

## Project Initialization and Planning Phase

Date	20 June 2025
Student Name	Hrituraj Narvekar
Project Title	GreenSnap: A Vegetable Classifier
Maximum Marks	3 Marks

### Project Proposal (Proposed Solution):

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

Project Overview	
Objective	To develop a deep learning-based image classification system capable of accurately identifying vegetable species—specifically from a diverse dataset—based on visual attributes.
Scope	This project focuses on image-based classification of vegetables using deep learning models. It covers the acquisition of image datasets, preprocessing, model training using transfer learning (e.g., MobileNetV2), and evaluation of classification accuracy. The final system will classify images into one of 15 target vegetable categories. The project is limited to these categories and assumes images are of reasonable quality .
Problem Statement	
Description	Vegetable identification is challenging and often requires expert knowledge. Mistakes can lead to nutritional misjudgments or wasted produce. A reliable classification tool would benefit home cooks, nutritionists, and farmers.
Impact	Precise vegetable classification aids nutritional planning, education, and efficient farming. An image-based system makes species recognition more accessible to all.

Proposed Solution	
Approach	The project will employ CNN-based deep learning, using transfer learning from models like MobileNetV2. The vegetable image dataset will be cleaned, augmented, then used for training and fine-tuning.
Key Features	The system uses transfer learning to train efficiently with limited data, classifying vegetables into 15 key categories. Data augmentation enhances model performance, with potential for a web-based interface.

### Resource Requirements

Resource Type	Description	Specification/Allocation
<b>Hardware</b>		
Computing Resources	CPU/GPU specifications, number of cores	1 x NVIDIA RTX 3060 GPUs
Memory	RAM specifications	16 GB RAM
Storage	Disk space for data, models, and logs	500 GB SSD
<b>Software</b>		
Frameworks	Python frameworks	Python
Libraries	Additional libraries	tensorflow
Development Environment	IDE, version control	Jupyter Notebook, Git
<b>Data</b>		
Data	Source, size, format	Kaggle, Vegetable, JPEG/PNG format, 10,000 images