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LAB 14:- Implement a pre-trained CNN using Transfer learning models.

AIM:- To implement a pre-trained CNN model as a feature extractor using transfer learning.

Pseudo Code:-

- Import necessary libraries.
- Load a pre-trained CNN model.
- Freeze all convolution layers to prevent training.
- Remove the original classification layer.
- Add a new classifier layer suitable for the custom dataset.
- Load and preprocess the dataset.
- Pass images through the pre-trained model.
- Train only the new classifier using extracted feature.
- Evaluate model performance on the test dataset.
- Display ~~Accuracy~~ accuracy & loss curves.

## Observation :-

→ The pre-trained CNN already knows how to detect low-level or mid-level features like edges or shapes.

→ By freezing the CN layers, we reuse this prior knowledge instead of training from scratch.

→ Only the final classification layer is trained, reducing training time.

→ The model converges faster & performs better.

→ ResNet performed better on complex datasets due to its residual, while VGG16 gave stable maps.

## Result :-

Successfully implemented pre-trained model as a feature extractor using Transfer learning mode.

Eq. 1

# Diagram

Custom Architecture :-

Customized VGG16

