This project focuses on automating the classification of various household and recyclable waste categories using deep learning:

1. Data Loading and Management: The dataset, consisting of 30 classes of household and recyclable waste images, was handled using Pythons kagglehub library.
2. Data Splitting: The dataset is divided into 80% for Training and 20% for validation to ensure balanced evaluation.
3. Model Selection: Three models were selected for comparison:
    - VGG16
    - VGG19
    - ResNet
4. Data Preprocessing:
    - Preprocessed data for the input requirements of models.
    - Trained and validated these models on the processed data.
5. Evaluation Metrics:
    - For each model, accuracy, F1 score, Recall and precision were calculated to assess model performance.
    - Confusion matrices for each model were generated to provide a detailed breakdown of classification results.

This submission includes the code, accuracy comparisons, and evaluation matrices for each model. This approach provides a comprehensive view of each model's effectiveness in classifying various household and recyclable waste accurately.

Model Accuracy Comparison / Summary

Model Name	**VGG16**	**ResNet**	**VGG19**
Accuracy	1.00	1.00	0.0357
Precision	1.00	1.00	0.0355
Recall	1.00	1.00	0.0357
F1 Score	1.00	1.00	0.0351
True Positive	3000	3000	107
False Positive	0	0	2893
True Negative	0	0	87000
False Negative	0	0	2893