Project Initialization and Planning Phase

Date	20/06/2025
Team ID	SWTID1749826875
Project Title	Dog Breed Identification using Transfer Learning
Maximum Marks	3 marks

Project Proposal (Proposed Solution)

The proposal report aims to build an intelligent breed classification system using transfer learning that consistently outperforms traditional methods by accurately identifying dog breeds, even among visually similar categories

Project Overview	
Objective	To develop a high-accuracy image classification system capable of identifying dog breeds, even with subtle visual differences, using transfer learning.
Scope	The system will classify dog breeds from images and be deployable for use in applications such as pet registration, veterinary support, animal shelter systems, and lost pet recovery.
Problem Statement	
Description	Accurate breed identification is challenging due to the high degree of visual similarity among breeds. This project utilizes pre-trained convolutional neural networks (e.g., ResNet, EfficientNet) fine-tuned on a curated dataset of labeled dog breed images. The goal is to enable reliable, real-time classification by learning fine-grained visual features.
Impact	**Pet owners:** Simplified registration and breed recognition. **Veterinarians:** Tailored health guidance based on breed-specific traits. **Animal shelters:** Faster breed identification for adoption/rescue. **Lost pet services:** Visual matching of found animals with missing pet databases.
Proposed Solution	
Approach	1. **Dataset Collection & Curation** (from open sources like Kaggle/Stanford Dogs)

	2. **Data Augmentation** for better generalization 3. **Transfer Learning** using models like ResNet50 or EfficientNetB0 4. **Fine-tuning** with breed-specific layers 5. **Evaluation** using metrics like accuracy, precision, and recall 6. **Deployment** via a web/mobile interface
Key Features	• High-accuracy classification of over 100 dog breeds • Fine-grained feature recognition (e.g., snout shape, coat texture) • Lightweight, fast inference for mobile/web deployment • Scalable for future addition of new breeds • API support for integration into external applications

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	e.g., T4 GPU or v2-8 TPU
Memory	RAM specifications	e.g., 8 GB
Storage	Disk space for data, models, and logs	e.g., 1 TB SSD
Software		
Frameworks	Python frameworks	e.g., Flask
Libraries	Additional libraries	e.g., tensorflow
Development Environment	IDE, version control	e.g., Jupyter Notebook, Git
Data		
Data	Source, format	e.g., Kaggle dataset, 1168 images