**Purpose of the Data Science Project:**

The purpose of this Data Science Project is to produce a model that is able to detect counterfeit notes from legitimate bank notes.

**Description of the Dataset:**

The dataset represents two variables that observe 1372 instances of unique occurrences (i.e., Data shape = (1372, 2)). The variables of the dataset are Variance and Skewness being developed from the captured images of legitimate and counterfeit banknotes processed through wavelet transformation. The data is sufficiently clean and contains no missing data.

**Methods:**

To train a model that can detect counterfeit bank notes, KMeans clustering was performed to allow different instances of the two variables to group together into two different clusters. Such would allow assessing the characteristics of the instances of each cluster to gain insight of the typical combination of instances that can be classified as counterfeit and legitimate bank notes.

Multiple reiteration of the KMeans clustering of the syntax was performed test the stability of the syntax. The syntax was found to be stable only based on visual inspection. Methods such as Silhouette score and Davies-Bouldin Index could have been used to test the stability of the syntax, but was not used.

**Summary of the Result**

The syntax has successfully become able to cluster different instances of the variables in specified numbers of clusters, and shall be helpful differentiating counterfeit banknotes from legitimate banknotes. The syntax was also found to be stable based on reiteration of the syntax for 45 times. Nevertheless, the probability of the model to remain successful in detecting counterfeit notes is not assessed.

**Recommendation**

The model should be applied and relied with caution because the robustness of the model is unfounded. Additional tests using different methods may be deemed necessary to validate any claims.