Project Initialization and Planning Phase

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| Date | 29 April 2025 |
| Skillwallet ID | **SWUID20250148853** |
| Project Title | Uncovering the Hidden Treasures of the Mushroom Kingdom: A Classification Analysis |
| 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.

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| **Project Overview** | |
| Objective | To apply deep learning and computer vision techniques for the identification of wild mushroom species using a categorized image dataset, with the goal of creating an efficient classification pipeline. |
| Scope | The project involves gathering mushroom images and training a deep learning classifier to recognize three genera. It incorporates pretrained models to reduce training time and enhance accuracy, with the potential for further genus expansion in the future. |
| **Problem Statement** | |
| Description | Since misidentifying wild mushrooms can be hazardous, expert knowledge is usually needed. Developing an accessible and accurate classification tool could help foragers, researchers, and hobbyists make safer decisions. |
| Impact | Proper mushroom classification enhances ecological studies, learning, and foraging safety. An image-based approach makes species identification more widely available. |

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| **Proposed Solution** | |
| Approach | First, the mushroom image dataset will be cleaned and augmented. Then, a CNN with transfer learning (ResNet/EfficientNet) will be trained and fine-tuned for accurate classification. |
| Key Features | First, transfer learning compensates for limited training data. Next, augmentation boosts robustness for classifying three critical mushroom types. Finally, a web interface may be added for accessibility. |

**Resource Requirements**

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| **Resource Type** | **Description** | **Specification/Allocation** |
| **Hardware** | | |
| 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 |
| **Software** | | |
| Frameworks | Python frameworks | Python |
| Libraries | Additional libraries | tensorflow |
| Development Environment | IDE, version control | Jupyter Notebook, Git |
| **Data** | | |
| Data | Source, size, format | Kaggle, MushroomObserver.org, JPEG/PNG format, 10,000 images |