### ****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** | **Screenshot / Values** |
| --- | --- | --- |
| 1 | Data Rendered | Images from three categories: biodegradable, recyclable, trash |
| 2 | Data Preprocessing | Images resized, labeled, converted into pandas DataFrame |
| 3 | Utilization of Filters | Not applicable (image-based model) |
| 4 | Calculation Fields Used | Not applicable (TensorFlow/Keras handles logic) |
| 5 | Dashboard Design | Flask-based UI for predictions with image and result (3 visual outputs) |
| 6 | Story Design | Upload → Classify → Result — visualized through the web interface |

### ****📦 Collect the Dataset****

Dataset Source: Kaggle

Classes: Biodegradable, Recyclable, Trash

Format: .jpg, .png, .zip

Loaded using pandas after unzipping

### ****🔧 Activity 1.1 – Importing 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****

Formats supported: .csv, .json, .zip

Data is read using pandas and structured

### ****🖼 Data Visualization****

Used IPython.display, os, and random to show random images for:

✅ Biodegradable → Correct

✅ Recyclable → Correct

✅ Trash → Correct

### ****🔁 Data Augmentation****

Skipped since data was already processed.  
Common augmentations: flipping, rotating, brightness/contrast changes.

### ****📁 Project Structure****

cpp

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project/

├── app.py

├── templates/

├── static/

└── Vgg16.h5

### ****✅ Conclusion****

CleanTech is an AI-powered image classifier for waste management. It provides real-time predictions and helps automate smart city waste processing systems.