**Problem Statement**

The objective of this project is to develop a Convolutional Neural Network (CNN) model capable of classifying images into multiple categories. The process involves collecting, organizing, preprocessing, and augmenting image data, followed by training, validating, and evaluating the CNN model. This system aims to automate image classification tasks, potentially useful in fields such as agriculture (e.g., identifying plant diseases), medical imaging, or other classification-driven domains.

**Pipeline**

1. **Data Collection & Data Loading**
   * Collect image data across multiple categories (e.g., Category 1, Category 2).
   * Organize the dataset into three main directories:
     + train/
     + test/
     + valid/
   * Each directory contains subfolders for each category.
2. **Dataset Organization**
   * Structure the dataset folders with images sorted into respective category folders inside train, test, and valid.
3. **Uploading and Mounting**
   * Compress (ZIP) the dataset.
   * Upload the ZIP file to Google Drive.
   * Mount Google Drive in Google Colab using Python code.
   * Unzip the dataset in the Colab environment.
4. **Image Processing & Augmentation**
   * Resize all images to a uniform dimension (e.g., 129x129).
   * Apply augmentation techniques to increase dataset variability (e.g., flipping, rotation, zooming).
   * Ensure all images, whether originally small (e.g., 100x100) or large (e.g., 400x400), are processed to the same dimensions.
5. **Model Building**
   * Develop a CNN model using a deep learning library (e.g., TensorFlow or PyTorch).
   * Train the model on the processed train data and validate on valid data.
6. **Testing & Evaluation**
   * Evaluate the model using the test dataset.
   * Measure performance metrics such as accuracy, precision, recall, and confusion matrix.