Project Initialization and Planning Phase

Date	21-06-2025
Team ID	SWTID1749893823
Project Name	AI-Powered Nutrition Analyzer For Fitness Enthusiasts
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) report

The proposal report aims to transform loan approval using machine learning, boosting efficiency and accuracy. It tackles system inefficiencies, promising better operations, reduced risks, and happier customers. Key features include a machine learning-based credit model and real-time decision-making.

Project Overview	
Objective	To develop an AI-powered system that can analyze food images, identify food items, and predict their nutritional values to assist fitness-conscious individuals in achieving their dietary and fitness goals.
Scope	The project includes real-time food recognition through image uploads, automatic nutritional analysis using a trained deep learning model, and an easy-to-use web interface for food logging. The solution is scalable and can be extended to mobile applications, gym dashboards, or dietitian tools.
Problem Statement	
Description	Fitness-conscious individuals often find it difficult to consistently log their meals manually, which is often time-consuming and prone to errors. This makes maintaining dietary discipline challenging and impacts the progress of their health goals. Our project addresses this problem by providing a smart alternative using artificial intelligence.
Impact	The system leverages Transfer Learning and a nutrition database to recognize food from images and estimate their nutritional content. The model is trained to classify five common fruits and is linked to a CSV file that contains nutritional values. Users simply upload a food image, and the system predicts the food type and displays its nutritional facts, such as calories, protein, fat, etc.

Proposed Solution	This project has a strong impact on user experience and motivation. It simplifies the process of meal logging, encourages users to stay consistent with their diets, and promotes better health decisions. Additionally, the tool can serve as a backend for diet tracking apps, fitness platforms, or professional health services.
Approach	To build the solution, the approach involves preprocessing a dataset of fruit images and dividing it into training, validation, and test sets. A transfer learning model, such as MobileNetV2 or VGG16, is trained on this data. Once a prediction is made, the corresponding nutritional information is retrieved from a pre-existing CSV file. The entire solution is wrapped in a Flask-based web application that handles image uploads and displays the results. The app can be hosted locally or shared online using Ngrok.
Key Features	✓ Food image classification (e.g., Apple, Banana, Orange, Pineapple, Watermelon) ✓ Nutritional prediction using a structured CSV nutrition database ✓ User-friendly interface with image upload functionality ✓ Real-time prediction and nutrition display ✓ Flask backend with optional public hosting via Ngrok ✓ Easily extendable to include more food categories and advanced models

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	T4 GPU
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	scikit-learn, pandas, numpy, matplotlib, seaborn
Development Environment	IDE	Jupyter Notebook, pycharm
Data		

Data	Source, size, format	Taken from Skill Wallet, csv