Project Proposal (proposed Solution)

Date	9 July 2024
Team ID	team-740110
Project Title	Precise Coffee Quality Prediction
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

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	Develop an advanced machine learning-based system to provide precise and consistent coffee quality predictions, ensuring fair pricing, maintaining product quality, and enhancing customer satisfaction
Scope	1. **Data Collection and Preprocessing:** Gather and clean coffee sample data. 2. **Model Development:** Implement and optimize machine learning models. 3. **Validation and Testing:** Validate models with test data and pilot tests. 4. **Deployment:** Create a user-friendly interface and deploy the system. 5. **Training and Support:** Offer training and support for users. 6. **Continuous Improvement:** Collect feedback and update the system continuously.
Problem Statement	
Description	The current methods for assessing coffee quality are subjective and inconsistent, leading to unreliable quality evaluations and economic disparities in the coffee industry.
Impact	Solving this problem will ensure fair pricing for farmers, consistent product quality for roasters, and improved customer satisfaction, ultimately leading to a more reliable and profitable coffee industry.

Proposed Solution	
Approach	Utilize best model to predict coffee bean health based on provided attributes. This involves training the model on a dataset containing features such as moisture content, bean color, aroma intensity, and acidity levels. Employ cross-validation to optimize model parameters and ensure robustness.
Key Features	**Random Forest Model:** Chosen for its ability to handle complex datasets with multiple features and provide robust predictions. **Feature Importance:** Analyze feature importance to understand which attributes most significantly influence coffee bean health predictions. **Scalability:** Ensure the solution can handle varying dataset sizes and future scalability needs of the website. **Interpretability:** Provide insights into model predictions to enhance user understanding and trust in the predictions.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	e.g., 2 x NVIDIA V100 GPUs
Memory	RAM specifications	e.g., 16 GB
Storage	Disk space for data, models, and logs	e.g., 1 TB SSD
Software		
Frameworks	Python frameworks	e.g., Flask
Libraries	Additional libraries	e.g, scikit-learn, pandas, numpy,seaborn,matplotlib.pyplot.
Development Environment	IDE, version control	e.g, Google Colab
Data		
Data	Source, size, format	e.g., Kaggle dataset, ,github,10,000 images