**Project Initialization and Planning Phase**

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| Date | 28 November 2024 |
| Team ID | 739996 |
| Project Title | Deep Fruit Veg: Automated Fruit And Veg Identification |
| Maximum Marks | 3 Marks |

**Project Proposal (Proposed Solution) template**

* Develop a convolutional Neural Network (CNN) using a transfer learning approach (Efficient Net B3) trained on an image dataset of fruits and vegetables.
* Preprocess input images using techniques like resizing, normalization, and augmentation for better model performance.
* Deploy the model via a Flask-based web application for real-time classification and integration into end-user scenarios.

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| **Project Overview** | |
| Objective | To develop an automated system leveraging deep learning to identify and classify fruits and vegetables from images. The system aims to streamline sorting processes, enhance quality control, and enable precision agriculture. |
| Scope | The project covers the design, development, and deployment of a deep learning-based model capable of classifying fruits and vegetables. It also includes the integration of this model into practical applications for food processing plants, supermarkets, and agricultural settings. |
| **Problem Statement** | |
| Description | Traditional methods for identifying and sorting fruits and vegetables are time-consuming, labor-intensive, and error-prone. These challenges lead to inefficiencies in food processing, inconsistencies in quality control, and suboptimal agricultural management. |
| Impact | Addressing this problem will improve efficiency in food processing plants, enhance product quality and freshness in supermarkets, and provide actionable insights for farmers to optimize crop health and yiel |
| **Proposed Solution** | |
| Approach | * Develop a convolutional neural network (CNN) using a transfer learning approach (Efficient NetB3) trained on an image dataset of fruits and vegetables. * Preprocess input images using techniques like resizing, normalization, and augmentation for better model performance. * Deploy the model via a Flask-based web application for real time classification and integration into end-user scenarios. |
| Key Features | * **Automated Image Classification:** High accuracy in identifying fruits and vegetables from diverse backgrounds and lighting conditions. * **Real-time Integration:** Compatible with conveyor belt systems and mobile devices for instant analysis. * **Scalability:** Modular design to add new fruit/vegetable classes without retraining from scratch. * **Precision Agriculture Monitoring:** Ability to detect crop health and provide actionable insights using drone or ground based images. |

**Resource Requirements**

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| **Resource Type** | **Description** | **Specification/Allocation** |
| **Hardware** | | |
| Computing Resources | CPU/GPU for model training | 2 x NVIDIA V100 GPUs |
| Memory | RAM for data handling | 8 GB |
| Storage | Disk space for data, models, and logs | 1 TB SSD |
| **Software** | | |
| Frameworks | Python frameworks | Flask |
| Libraries | Additional libraries | Tensorflow, |
| Development Environment | IDE, version control | Google Collab, Git |
| **Data** | | |
| Data | Source, size, format | Kaggle dataset, 30,000 images |