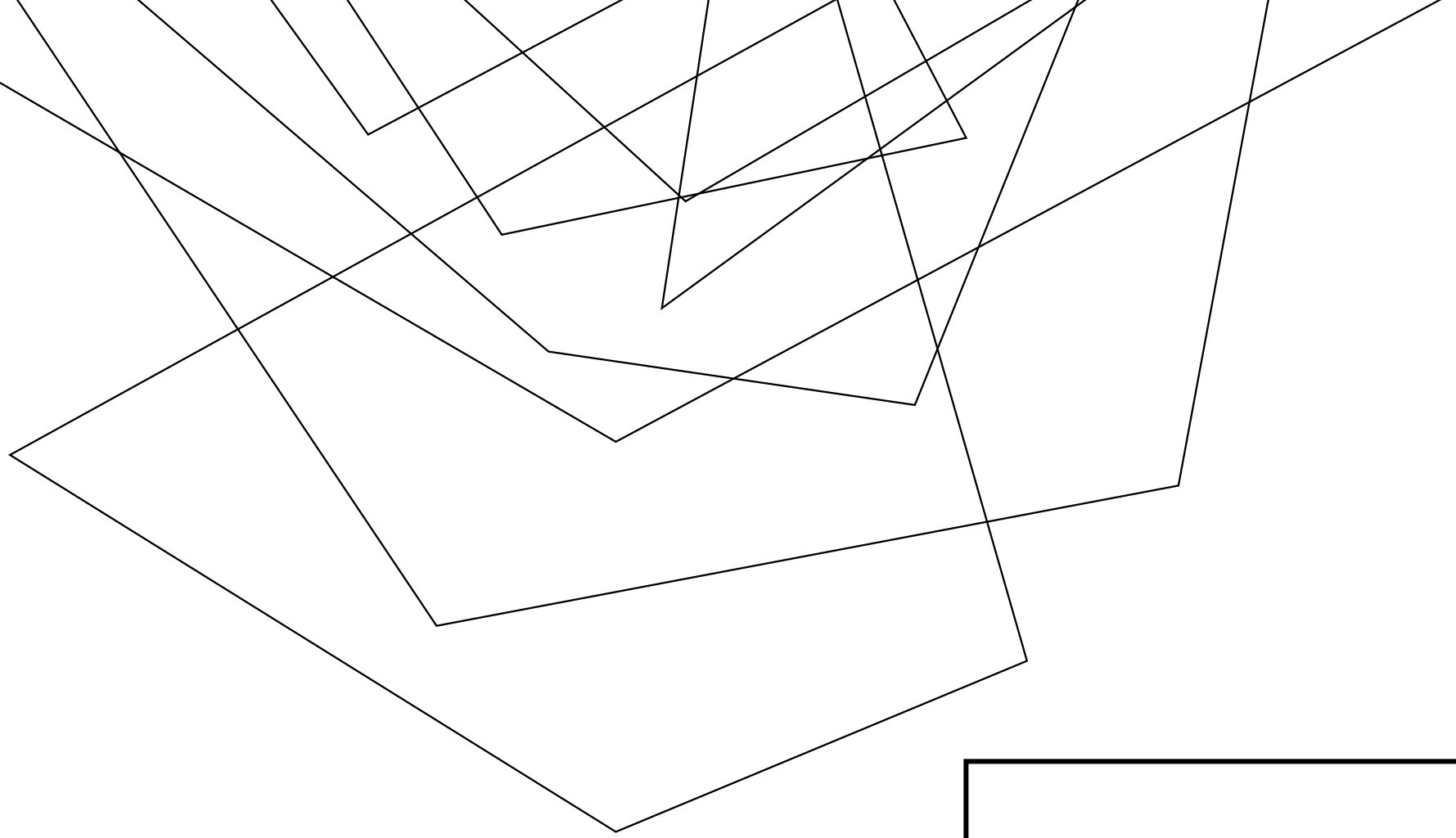

PORTFOLIO

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CONTENTS:

- Machine learning Projects.
- Complex Systems, Optimization Algorithms.
- Natural Language Processing Project.
- Industrial AI Projects.
- Neural Network basics (without built-in library functions).
- Image Processing Projects (without built-in library functions).
- Certifications.

Machine Learning projects.

Zomato_predict-rating-of-restaurants

I started with DATA CLEANING and DATA PROCESSING. Then extratreesregressor was used to EXTRACT important FEATURES. After data was ready for the model, to predict ratings, I started with the most basic regression model which is LINEAR REGRESSION. Analyzing the need for improvement in predictions from linear regression, I decided to build an unsupervised learning model before the supervised learning model. So, K MEANS CLUSTERING was built before LINEAR REGRESSION. Now, for a test point, linear regression was performed only within its identified cluster given by kmeans. This improved the performance of linear regression. In the end, the RANDOM FOREST REGRESSION model was also built on the data to compare the performance of the ENSEMBLE SYSTEM on this data set.

Prediction-of-stock-prices-time-series-analysis

The problem statement is to predict the volume-weighted average price on a particular date. In such time series problems, it is important to understand the nature of the data. The standard ML pipeline structure was followed. Data preprocessing was performed by rolling widow calculations. ARIMA estimators for python were used for prediction.

Airplane-fair-prediction

In this project, the most important and difficult task was DATA CLEANING. Handling missing values, date-time formatting, handling categorical data, and outlier detection followed by FEATURE SELECTION using sklearn. In the end, a RANDOM FOREST MODEL was built and hyper-tuned to achieve optimal performance.

Deployment of ML projects

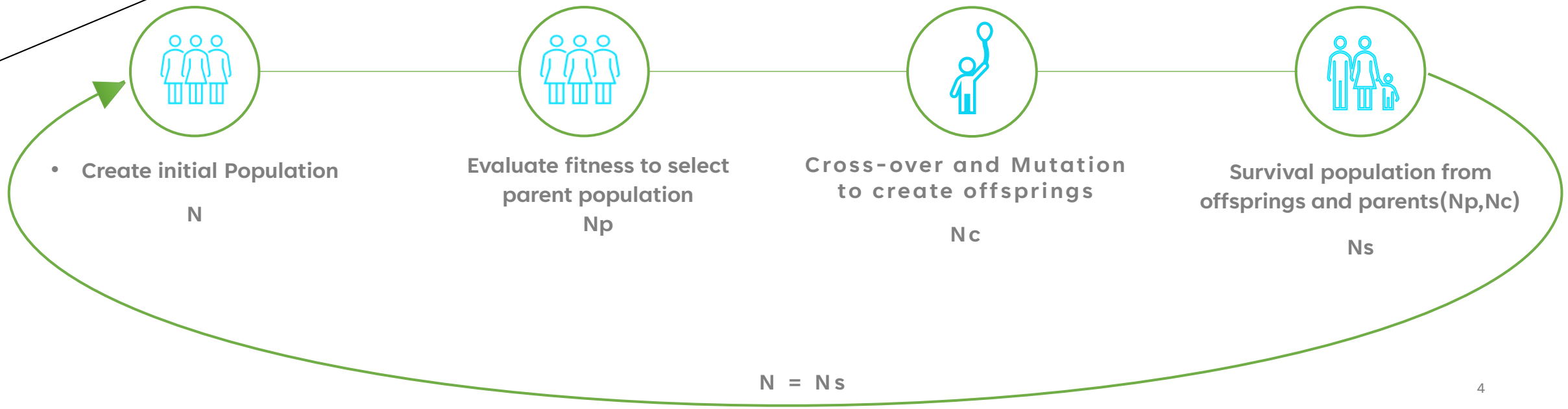
The entire process of deployment of the ML model was followed. From understanding system architecture, developing an ML model, packing model for production to deployment and integration. Containers and differential testing were also performed.

COMPLEX SYSTEMS, OPTIMIZATION ALGORITHMS.

https://github.com/vaishnavi1197/Poem-generation-with-EA/graphs/traffic

Concept: Create an ***Evolutionary Algorithm*** that writes prose in the structure of syllabic-verse poems. The goal is for the poems produced to be

- grammatically correct
- follow a syllable scheme (e.g., 5-6-6-5)
- meaningful



NATURAL LANGUAGE PROCESSING PROJECT.

- Markov Models.
- Decrypting Ciphers.
- Latent Semantic Analysis.

- Spam Detector:
  - AdaBoost
  - Naïve Bayes
- Article Spinner:
  - Trigram Model
- Sentiment Analyzer.
  - Logistic Regression
- Password-Strength-NLP :
  - Tokenization
  - Logistic Regression.

INDUSTRIAL AI PROJECTS.

- Implement the analytical tools and assess the health of the shaft in a rotor-bearing system.

  - Logistic Regression
  - SVM
  - SOM

- Semiconductor Etching Tool Health Assessment

  - PCA
  - SOM

NEURAL NETWORK BASICS (WITHOUT BUILT-IN LIBRARY FUNCTIONS).

MNIST dataset

MULTI-LAYER FEED-FORWARD NEURAL NETWORKS WITH MOMENTUM

- Created a network with user-defined hidden layers and neurons. Trained a 1-hidden layer neural network to recognize the digits by classifying them into 10 classes.

AUTOENCODER NETWORK

- The network consisted of 1 hidden layer with 100 hidden neurons. The hidden neurons learned a few numbers on which they performed best. Numbers like 4 5 1 7 were learned easily, the reason being their structure. The numbers like 2 6 9 3 were comparatively difficult to reconstruct.

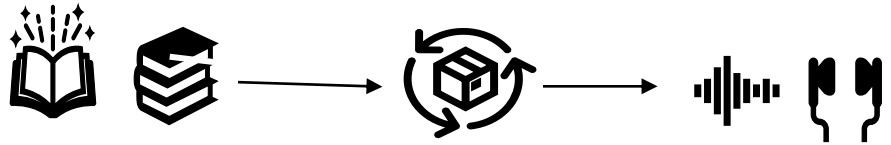
USING AUTOENCODER GENERATED WEIGHTS AND STUDYING ITS EFFECT.

- Set the input-to-hidden layer weights from the autoencoder and hidden-to-output weights randomly.
- Set the input-to-hidden layer weights from the autoencoder and hidden-to-output weights randomly, but this time train both layers of weights using backpropagation.

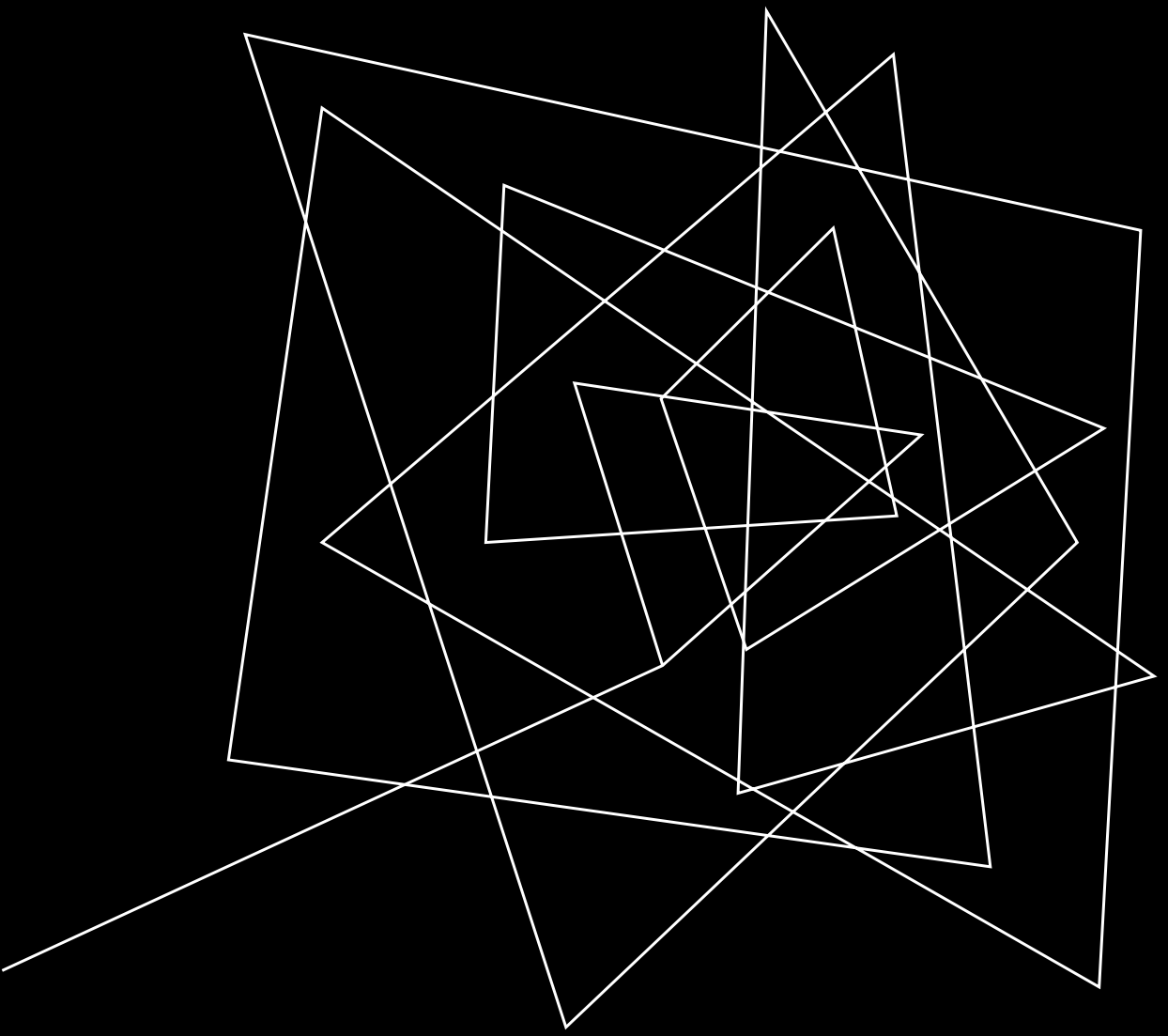
IMAGE PROCESSING PROJECTS (WITHOUT BUILT-IN LIBRARY FUNCTIONS). [MATLAB]

- EROSION DILATON AND BOUNDARY EXTRACTION.
- HISTOGRAM PROCESSING.
- FILTERING IN SPATIAL AND FREQUENCY DOMAIN.
  - HPF
  - LPF
  - ORDER-STATISTIC FILTER
  - ADAPTIVE FILTERS

- CONVERSION OF TEXT TO AUDIO FOR THE VISUALLY IMPAIRED.
  - The input to the model is an image of a document or standard pdf file, in the latter case, the input is converted to an image. With the use of text recognition, we identify the words.
  - In the second phase, I convert the text into speech which will be the output available to the user.



TEXT AUDIO



CERTIFICATIONS.

- SQL for Data Analysis - with SQL Server
- Deployment of ML models.
- Google Program Management[L3]
- Azure Repository
- NLP in python

SKILLS.

- Languages: Python, SQL, C#, Java
- Databases: Microsoft SQL Server
- Cloud Services: Azure
- Framework: .NET, Flask, Spark
- Tools: MS Excel, Tableau, Docker
- Libraries: Pandas, NumPy, Matplotlib, Seaborn, scikit-learn, TensorFlow