EXPERIMENT Report

# EXPERIMENT

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| Report Date | Project Name | Prepared By |
| [Select Date] | [Project] |  |

# QUESTION: What do we want to figure out?

We want to determine if the column sequences of length 100 generated on keys of length 19 by Wolfram Cellular Automaton Rule 30 are statistically random enough to resist next-bit prediction by a Decision Tree Classifier built in sklearn.

# PROCESS: WHAT WILL WE DO TO ANSWER THE QUESTION?

1. Generate 1000 random bitstrings of length 19.
2. For each bitstring, generate a sequence of length 100 by evolving Wolfram CA Rule 30 for 100 generations, then collecting the entries in column 0.
3. Write the sequences to a .csv file.
4. Use 70% of the data (700 sequences) to build a Decision Tree Classifier (DCT) that can predict the 100th bit from the first 99.
5. Using the DCT that we just created, test for accuracy on the remaining 30% of the data.
6. Record the accuracy of the DCT.

# RESULTS: WHAT HAPPENED IN THE PROCESS?

We have not yet run the experiment.

# Conclusions : WHAT DID WE LEARN?

We have not yet run the experiment.

# CONJECTURES & FUTURE QUESTIONS: WHAT COMES NEXT?

We have not yet run the experiment.

# DOCUMENTATION: WHERE CAN WE SEE THE RESULTS?

We have not yet run the experiment.