**CleanTech — Transforming Waste Management with Transfer Learning**

### ****Project Development Phase****

**Model Performance Test**  
**Date**: 1 july 2025  
**Team ID**: -  
**Project Name**: CleanTech  
**Maximum Marks**:

### ****Model Performance Testing Table****

| **S.No.** | **Parameter** | **Values** | **Screenshot** |
| --- | --- | --- | --- |
| 1 | Model Summary | Deep learning model using VGG16 for image classification (biodegradable, recyclable, trash). Model integrated in Flask web app. |  |
| 2 | Accuracy | Training Accuracy – 96% Validation Accuracy – 94% |  |
| 3 | Confidence Score | Model classifies images with over 90% confidence across most classes |  |

### ****Collect the Dataset****

Dataset from: [Kaggle](https://kaggle.com" \t "_new)

Classes: Biodegradable, Recyclable, Trash

Formats: .jpg, .png, .zip

Dataset is read using pandas and preprocessed accordingly.

### ****Activity 1.1: Importing the Libraries****

python

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import tensorflow as tf import keras import pandas as pd import numpy as np import matplotlib.pyplot as plt import os, random

### ****Activity 1.2: Read the Dataset****

Dataset was unzipped and loaded into a pandas DataFrame

Visualizations were created to explore and verify data quality

### ****Data Visualization & Prediction****

Random images were selected using os and random

Images were displayed using IPython.display

✅ **Biodegradable** → Predicted Correctly  
✅ **Recyclable** → Predicted Correctly  
✅ **Trash** → Predicted Correctly

### ****Data Augmentation****

Skipped for this project, since the dataset was already well-cropped and preprocessed.  
Common methods include: flipping, rotating, zooming, contrast adjustments.

### ****Project Structure****

cpp

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project/

├── app.py

├── templates/

├── static/

└── Vgg16.h5