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Deep Learning Project Assignment

- Project Title:
Cat vs. Dog Image Classification Using Convolutional Neural Networks (CNN)

- Course: python and AI bootcamp

- Instructor: Ma'am Sunbal Shehzadi & Sir Talha

- Submission Date: 5 may 2025

Project Objective:

The objective of this project is to build and train a Convolutional Neural Network (CNN) model to classify images as either cat or dog using the Dogs vs. Cats dataset. This project will strengthen your skills in image classification, CNN architecture design, data preprocessing, and model evaluation.

Dataset:

Kaggle Dogs vs. Cats Dataset
(Link: https://www.kaggle.com/datasets/biaiscience/dogs-vs-cats)

Project Requirements:

1. Load and Explore Dataset

2. Data Preprocessing

3. Build CNN Model

4. Train the Model

5. Evaluate the Model

Details:

- - Load images of cats and dogs and display sample images.

- - Resize images, normalize pixel values, split into training/validation sets, and apply data augmentation.

- - Design CNN using TensorFlow/Keras with layers: convolutional, pooling, dense, dropout (optional).

- - Train model using training data; plot training and validation graphs.

- - Test and report accuracy, precision, recall, F1-score, confusion matrix.

Tools and Libraries (Recommended):

- Python

- TensorFlow / Keras

- NumPy

- Matplotlib / Seaborn

Submission Guidelines:

- Submit a Jupyter Notebook (.ipynb) or Python script (.py) with code, comments, and outputs.

- Submit a short report (3-4 pages) in PDF format covering: Introduction, Dataset description, Model architecture, Results, Conclusion.

- Deadline: 5 May 2025

- Submit via: [email, LinkedIn post, link of GitHub etc.]