## **Project Title**

**CNN-based Food Image Recognition and Nutrient Analyzer for Diabetic Patients**

## **Objective**

To build a deep learning system that:

1. Classifies food items from images using CNNs.
2. Retrieves nutritional information for identified food.
3. Evaluates food suitability for diabetic patients based on macronutrients and glycemic impact.

## **Project Components**

### **1. Food Image Recognition**

* Use CNNs to classify food images into predefined categories (e.g., “apple”, “fried rice”, “chicken curry”).

### **2. Nutritional Mapping**

* Once classified, match each food item with nutritional data (carbs, fats, protein, GI/GL, etc.) from a database.

### **3. Diabetic Suitability Scoring**

* Calculate a score for each food based on glycemic index/load and total carbs.
* Label food as Safe, Moderate, or Avoid for diabetic individuals.

## **Dataset Details**

### **A. Food Image Dataset**

**Dataset:** Food-101

* 101 food classes, 101,000 images (1000/class)
* Pre-split into training (75%) and test (25%)

### **B. Nutritional Data**

**Sources:**

* USDA FoodData Central
* Nutritionix API
* Data fields: calories, carbohydrates, protein, fat, glycemic index, serving size

## **Tools & Frameworks**

* **Language:** Python
* **Libraries:**
  + Image Processing: OpenCV, Pillow
  + Deep Learning: TensorFlow
  + Data Handling: pandas, NumPy
  + Visualization: matplotlib, seaborn

## **Expected Output**

* Upload a food image → predicts the food category