Santino Celebre Project 1

For this project we were to implement a few programs, constantly edit a “StatsLibrary”, include a homework assignment on histograms back from September, and formulate a written theorem/definition sheet on the ones we have learned so far.

**StatsLibrary**

This program was built to do solve a few set theory problems and some probability problems. These included find the mean, median, and mode of a set of numbers. Also finding the intersection, union, and complement of two different lists. These three were the most fun for me to implement because I started learning what hash set was and after that it became easy. I also created a method to solve standard deviation and variance for any set of numbers. Next, we were able to implement the more important formulas we learned this semester, and these were permutations, combinations, binomial distribution, hypergeometric distribution, geometric distribution. These were a little more complicated to implement but, in the end, I was able to break it down step by step and finish the implementation.

**Birthday/MonteHall**

After StatsLibrary we had a birthday program which showed the probabilities of people in the class sharing birthdays and the MonteHall problem that was given from the book. In my opinion the MonteHall problem was a more complex problem to think about and especially implement. It is very hard to wrap your brain around ask first glance at the problem I would say switching doors is only a 50/50 chance of being any better than the initial pick but your odds literally double from switching doors. The birthday program is also interesting to think about because your first instinct would say sharing a birthday in a room full of X amount of people is very odd, but in fact in a room of 23 people it is almost a 50% chance someone shares a birthday. In a room full of 75 people, it pushes those odds to above 90%.

**FishMarket**

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**Plotter, Smoother, and Salter Program**

After figuring out how to create and edit a CSV file the plotter class became easy to create the table with given x/y values, for some reason since the file was not an XSL file every time I reopened the file the histogram of the table would be gone. Since I already created the plotter going in and “salting” the data was just changing Y values to random values. The smoothing class took those Y values and found averages between them giving something close to the original plotter table. I found online that salting data is used a lot in cryptography and in security so that was interesting.

**Everything Else**

**The histogram homework was just maneuvering through excel and did help me learn excel a little bit better. The formula sheet was helpful to have during the studying and creating of my cheat sheet for Exam 1 so that was good. Lastly, I found it very helpful that we were submitting work through GitHub because it really made everything super organized and easy to make sure I submitted everything that needed to be submitted.**