# Ideation Phase

## Brainstorm & Idea Prioritization Template

📅 Date: 31 January 2025

👥 Team ID: LTVIP2025TMID32428

📌 Project Name: GrainPalette – A Deep Learning Odyssey in Rice Type Classification through Transfer Learning

🎯 Maximum Marks: 4 Marks

## 🧠 Brainstorm & Idea Prioritization Template

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.  
  
Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.  
  
📚 Reference: https://www.mural.co/templates/brainstorm-and-idea-prioritization

## ✅ Step-1: Team Gathering, Collaboration and Select the Problem Statement

- The team assembled to initiate the brainstorming session on the rice classification AI project.  
- Discussion began with the current challenges in rice grain classification, focusing on market impact, efficiency, and model accuracy.  
- Problem Statement Selected:  
 “To develop an accurate and efficient deep learning-based rice grain classifier using transfer learning for improving sorting and grading in agricultural industries.”

## ✅ Step-2: Brainstorm, Idea Listing and Grouping

Raw Ideas Listed:

1. Use pre-trained models like ResNet50, VGG16 for classification  
2. Focus on four main rice types: Basmati, Ponni, Sona Masoori, and Kolam  
3. Build a custom image dataset or use open-source datasets  
4. Apply data augmentation techniques to enhance model generalization  
5. Integrate explainability methods like Grad-CAM for model transparency  
6. Implement a GUI for real-time testing  
7. Compare multiple models based on accuracy, F1 score, and inference speed  
8. Create a lightweight model version for mobile or edge deployment  
9. Add feedback loop from users to continuously improve model  
10. Use cloud-based deployment (Streamlit or Flask + AWS)

Grouped by Themes:

📊 Modeling: Transfer learning, augmentation, model comparison, lightweight model  
📷 Data: Dataset preparation, rice type selection  
💡 UX/Deployment: GUI, real-time testing, cloud deployment  
🔍 Explainability: Grad-CAM, user feedback

## ✅ Step-3: Idea Prioritization

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Priority | Idea Description | Feasibility | Impact | Selected for MVP |
| High | Use ResNet50 for transfer learning | High | High | Yes |
| High | Classify four rice types with high accuracy | High | High | Yes |
| High | Apply data augmentation to improve accuracy | Medium | High | Yes |
| Medium | Implement Grad-CAM for transparency | Medium | Medium | No |
| High | Build simple GUI for real-time input | Medium | High | Yes |
| Medium | Cloud deployment via Streamlit + AWS | Medium | Medium | No |
| Low | Mobile edge deployment | Low | High | No |
| Medium | Feedback loop integration | Low | Medium | No |