Banknote Forgery Detection Report

# 1. Purpose of the Data Science Project

The purpose of this data science project is to explore the feasibility of using machine learning algorithms to automate the detection of forged banknotes. The project aims to provide the bank with a reliable, efficient, and cost-effective method for identifying counterfeit notes.

# 2. Description of the Data

The dataset comprises two variables, V1 and V2, each representing specific image attributes of banknotes. V1 and V2 are continuous numerical variables. The dataset contains both authentic and forged banknotes.

# 3. Methods: Data Analysis

We employed K-Means clustering, a machine learning algorithm, to segment the data into clusters. The K-Means algorithm was run multiple times to check for stability in the clustering pattern.

# 4. Summary of Results

The K-Means algorithm successfully clustered the data into distinct groups. However, the algorithm's stability across multiple runs was inconsistent, which could be a limitation in a real-world application.

# 5. Recommendations

Given the K-Means algorithm's limitations in stability, it may not be the most reliable method for banknote authentication on its own. We recommend further exploration using other machine learning algorithms and possibly incorporating more features for a more robust model.