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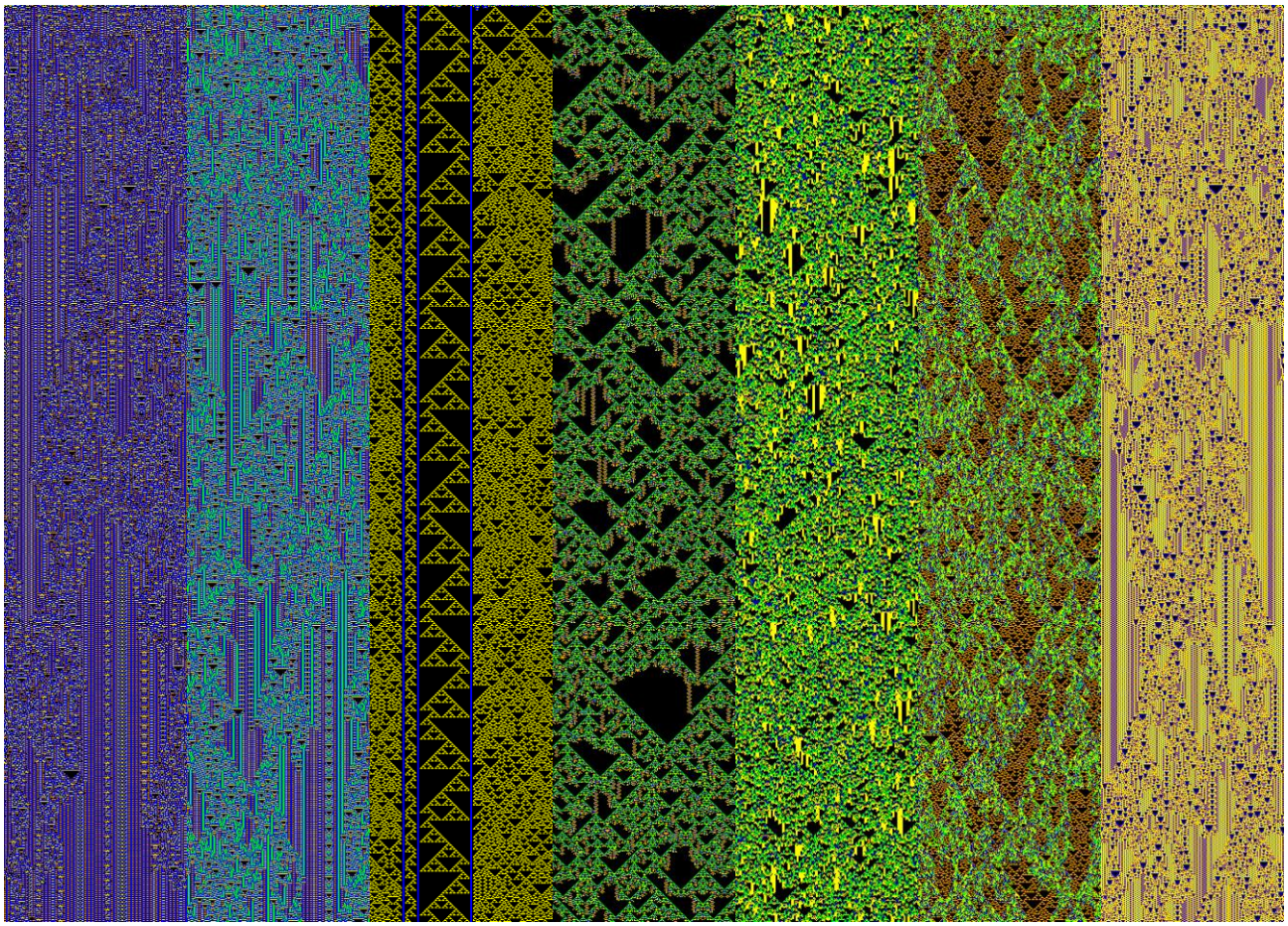
COSC 420 lab 1 report

Introduction

This lab consisted of 30 experiments of cellular automata. Each experiment generated 13 images of one-dimensional cellular automata for a total of 390 images. Of those images 48 were determined to be class IV behavior. The images below are examples of these class IV images that were my favorites.

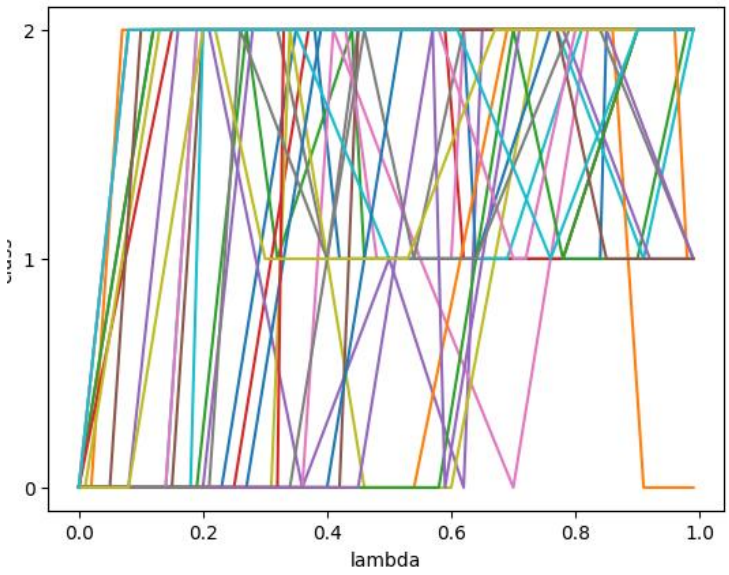


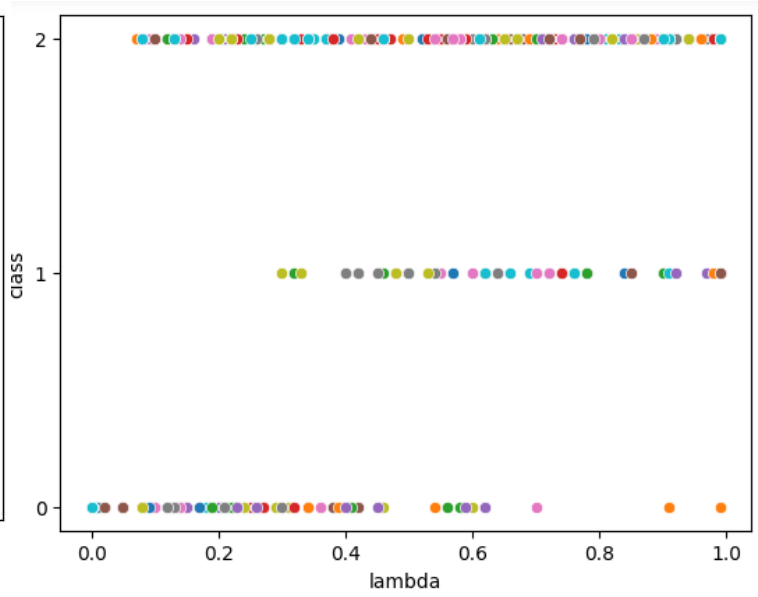
Averages and Standard Deviation

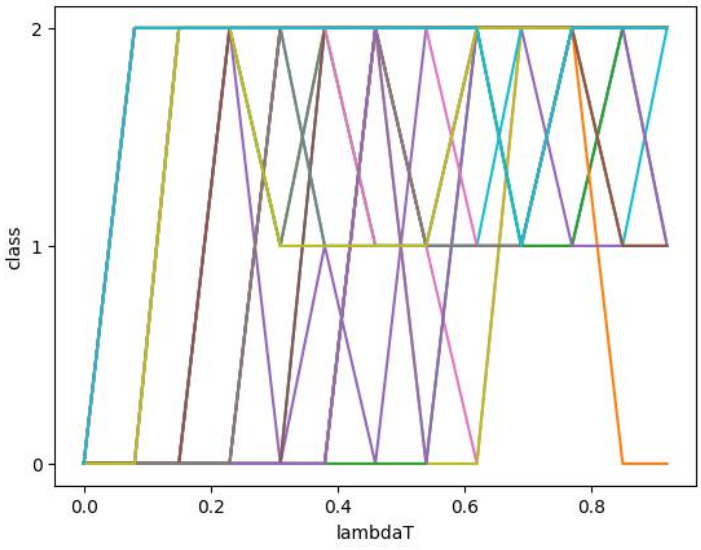
	Average	Standard Deviation
Lambda	0.665362	0.204536
LambdaT	0.620295	0.176987
H	1.825963	0.237866
HT	1.928054	0.259118

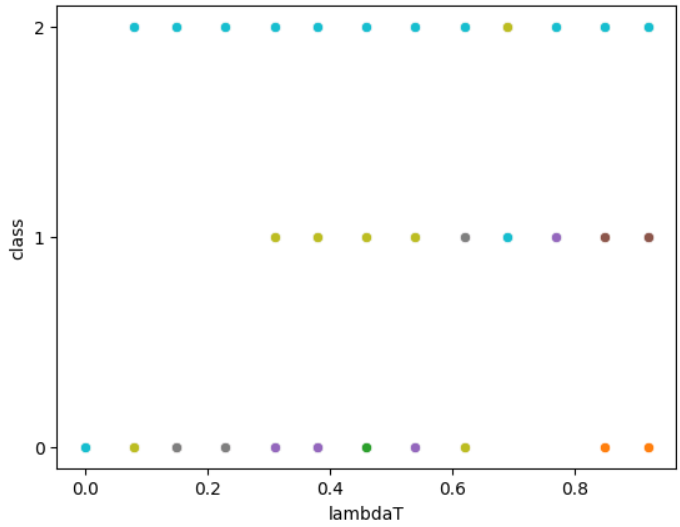
This is a table of the average values and standard deviation across all experiments that yielded class IV behavior. It seems that the Lambda-T value had the lowest standard deviation which suggests that that value had the greatest influence on class IV behavior generation.

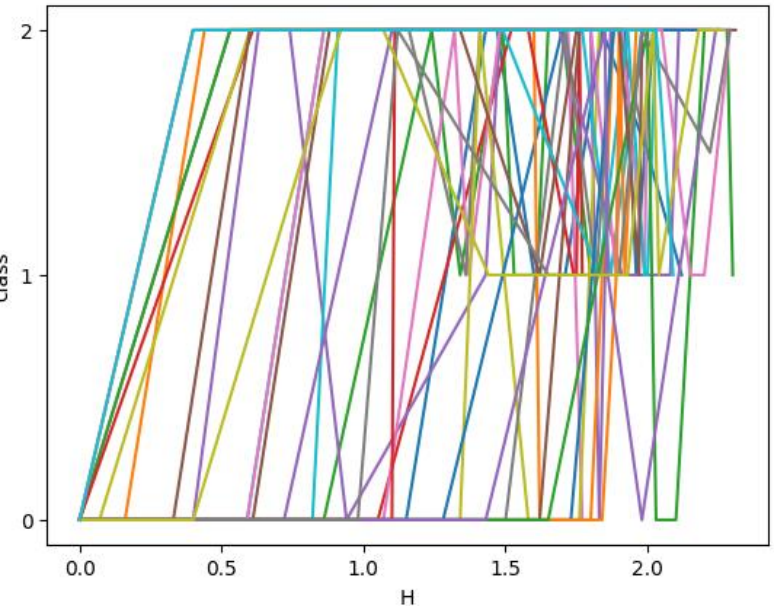
Graphs of the Behaviors

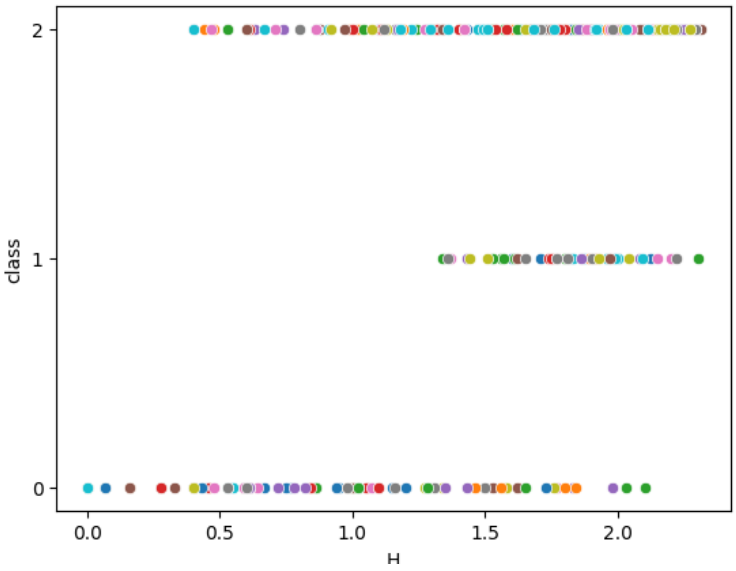


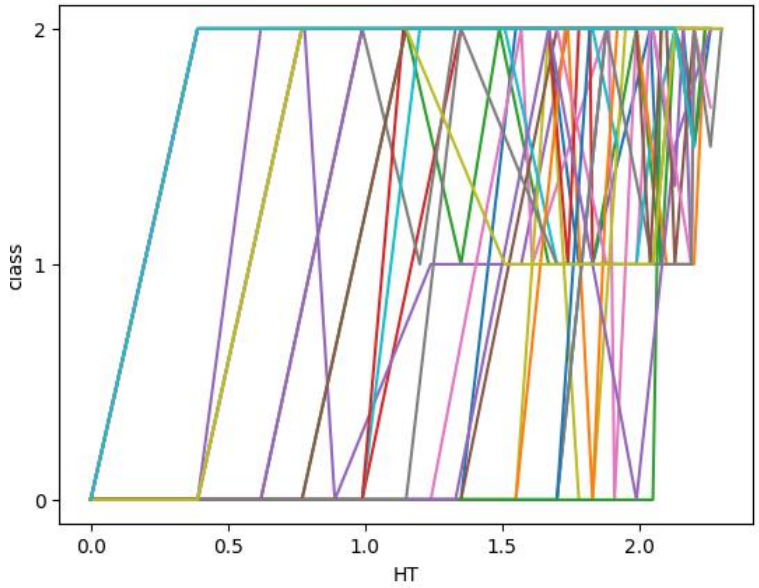


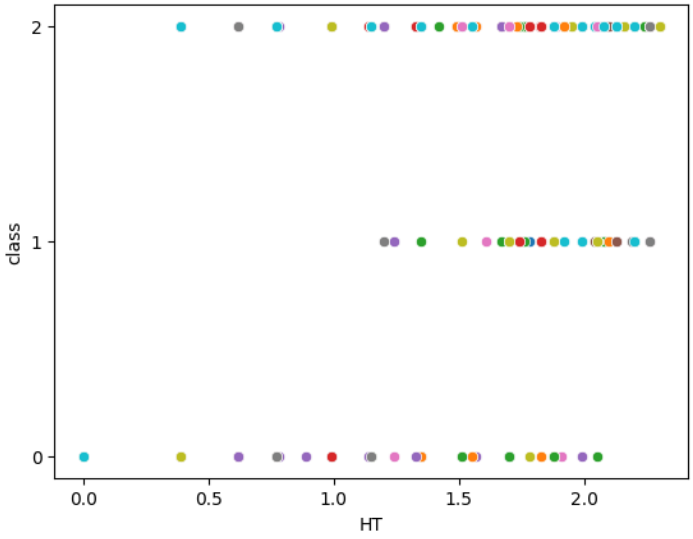












Discussion

Looking at these line and scatter-plot graphs above, patterns start to become apparent. For the Lambda and Lambda-T values you can see that class IV behavior (labeled 1) starts to generate around 0.3 and stays consistent through 0.9. However for the H and HT values you can see that class IV behavior starts to appear around 1.2 or 1.3 and is very dense from 1.5 to 2.5. In the Lambda tables I noticed some anomalies where there where a few points of class I and II behavior at higher values. There are also some class III behaviors at low values in both Lambda charts. As for the H and HT charts there are fewer anomalies as the behaviors are more densely graphed. However there are a few instances where you can see class I and II behavior beyond the 2.0 value.