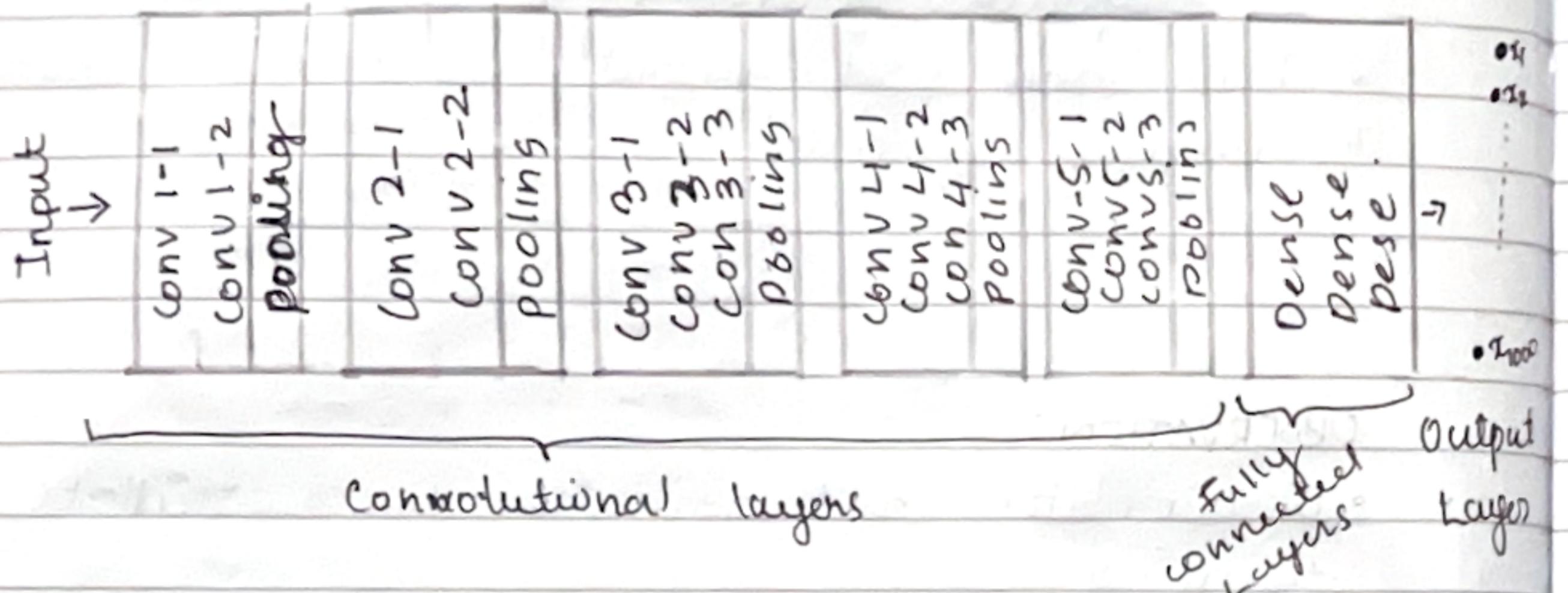
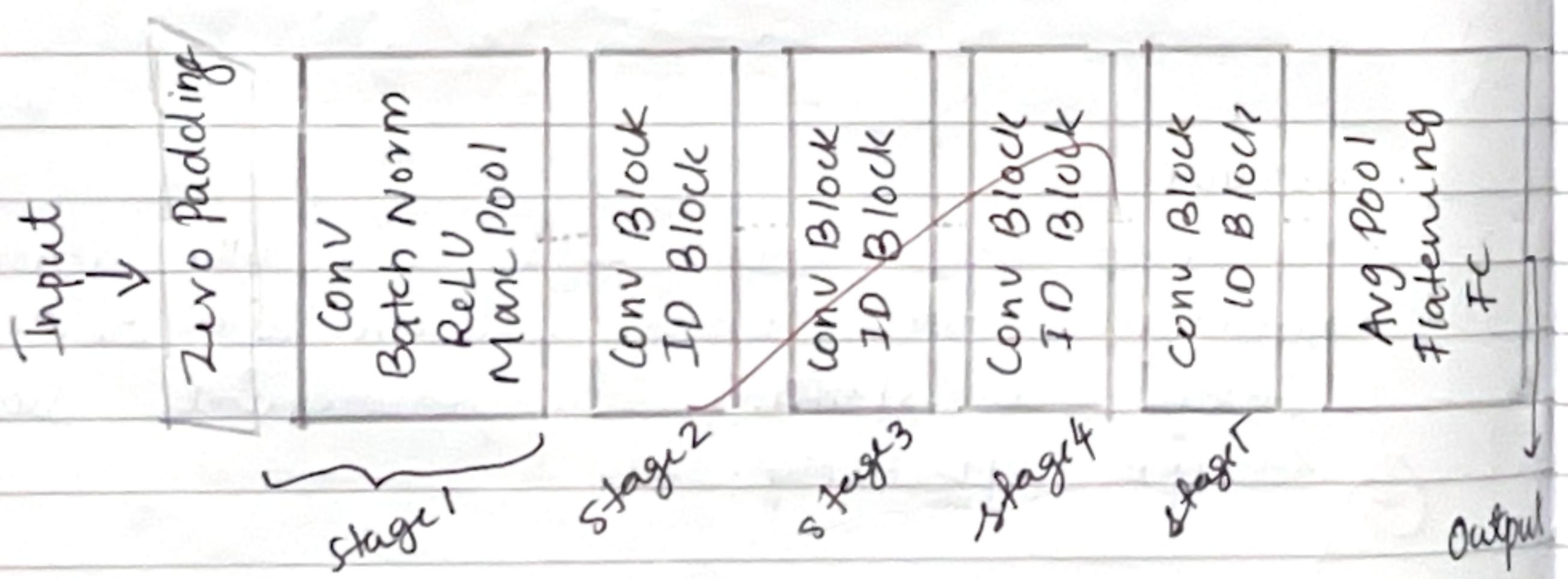


VGG16 Architecture:



ResNet 50 Architecture:



27/10/26

LAB-13

Understanding the Architecture of Pre-Trained Model.

AIM:

To study and understand the architecture, functioning and feature representation of pre-trained deep learning models such as VGG16 and ResNet50, and to visualize the internal features map extracted from Convolutional Layers.

OBJECTIVES :

- > To load and explore the architecture of pre-trained CNN models.
- > To analyze how pre-trained model extract hierarchical visual features from images.
- > To visualize feature maps from early convolutional layers
- > To interpret how deep networks understand images at different levels (edges \rightarrow textures \rightarrow objects)

VGG16: Deep CNN with 16 layers, known for its simplicity - uses small 3×3 filters stacked together

ResNet50: Residual Network with 50 layers; introduces skip connections to solve vanishing gradient problems.

Output: Top 5 predictions with probabilities

Original Input Image

Top 5 predictions (VGG16):

Golden Retriever: 89.56%

Labrador Retriever: 42%

Clumber Spaniel: 1.05%

Cocker Spaniel: 0.91%

Sussex Spaniel: 0.65%

Top 5 predictions (ResNet50):

Golden Retriever: 62.11%

Labrador Retriever: 4.04%

Tennis ball: 0.97%

Flat-coated Retriever: 0.43%

Kuvasz: 0.28%

Feature Map shape:

torch.Size([1, 64, 224, 224])

PSEUDOCODE:

1. Import required libraries
2. Download and open a color image from web
3. Apply Transformation
4. Load pretrained model: VGG16, ResNet 50
5. Set models to evaluation mode
6. Pass input image through both models
7. Get top-5 predicted classes using softmax
8. Extract first few convolutional layers from VGG16
9. Forward image through early layers to get feature maps
10. Visualize first 7s feature maps

RESULT:

- Successfully understood architecture, feature hierarchy, and interpretability of pre-trained CNNs.

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