📄 Project: GrainPalette – A Deep Learning Odyssey in Rice Type Classification Through Transfer Learning  
🆔 Team ID: LTVIP2025TMID32428  
📅 Date: 15 February 2025

## 📋 Project Planning Phase

### Product Backlog, Sprint Schedule, and Estimation (4 Marks)

| **Sprint** | **Functional Requirement (Epic)** | **User Story Number** | **User Story / Task** | **Story Points** | **Priority** | **Team Members** |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint-1 | Registration | USN-1 | As a user, I can register for the application by entering my email and password. | 2 | High |  |
| Sprint-1 |  | USN-2 | As a user, I will receive confirmation email after registration. | 1 | High |  |
| Sprint-2 |  | USN-3 | As a user, I can register via Facebook. | 2 | Low |  |
| Sprint-1 |  | USN-4 | As a user, I can register via Gmail. | 2 | Medium |  |
| Sprint-1 | Login | USN-5 | As a user, I can log into the application using email and password. | 1 | High |  |
| Sprint-2 | Dashboard | USN-6 | As a user, I can view an interactive dashboard post-login. | 3 | High |  |
| Sprint-3 | Rice Upload | USN-7 | As a user, I can upload rice grain images for classification. | 5 | High |  |
| Sprint-3 | Data Processing | USN-8 | As a system, I can preprocess and augment uploaded data automatically. | 5 | High |  |
| Sprint-4 | Model Prediction | USN-9 | As a system, I can classify the rice grain based on trained deep learning model. | 5 | High |  |
| Sprint-4 | Result Visualization | USN-10 | As a user, I can view classification result in graphical form. | 4 | Medium |  |

### 📊 Project Tracker, Velocity & Burndown Chart (4 Marks)

| **Sprint** | **Total Story Points** | **Duration** | **Sprint Start Date** | **Sprint End Date (Planned)** | **Story Points Completed** | **Sprint Release Date (Actual)** |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint-1 | 20 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 20 | 29 Oct 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 |  |  |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 |  |  |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 |  |  |

### 📈 Velocity Calculation

Velocity (per sprint): **20 Story Points**

Duration per sprint: **6 days**

Velocity per day: **20 / 6 = 3.33 story points/day**

### 📉 Burndown Chart

A Burndown Chart visually shows the remaining work in a sprint against time.

Helps track sprint progress and pace of task completion.

Ideal for Agile monitoring in Scrum-based development.

📚 **References**:

<https://www.visual-paradigm.com/scrum/scrum-burndown-chart/>

<https://www.atlassian.com/agile/project-management>

<https://www.atlassian.com/agile/tutorials/how-to-do-scrum-with-jira-software>

<https://www.atlassian.com/agile/tutorials/epics>

<https://www.atlassian.com/agile/tutorials/sprints>

<https://www.atlassian.com/agile/project-management/estimation>

<https://www.atlassian.com/agile/tutorials/burndown-charts>

## 🔬 Project Development Phase

### Model Performance Testing (10 Marks)

📅 Date: 10 February 2025  
🆔 Team ID: LTVIP2025TMID32428

| **S.No.** | **Parameter** | **Values** | **Screenshot** |
| --- | --- | --- | --- |
| 1 | Metrics | **Classification Model:** |  |
| Confusion Matrix – [ ] |  |  |  |
| Accuracy Score – [ ] |  |  |  |
| Classification Report – [ ] |  |  |  |
| **Regression Model:** |  |  |  |
| MAE – [ ] |  |  |  |
| MSE – [ ] |  |  |  |
| RMSE – [ ] |  |  |  |
| R2 Score – [ ] | [Insert Screenshot] |  |  |
| 2 | Tune the Model | Hyperparameter Tuning – [ ] |  |
| Validation Method – [ ] | [Insert Screenshot] |  |  |

## 🧾 Project Summary Sections

### 🔍 Overview

GrainPalette is a deep learning-based rice type classification project aimed at leveraging image data and transfer learning for efficient grain identification. This project supports scalable and automated agricultural analytics.

### 🎯 Goals

Apply deep learning and transfer learning techniques for rice classification.

Enable a user-friendly application for grain image upload and result display.

Design accurate and scalable classification models to assist farmers and researchers.

### 🛠️ Specifications

Python, TensorFlow, Keras for model development.

Image data of rice grains used for training and evaluation.

Transfer learning via pre-trained CNN architectures (e.g., VGG16, ResNet50).

Confusion matrix, accuracy score, and classification reports used for validation.

### 📘 Additional Details

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### 🏁 Milestones

📅 Week 1–2: Data collection and cleaning.

📅 Week 3–4: Model design and training.

📅 Week 5: Performance tuning and visualization.

📅 Week 6: Final integration and testing.