# Hackathon Experience: Building a Spam Email Detection System with ResNet

On February 16, 2025, I participated in an exciting hackathon where I developed a Spam Email Detection System using ResNet. This challenge involved working with a CSV dataset, performing data preprocessing, exploratory data analysis, training a deep learning model, and deploying the system successfully using Streamlit.

## Key Steps

### 1. Data Cleaning & Preprocessing

Raw data is often noisy and requires preprocessing. I handled missing values, removed duplicates, and performed text normalization techniques such as lowercasing, stopword removal, and stemming to prepare the dataset for training.

### 2. Exploratory Data Analysis (EDA)

EDA was crucial to understand the structure of the dataset. I visualized class distributions, word frequencies, and correlations to identify key patterns that could help improve model performance.

### 3. Model Training with ResNet

I implemented ResNet, a deep learning model originally designed for image classification, and adapted it for text classification. The model was trained with optimized hyperparameters to achieve high accuracy.

## Results

The final model achieved remarkable accuracy:

✅ Train Accuracy: 94.72%

✅ Test Accuracy: 94.32%

## Deployment

The trained model was successfully deployed using Streamlit, making it user-friendly and accessible for real-time spam email detection.

## Conclusion

This hackathon was a fantastic experience that tested my data science and deep learning skills. From raw data to a fully deployed model, the journey was both challenging and rewarding. The high accuracy achieved by ResNet demonstrates the potential of deep learning in spam detection.