DATE	28-02-2026
TEAM ID	LTVIP2026TMIDS90703
PROJECT NAME	Dog breed identification using transfer learning
MAXIMUM MARKS	2 MARKS

Chapter – 2
Indentation Phase

2.1 problem statement

Dog breed identification is a challenging task due to the presence of a large number of dog breeds with subtle visual differences. Many breeds share similar physical characteristics such as fur colour, body structure, facial features, and size, making it difficult to accurately distinguish between them using traditional image processing techniques. Manual identification often requires expert knowledge and experience, and even then, it may lead to incorrect classification, especially when images are captured under varying lighting conditions, different angles, or complex backgrounds.

Traditional machine learning approaches rely heavily on handcrafted feature extraction methods such as colour histograms, edge detection, and texture analysis. These techniques require domain expertise and often fail to generalize effectively when dealing with large-scale image datasets. Furthermore, training deep neural networks from scratch demands a vast amount of labeled data and significant computational resources, which may not always be feasible in real-world applications.

Another major challenge lies in handling high intra-class similarity and inter-class variation. Intra-class similarity refers to different breeds appearing visually similar to one another, while inter-class variation refers to the same breed appearing different due to pose, age, grooming style, or lighting conditions. These variations reduce classification accuracy and increase model complexity.

By leveraging pre-trained deep learning models and fine-tuning them for dog breed classification, the project aims to provide a reliable automated solution capable of accurately predicting dog breeds from input images.