Model Optimization and Tuning Phase Template

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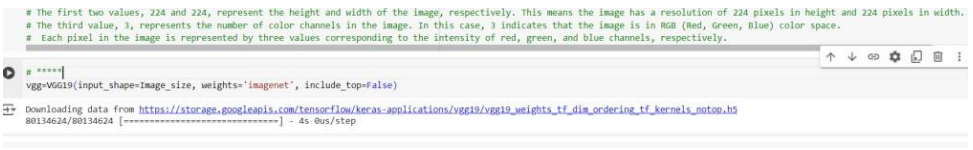
Team ID	SWTID1749740962
Project Title	Dog Breed Identification Using Transfer Learning
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining neural network models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Hyperparameter Tuning Documentation (8 Marks):

Model	Tuned Hyperparameters
VGG19	 vgg=VGG19(input_shape=Image_size, weights='imagenet', include_top=False) is part of a deep learning workflow using the VGG19 model, a popular convolutional neural network architecture. Here is an explanation of each component: 1. **VGG19**: VGG19 is a pre-trained convolutional neural network model that is 19 layers deep. It was developed by the Visual Geometry Group (VGG) at the University of Oxford. The model has been trained on the ImageNet dataset, which contains millions of images across a thousand different categories. 2. **input_shape=Image_size**: The `input_shape` parameter defines the shape of the input images expected by the model. `Image_size` is a variable (typically a tuple) that specifies the dimensions of the input images. For instance, if `Image_size = (224, 224, 3)`, it means

	that the model expects images of size 224x224 pixels with 3 color channels (RGB). 3. **weights='imagenet'**: The `weights` parameter specifies that the model should load pre-trained weights from the ImageNet dataset. These weights are derived from training the model on the large ImageNet dataset, which enables the model to recognize a wide variety of features. 4. **include_top=False**: The `include_top` parameter specifies whether to include the top (i.e., the fully connected layers) of the VGG19 model. Setting `include_top=False` means that the fully connected layers are excluded, and only the convolutional base of the model is used. This is useful when you want to use the convolutional base of VGG19 as a feature extractor and then add your own custom layers on top for a specific task, such as fine-tuning for dog breed identification.

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
VGG19	VGG-19 is a pre-trained convolutional neural network (CNN) that's used in deep learning for image classification. It's 19 layers deep, with 16 convolutional layers, 3 fully connected

	layers, 5 MaxPooling layers, and 1 SoftMax layer. VGG-19 is trained on over a million images from the ImageNet database and can classify them into 1,000 object categories.