of a Pre-Trained Model

EXP No: 13:- Understanding the Architecture

Aim:-

To study and analyze the architecture and components of pre-trained CNN models such as VGG16, ResNet 50, and Inception V3.

Objectives:-

1. To understand transfer learning using pre-trained deep learning models.
2. To explore layer structure, feature extraction, and fine-tuning techniques.
3. To visualize and analyze learned representations from pre-trained models.
4. To load and summarize model architecture in TensorFlow/ keras.

Algorithm:-

1. Import a pre-trained model with Imagenet weights
2. Load the model without top layers.
3. Display the model summary to understand architecture
4. Analyze Convolutional, pooling, and fully connected layers.
5. Use a sample image to visualize model predictions or features.

pseudo Code:-

Import pre-trained model
Load model without top layer.
Display model.summary()
visualize layers & parameters.
Run a sample image through model for prediction

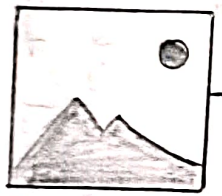
Observation:-

- VGG16 :- Deep Sequential network with 13 Convolutional + 3 dense layers.
- ResNet 50 :- Uses skip connections to avoid vanishing gradients.
- Inception V3 :- Employs parallel convolution paths for multi-scale feature extraction
- Each pre-trained model captures hierarchical image features efficiently

Conclusion:-

pre-trained models like VGG16, ResNet 50, and Inception V3 provide powerful feature extractors trained on large datasets. Understanding their architectures help apply transfer learning, improving accuracy & training efficiency in new tasks.

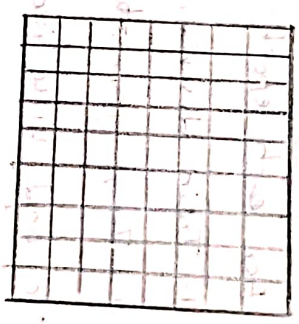
USAGE OF PRE-TRAINED ARCHITECTURE



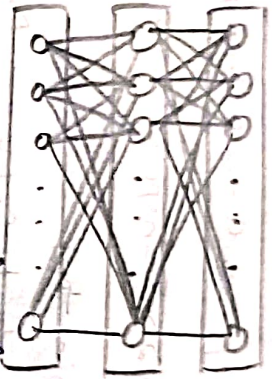
Feature extraction process

Input Image

pre trained deep learning architecture



Extracted features



Output :-

Total parameters : 13835744

Trainable parameters : 13835744

Non Trainable parameters : 0

Layers Names :

Conv0 : Conv02D

bn1 : Batch Normal 2D

relu : ReLU

maxpool : maxpool 2D

layer1 : sequential

layer2 : sequential

layer3 : sequential

layer4 : sequential

avgpool : Adaptive avg pool 2D

fc : Linear