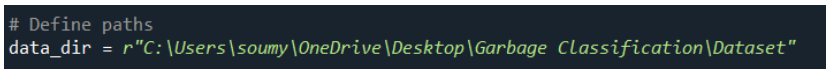
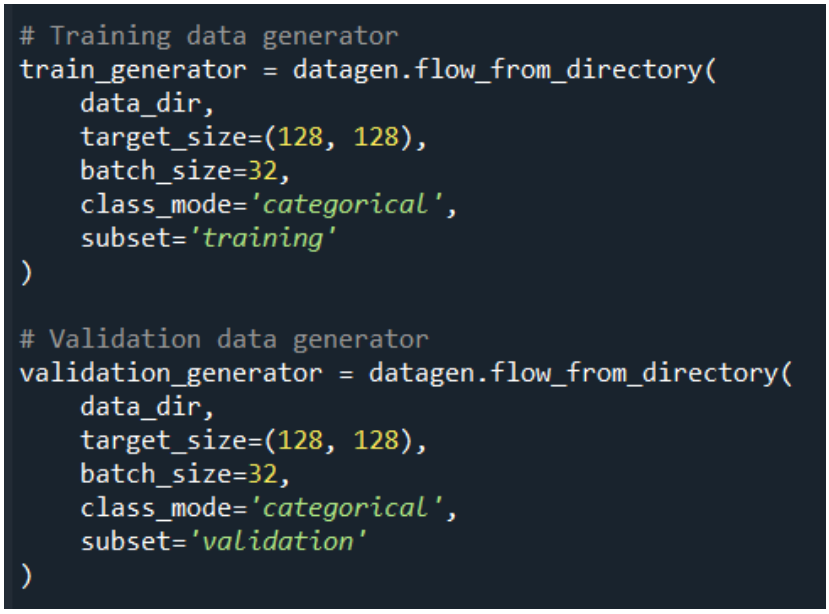
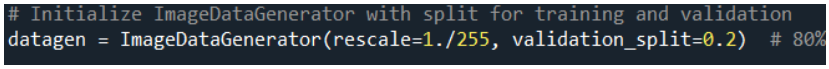
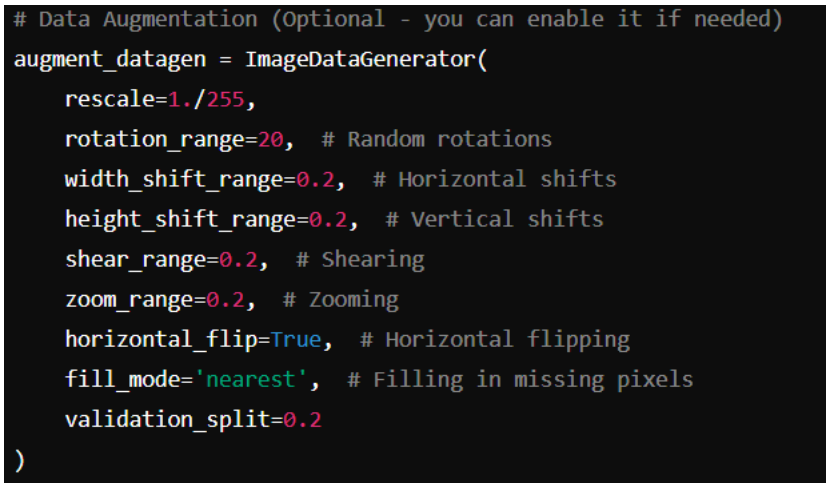
Data Collection and Preprocessing Phase

Date	1 December 2024
Team ID	740061
Project Title	Garbage Classification Using Deep Learning
Maximum Marks	6 Marks

Preprocessing Template

The images will be preprocessed by resizing, normalizing, augmenting, denoising, adjusting contrast, detecting edges, converting color space, cropping, batch normalizing, and whitening data. These steps will enhance data quality, promote model generalization, and improve convergence during neural network training, ensuring robust and efficient performance across various computer vision tasks.

Section	**Description**
Data Overview	Overview of the dataset used for garbage classification, including categories number of samples, and source of data.
Resizing	Resize images to a standard size (e.g., 224x224 pixels) to ensure uniform input for the model.
Normalization	Normalize pixel values to a range of 0 to 1 or -1 to 1 to improve model performance.
Data Augmentation	. Apply techniques such as flipping, rotation, zooming, and shifting to increase the diversity of the dataset and prevent overfitting.
Batch Normalization	Batch normalization is a technique used to improve the training of deep neural networks by normalizing the inputs of each layer.
Data Preprocessing Code Screenshots	

Loading Data	
Resizing	
Normalization	
Data Augmentation	

Batch Normalization	``` # Applying Batch Normalization x = Dense(256, activation='relu', kernel_initializer='he_uniform')(x) x = BatchNormalization()(x) # Batch normalization after dense layer x = Dropout(0.5)(x) # Dropout to prevent overfitting x = Dense(128, activation='relu', kernel_initializer='he_uniform')(x) x = BatchNormalization()(x) # Batch normalization again x = Dropout(0.5)(x) ```