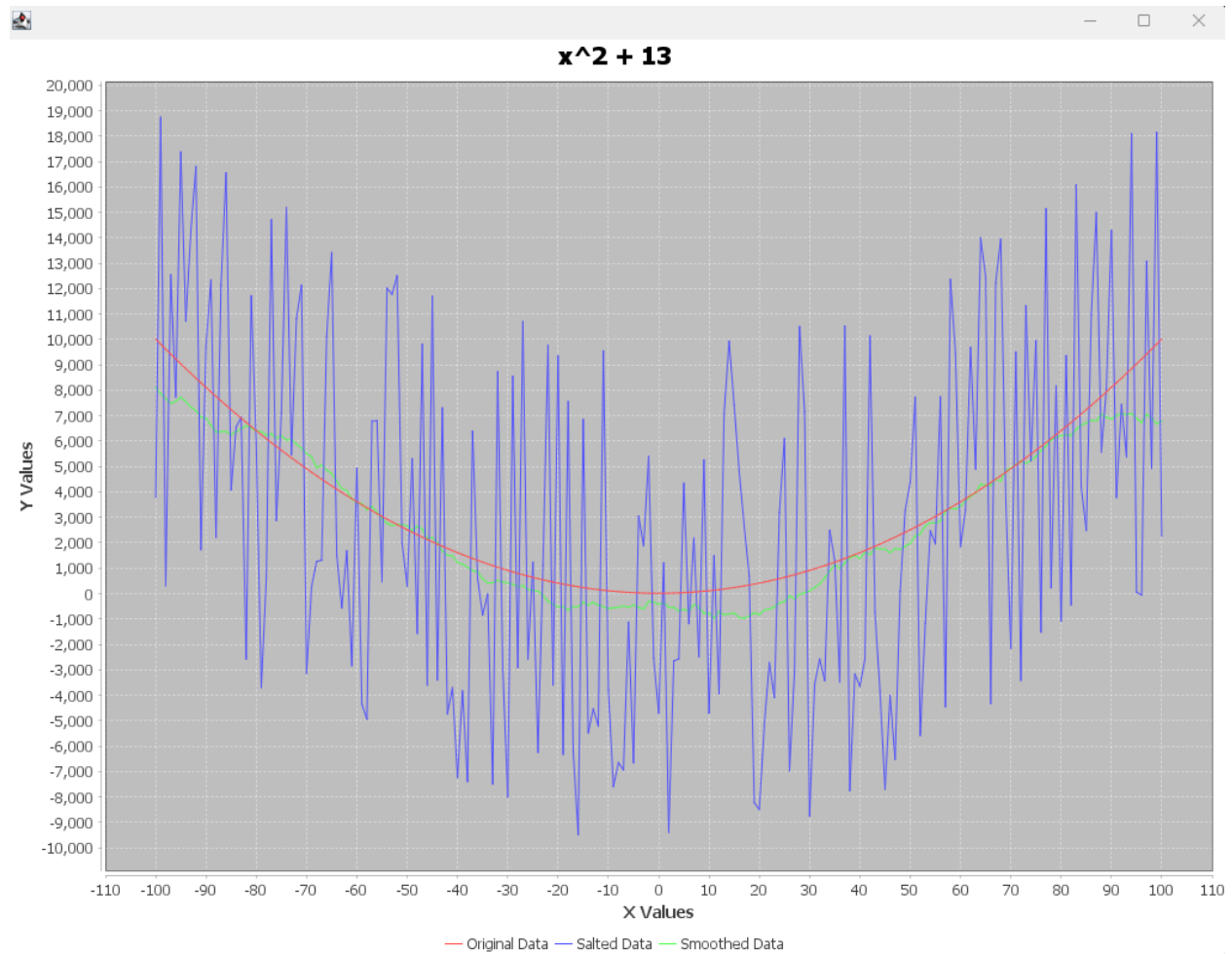
The blue line is the salted line, notice how it is very scattered.

The green line is the smoothed line from the blue line. As you can see, it is very close to the original graph. The smoothing amount of 15 seemed to work the best while still being able to tell the difference between that and the original graph function.



In this example, I increased the salting range from -10000 to 10000. Notice how the smoothed graph with the original value changes since the range of the salting increased. We are now going to increase the window for smoothing to account for the larger range.

I increased the window value to 30. Since the variance is much larger, it is harder for the algorithm to accurately smooth the graph to the level of the less sparse graph from the salter.



Due to the amount of salt for this one, the range changed and that is why the curves look different. Other than that, everything works flawlessly here.

## Sources

<https://www.jfree.org/jfreechart/api/javadoc/index.html>

<https://www.jfree.org/jfreechart/api/javadoc/org/jfree/chart/plot/XYPlot.html>

<https://commons.apache.org/proper/commons-math/commons-math-docs/apidocs/index.html>