Project Initialization and Planning Phase

Date	10 July 2024
Team ID	Team-740058
Project Title	Masterful Machines: Precise Coffee Quality Predictons Through ML
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) report

Coffee quality assessment is a critical factor in the coffee industry, influencing pricing, customer satisfaction, and market positioning. Traditional methods of quality evaluation rely heavily on human experts, which can be subjective and inconsistent. This project aims to develop a machine learning-based solution to predict coffee quality precisely, leveraging advanced data analytics to enhance the objectivity, consistency, and efficiency of the assessment process.

Project Overview	
Objective	The objective of this project is to develop a precise and objective machine learning system for predicting coffee quality, leveraging sensory analysis, chemical composition, and environmental factors. This system aims to standardize quality assessments, enhance decision-making for stakeholders, and automate the evaluation process for improved efficiency and accuracy.
Scope	This project involves collecting and preprocessing data on coffee quality, including sensory, chemical, and environmental factors, to develop and validate a predictive machine learning model. It also includes creating a user-friendly web application for stakeholders to input data and receive quality assessments. Continuous feedback and model updates will ensure ongoing accuracy and relevance
Problem Statement	
Description	Traditional coffee quality assessment is subjective and inconsistent, relying heavily on human

	expertise which can vary significantly. This variability leads to discrepancies in quality evaluations, affecting pricing, customer satisfaction, and market positioning. An objective, automated, and precise system is needed to standardize and enhance the coffee quality assessment process
Impact	Inconsistent and subjective coffee quality assessments lead to variability in pricing, diminished customer satisfaction, and market instability. An objective, automated system will ensure uniform quality standards, fostering trust among consumers and improving market dynamics. Enhanced decision-making for producers and quality control experts will ultimately elevate overall coffee quality..
Proposed Solution	
Approach	Collect and preprocess sensory, chemical, and environmental data to train and validate a machine learning model for coffee quality prediction. Develop a user-friendly web application for stakeholders to input data and receive accurate quality assessments.
Key Features	A machine learning model for accurate coffee quality prediction, integrated with a user-friendly web application for data input and detailed quality assessments

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	Systems for data processing and modeling	High-performance CPUs, GPUs (e.g., NVIDIA Tesla V100), multiple cores
Memory	RAM for data handling and model training	64GB RAM
Storage	Disk space for datasets and model outputs	SSD with at least 1TB capacity
Software		
Frameworks	Machine learning frameworks	Flask
Libraries	Data manipulation and analysis	scikit-learn, pandas, numpy, matplotlib, seaborn
Development Environment	IDE and tools for software development	spyder
Data		
Data	Source, size, format	Kaggle dataset, 614, csv UCI dataset, 690, csv